

# 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: **122012-001** Project Number: 2012-11-008  
Installation Number: 041-0037

Parent Company: Hampton Alternative Energy Products, LLC

Parent Company Address: P.O. Box 97, Brunswick, MO 65236

Installation Name: Hampton Alternative Energy Products, LLC

Installation Address: 23551 Highway 11, Triplett, MO 65286

Location Information: Chariton County, Section 9, Township 54N, Range 20W

Application for Authority to Construct was made for:  
an Ecoremedy Drying System. This review was conducted in accordance with Section (5),  
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.

**DEC - 4** 2012

EFFECTIVE DATE

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 Department's Air Pollution Control Program of the anticipated date of start up of these air contaminant sources. 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 these air contaminant sources.

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 sources(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.

|             |             |
|-------------|-------------|
| Page No.    | 3           |
| Permit No.  |             |
| Project No. | 2012-11-008 |

**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."*

Hampton Alternative Energy Products, LLC  
Chariton County, Section 9, Township 54N, Range 20W

1. Control Device Requirement-Baghouse
  - A. Hampton Alternative Energy Products, LLC shall control emissions from the drum dryer using a baghouse as specified in the permit application.
  - B. The baghouse shall be operated and maintained in accordance with the manufacturer's specifications. The baghouse 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.
  - C. Replacement filters for the baghouses shall be kept on hand at all times. 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).
  - D. Hampton Alternative Energy Products, LLC shall maintain an operating and maintenance log for the baghouses which shall include the following:
    - 1) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions; and
    - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.
2. Record Keeping and Reporting Requirements  
Hampton Alternative Energy Products, LLC shall maintain all records required by this permit for not less than five years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE  
SECTION (5) REVIEW

Project Number: 2012-11-008  
Installation ID Number: 041-0037  
Permit Number:

Hampton Alternative Energy Products, LLC  
23551 Highway 11  
Triplett, MO 65286

Complete: October 30, 2012

Parent Company:  
Hampton Alternative Energy Products, LLC  
P.O. Box 97  
Brunswick, MO 65236

Chariton County, Section 9, Township 54N, Range 20W

REVIEW SUMMARY

- Hampton Alternative Energy Products, LLC has applied for authority to construct an Ecoremedy Drying System.
- HAP emissions are not expected from the proposed equipment.
- None of the NESHAPs apply to this installation. None of the currently promulgated MACT regulations apply to the proposed equipment.
- A fabric filter is being used to control the particulate matter emissions from the equipment in this permit.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of particulate matter are conditioned below de minimis levels.
- This installation is located in Chariton 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 not performed since potential emissions of the application are below de minimis levels.
- Emissions testing are not required for the equipment.
- No Air Pollution Control Program Operating Permit is required for this installation.
- Approval of this permit is recommended with special conditions.

## INSTALLATION DESCRIPTION

Hampton Feed Lot Inc. (location of the proposed equipment) in Triplett, MO is a private company categorized under Livestock Feeding. Records indicate that it was established in 1972 and incorporated in Missouri.

No permits have been issued to Hampton Alternative Energy Products, LLC from the Air Pollution Control Program.

The following New Source Review projects have been reviewed for Hampton Alternative Energy Products, LLC from the Air Pollution Control Program.

Table 1: Project History

| Project Number | Description                            |
|----------------|--|
| 2010-11-001    | No permit required for a biogas engine |

## PROJECT DESCRIPTION

Hampton Alternative Energy Products, LLC is installing an Eco remedy Drying System to process waste material from confined animal feeding operations into energy and useable product. The system uses a gasification process to generate fuel for the drum dryer. The drum dryer maximum heat input requirement is about 2 mmBtu per hour. The material flow diagram is included as Attachment A.

## EMISSIONS/CONTROLS EVALUATION

The emission factors and control efficiencies used in this analysis were obtained from the EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Chapter 9, Section 4.

The following table provides an emissions summary for this project. Potential emissions of the application represent the potential of the new equipment, assuming continuous operation (8760 hours per year).

Table 2: Emissions Summary (tons per year)

| Pollutant         | Regulatory<br><i>De Minimis</i> Levels | Existing Potential<br>Emissions | Conditioned<br>Potential<br>Emissions of<br>the Application | New Installation<br>Conditioned<br>Potential |
|-------------------|--|---------------------------------|---|--|
| PM                | 25.0                                   | 0.54                            | 2.00  | 2.54   |
| PM <sub>10</sub>  | 15.0                                   | 0.32                            | 1.82  | 2.14   |
| PM <sub>2.5</sub> | 10.0                                   | 0.32                            | 1.09  | 1.41   |
| SO <sub>x</sub>   | 40.0                                   | 0.00                            | 3.77  | 3.77   |
| NO <sub>x</sub>   | 40.0                                   | 3.36                            | 1.80  | 5.16   |
| VOC               | 40.0                                   | 0.67                            | 0.00  | 0.67   |
| CO                | 100.0                                  | 5.04                            | 0.31  | 5.35   |

| Pollutant               | Regulatory<br><i>De Minimis</i> Levels | Existing Potential<br>Emissions | Conditioned<br>Potential<br>Emissions of<br>the Application | New Installation<br>Conditioned<br>Potential |
|-------------------------|--|---------------------------------|---|--|
| GHG (CO <sub>2</sub> e) | 75,000 / 100,000                       | 525.24 <sup>1</sup>             | 7,016   | 7,541  |
| GHG (mass)              | 0.0 / 100.0 / 250.0                    | 416.79                          | 0.31  | 5.35   |
| HAPs                    | 10.0/25.0                              | 0.0                             | 0.0   | 0.0  |

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

## PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all regulated pollutants are conditioned below de minimis levels.

## APPLICABLE REQUIREMENTS

Hampton Alternative Energy Products, LLC 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.

### GENERAL REQUIREMENTS

- *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 10-6.165

### SPECIFIC REQUIREMENTS

- *Restriction of Emission of Particulate Matter From Industrial Processes*, 10 CSR 10-6.400

<sup>1</sup> The CO<sub>2</sub>e values do not include any credit for use of biomass energy.

## STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

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Randy E. Raymond  
New Source Review Unit

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Date

### PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

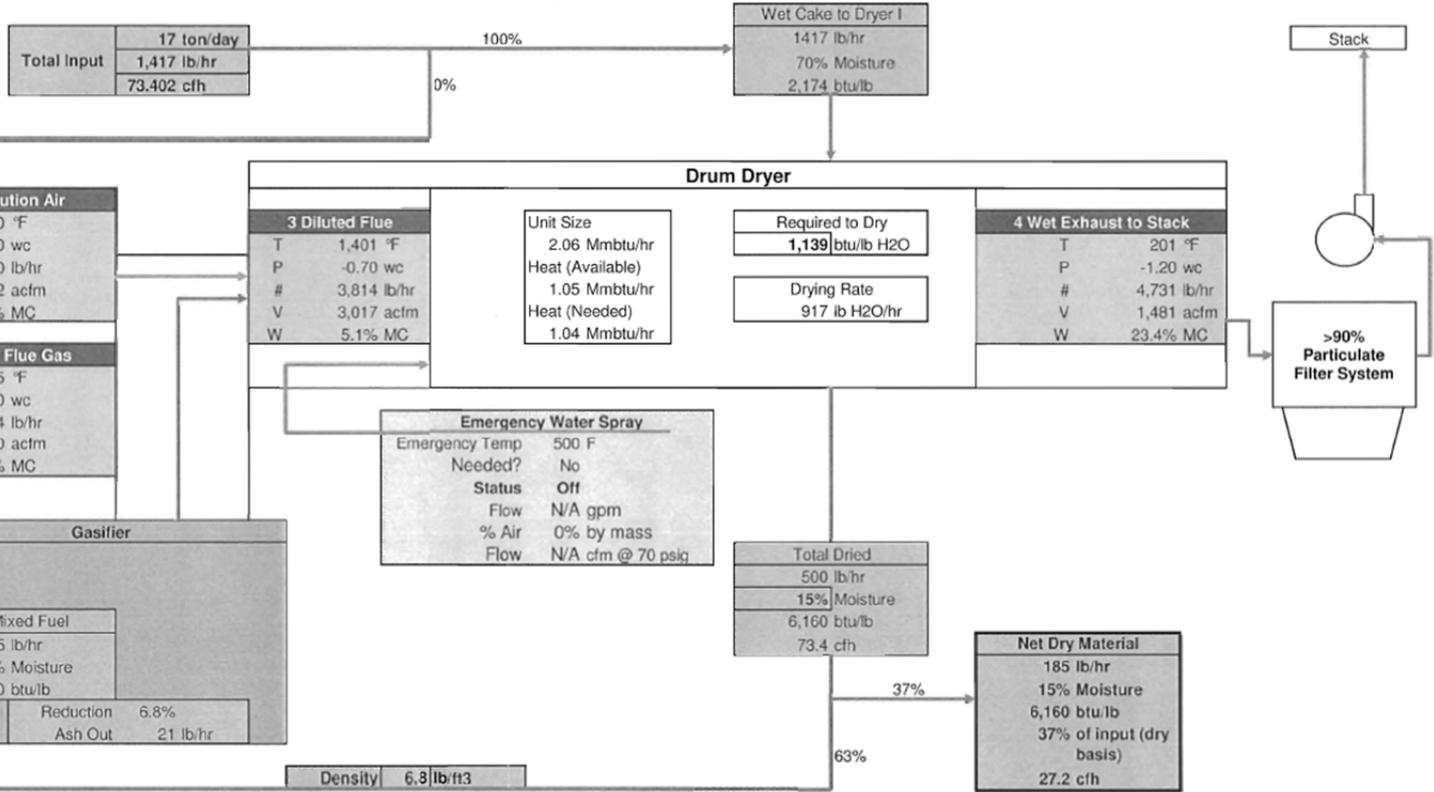
- The Application for Authority to Construct form, dated August 8, 2012, received August 9, 2012, designating Hampton Alternative Energy Products, LLC as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.



# Gasifier with Rotary Drum Dryer II

Date: Wednesday, August 08, 2012

| Conditions as Tested |       |        |
|----------------------|-------|--------|
| Energy               | 1,959 | btu/lb |
| MC                   | 73.0% |        |
| Wet Density          | 19.3  | lb/ft3 |
| Dry Density          | 3.1   | lb/ft3 |



| Gas Streams | 1      | 2      | 3      | 4      |
|-------------|--------|--------|--------|--------|
| Oxygen      | 6.97%  | 23.00% | 14.74% | 11.89% |
| CO          | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| CO2         | 16.94% | 0.05%  | 8.74%  | 7.05%  |
| Nitrogen    | 65.97% | 74.82% | 70.25% | 56.64% |
| Hydrogen    | 0.03%  | 0.00%  | 0.02%  | 0.01%  |
| Argon       | 1.11%  | 1.27%  | 1.19%  | 0.96%  |
| Water       | 8.99%  | 0.87%  | 5.05%  | 23.45% |

All elemental stream data on a % wt basis

## Design Case rev2



August 24, 2012

Ms. Kathy Kolb  
Missouri Department of Natural Resources  
Ph: (573) 526-2031

Re: Request for NO PERMIT Ruling for Ecoremedy® Dryer System

Dear Ms. Kolb:

I wish to request a NO PERMIT ruling for the Ecoremedy® Drying System to be located at Hampton Feed lot in Triplett, MO.

The total firing rate of the gasifier needed to dry the wet digestate is 2 MMBtu/hr which will produce air emissions well below the De Minimis limits and rates. Per our conversation this morning, I referenced AP-42, 5<sup>th</sup> Edition, Volume 1, Chapter 9, Section 4: "Food and Agricultural Industries" for emission factors to be used in calculating the expected emissions from the proposed system to find the note below (excerpted from the AP-42 database):

**9.4 Livestock & Poultry Feed Operations**

At this time, there is no "AP-42 factor" or estimation method for this category. As would be the case even if there were an AP-42 method, users must evaluate their own application to determine the most appropriate method of estimating emissions. In the case of permits, sources are expected to use "best available data",

To predict the emission levels from the proposed system, we used actual emission values for fuels with similar chemical and physical properties to the digestate fuel of the proposed plant as "best available data" as emission factors for AP-42 estimates. An ultimate analysis of the digestate is also attached.

| Pollutant | Emission rate (lbs/hr) | Total emissions (TPY) |
|-----------|------------------------|-----------------------|
| PM        | 0.46                   | 2.0                   |
| PM-10     | 0.42                   | 1.82                  |
| PM-2.5    | 0.25                   | 1.09                  |

## Attachment B

| Pollutant  | Emission rate<br>(lbs/hr) | Total emissions<br>(TPY) |
|--|---------------------------|--------------------------|
| NOx  | 0.41                      | 1.80                     |
| SOx  | 0.86                      | 3.77                     |
| CO   | 0.07                      | 0.31                     |
| HAPS   | 0                         | 0                        |
| All results are well below De Minimis levels for the state of Missouri |                           |                          |

Please contact me with any comments or questions pertaining to our request for no permit.

Very best regards;



David E. Mooney

President

Enginuity Energy, LLC

## APPENDIX A

### Abbreviations and Acronyms

|                               |  |                               |  |
|-------------------------------|--|-------------------------------|--|
| <b>%</b> .....                | percent                                | <b>m/s</b> .....              | meters per second  |
| <b>°F</b> .....               | degrees Fahrenheit                     | <b>Mgal</b> .....             | 1,000 gallons  |
| <b>acfm</b> .....             | actual cubic feet per minute           | <b>MW</b> .....               | megawatt   |
| <b>BACT</b> .....             | Best Available Control Technology      | <b>MHDR</b> .....             | maximum hourly design rate                                       |
| <b>BMPs</b> .....             | Best Management Practices              | <b>MMBtu</b> ....             | Million British thermal units                                    |
| <b>Btu</b> .....              | British thermal unit                   | <b>MMCF</b> .....             | million cubic feet   |
| <b>CAM</b> .....              | Compliance Assurance Monitoring        | <b>MSDS</b> .....             | Material Safety Data Sheet                                       |
| <b>CAS</b> .....              | Chemical Abstracts Service             | <b>NAAQS</b> ...              | National Ambient Air Quality Standards                           |
| <b>CEMS</b> .....             | Continuous Emission Monitor System     | <b>NESHAPs</b>                |  |
| <b>CFR</b> .....              | Code of Federal Regulations            | .....                         | National Emissions Standards for Hazardous Air Pollutants        |
| <b>CO</b> .....               | carbon monoxide                        | <b>NO<sub>x</sub></b> .....   | nitrogen oxides  |
| <b>CO<sub>2</sub></b> .....   | carbon dioxide                         | <b>NSPS</b> .....             | New Source Performance Standards                                 |
| <b>CO<sub>2e</sub></b> .....  | carbon dioxide equivalent              | <b>NSR</b> .....              | New Source Review  |
| <b>COMS</b> .....             | Continuous Opacity Monitoring System   | <b>PM</b> .....               | particulate matter   |
| <b>CSR</b> .....              | Code of State Regulations              | <b>PM<sub>2.5</sub></b> ..... | particulate matter less than 2.5 microns in aerodynamic diameter |
| <b>dscf</b> .....             | dry standard cubic feet                | <b>PM<sub>10</sub></b> .....  | particulate matter less than 10 microns in aerodynamic diameter  |
| <b>EQ</b> .....               | Emission Inventory Questionnaire       | <b>ppm</b> .....              | parts per million  |
| <b>EP</b> .....               | Emission Point                         | <b>PSD</b> .....              | Prevention of Significant Deterioration                          |
| <b>EPA</b> .....              | Environmental Protection Agency        | <b>PTE</b> .....              | potential to emit  |
| <b>EU</b> .....               | Emission Unit                          | <b>RACT</b> .....             | Reasonable Available Control Technology                          |
| <b>fps</b> .....              | feet per second                        | <b>RAL</b> .....              | Risk Assessment Level  |
| <b>ft</b> .....               | feet                                   | <b>SCC</b> .....              | Source Classification Code                                       |
| <b>GACT</b> .....             | Generally Available Control Technology | <b>scfm</b> .....             | standard cubic feet per minute                                   |
| <b>GHG</b> .....              | Greenhouse Gas                         | <b>SIC</b> .....              | Standard Industrial Classification                               |
| <b>gpm</b> .....              | gallons per minute                     | <b>SIP</b> .....              | State Implementation Plan  |
| <b>gr</b> .....               | grains                                 | <b>SMAL</b> .....             | Screening Model Action Levels                                    |
| <b>GWP</b> .....              | Global Warming Potential               | <b>SO<sub>x</sub></b> .....   | sulfur oxides  |
| <b>HAP</b> .....              | Hazardous Air Pollutant                | <b>SO<sub>2</sub></b> .....   | sulfur dioxide   |
| <b>hr</b> .....               | hour                                   | <b>tph</b> .....              | tons per hour  |
| <b>hp</b> .....               | horsepower                             | <b>tpy</b> .....              | tons per year  |
| <b>lb</b> .....               | pound                                  | <b>VMT</b> .....              | vehicle miles traveled   |
| <b>lbs/hr</b> .....           | pounds per hour                        | <b>VOC</b> .....              | Volatile Organic Compound  |
| <b>MACT</b> .....             | Maximum Achievable Control Technology  |                               |  |
| <b>µg/m<sup>3</sup></b> ..... | micrograms per cubic meter             |                               |  |

Mr. James A. Daniels  
President  
Hampton Alternative Energy Products, LLC  
P.O. Box 97  
Brunswick, MO 65236

RE: New Source Review Permit - Project Number: 2012-11-008

Dear Mr. Daniels:

Enclosed with this letter is your permit to construct. Please study it carefully and refer to Appendix A for a list of common abbreviations and acronyms used in the permit. Also, note the special conditions, if any, on the accompanying pages. The document entitled, "Review of Application for Authority to Construct," is part of the permit and should be kept with this permit in your files. Operation in accordance with these conditions, your new source review permit application and with your amended operating permit is necessary for continued compliance. The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri.

If you have any questions regarding this permit, please do not hesitate to contact Randy E. Raymond, at the Department of Natural Resources' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or at (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Susan Heckenkamp  
New Source Review Unit Chief

SH:rrl

Enclosures

c: Northeast Regional Office  
PAMS File: 2012-11-008

Permit Number: