



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Western Regional Office • 436 Dwight Street, Springfield MA 01103 • 413-784-1100

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March 6, 2012

Thomas Leue
Northeast Biodiesel Company, LLC
324 Wells Street
Greenfield, Massachusetts 01301

Re: Greenfield
Transmittal No.: X238573
Application No.: 1-P-11-021
Class: SUBMIN
FMF No.: 439424
AIR QUALITY PLAN APPROVAL

Dear Mr. Leue:

The Massachusetts Department of Environmental Protection (“MassDEP”), Bureau of Waste Prevention, has reviewed your Limited Plan Application (“Application”) listed above. This Application concerns the proposed construction and operation of a biodiesel manufacturing facility at your Northeast Biodiesel Company, LLC facility located at 179 Silvio Conte Drive in Greenfield, Massachusetts 01301.

This Application was submitted in accordance with 310 CMR 7.02 Plan Approval and Emission Limitations as contained in 310 CMR 7.00 “Air Pollution Control,” regulations adopted by MassDEP pursuant to the authority granted by Massachusetts General Laws, Chapter 111, Section 142 A-J, Chapter 21C, Section 4 and 6, and Chapter 21E, Section 6. MassDEP’s review of your Application has been limited to air pollution control regulation compliance and does not relieve you of the obligation to comply with any other regulatory requirements.

MassDEP has determined that the Application is administratively and technically complete and that the Application is in conformance with the Air Pollution Control regulations and current air pollution control engineering practice, and hereby grants this **Plan Approval** for said Application, as submitted, subject to the conditions listed below.

Please review the entire Plan Approval, as it stipulates the conditions with which the Facility owner / operator (“Permittee”) must comply in order for the Facility to be operated in compliance with this Plan Approval.

1. DESCRIPTION OF FACILITY AND APPLICATION

The MassDEP received, on January 13, 2012, an administratively complete LPA for the construction and operation of a new biodiesel manufacturing facility at the Northeast Biodiesel Company, LLC located in Greenfield. A previous plan approval #1-P-07-014 was issued for the construction and operation of a biodiesel manufacturing facility at this same location but it was never constructed.

The proposed facility will manufacture up to 3,500,000 gallons per year of biodiesel. Biodiesel is a fuel produced from a chemical reaction between a vegetable oil or animal fat, an alcohol source and a catalyst. The chemical reaction used at this facility is transesterification. This is where the triglyceride molecules contained in the vegetable oils or animal fats react with the alcohol and catalyst to produce methyl esters (biodiesel), glycerin, some alcohol and some unprocessed waste fat. The air contaminant emissions from the process and some storage tanks (methanol, glycerin, sodium methylate, and biodiesel tank) will consist of methanol which is a volatile organic compound as well as a hazardous air pollutant.

The proposed biodiesel manufacturing facility will include the following equipment:

- Vegetable oil or tallow aboveground storage tank(s)
- 9,998 gallon aboveground methanol storage tank
- 8,000 gallon aboveground glycerin storage tank
- 8,000 gallon aboveground sodium methylate storage tank
- 50,000 gallon aboveground biodiesel storage tank
- Green Fuels FuelMatic Biodiesel Processor Unit #1
- Green Fuels FuelMatic Biodiesel Processor Unit #2

Each of the Green Fuels FuelMatic Biodiesel Processor Units will consist of the following equipment:

- 69.56 gallon aboveground SRS pretreat module (water and methyl alcohol) storage tank
- 600 liter Reactor #1
- 600 liter Reactor #2
- 232.45 gallon glycerol separator
- 1,273.01 gallon buffer tank
- Four- purification columns
- 251.8 gallon methanol removal vessel (flash drum)
- Condenser
- Condenser Diffuser
- Methanol collection vessel

The proposed biodiesel manufacturing process will use methanol, sodium methylate in 25% or 30% solution (catalyst) and vegetable oil (or tallow). For some feedstocks, a mixture of water and methyl alcohol will be used from the SRS pretreat module. The methanol, sodium methylate, vegetable oil and pretreat mixture, if used, will be mixed together in one of the two reactor tanks (Reactor #1 or Reactor #2) for approximately 0.5 hours. During this mixing, the transesterification will occur and result in a mixture of 85% biodiesel, 15% crude glycerol and a small percent of

methanol. The reactor contents will then be pumped into the 232.45 gallon glycerol separator. The separator will remove the 15% crude glycerol liquid out the bottom and apply a slight vacuum to remove any methanol vapor out the top through an air ejector. Next the 85% biodiesel will be pumped to the 1,273.01 electric heated buffer tank. The buffer tank will also have an air ejector to collect methanol vapor. From the buffer tank the biodiesel will be pumped through four purification vessels to remove soap and other impurities. The biodiesel will then be pumped into the 251.8 gallon electric heated methanol removal vessel which is also called the flash drum tank. The flash drum tank level will be monitored by a level sensor. An air ejector will remove methanol vapor from the flash drum tank and the finished biodiesel will be pumped to the 50,000 gallon biodiesel tank.

The methanol vapor emitted through the air ejectors of the glycerol separator, the buffer tank and the flash drum tank will be transferred to a common condenser, also known as an air cooled heat exchanger. The heat exchanger will conservatively condense 95% of the methanol vapor into liquid for transfer into a methanol collection vessel for re-use in the process. The condensed methanol never leaves the processor unit. A condenser diffuser will be installed downstream of the condenser to minimize any remaining methanol vapor from escaping to the atmosphere. A spark arrestor will be installed at the top of the condenser's air vent for safety purposes. Based on a maximum annual production of 3,500,000 gallons of biodiesel and condensing 95% of the methanol vapor using a heat exchanger, the Green Fuels FuelMatic Biodiesel Processor Units will emit a combined annual total of 0.41 tons of VOCs and HAPs. Therefore, each individual Green Fuels FuelMatic Biodiesel Processor Unit will be limited to 0.205 tons of VOCs and HAPs in any 12 consecutive month period and a maximum annual production of 1,750,000 gallons of biodiesel. The total facility, including the methanol, glycerin, sodium methylate and biodiesel storage tanks, will emit 0.78 tons of VOCs and HAPs.

The use of a condenser and diffuser to minimize the VOC and HAP emissions from the Green Fuels FuelMatic Biodiesel Processor Units will be considered part of BACT in establishing the emission limits contained in Table 2 herein. The temperature of the inlet air to the condenser will be continuously monitored at the fan air inlet location with a thermocouple. The required inlet air temperature will be 30 degrees Celsius or less. A daily operational inspection will be conducted on the condenser fins and fan blades.

Northeast Biodiesel has proposed to install a flow meter which is capable of continuously monitoring the consumption of methanol by each processor unit. The methanol usage will be manually recorded once per shift.

Biodiesel produced for sale must meet the American Society for Testing and Materials (ASTM) standards to be sold into the marketplace.

2. EMISSION UNIT (EU) IDENTIFICATION

Each Emission Unit (EU) identified in Table 1 is subject to and regulated by the Plan Approval:

Table 1			
EU#	Description	Design Capacity	Pollution Control Device (PCD)
1	Green Fuels FuelMatic Biodiesel Processor Unit #1	1,750,000 gallons per year	Condenser and Condenser Diffuser
2	Green Fuels FuelMatic Biodiesel Processor Unit #2	1,750,000 gallons per year	Condenser and Condenser Diffuser
3	Aboveground Methanol Storage Tank	9,998 gallon	None
4	Aboveground Glycerin Storage Tank	8,000 gallon	None
5	Aboveground Sodium Methylate Storage Tank	8,000 gallon	None
6	Aboveground Biodiesel Storage Tank	50,000 gallon	None

Table 1 Key:

EU# = Emission Unit Number
 PCD = Pollution Control Device

3. APPLICABLE REQUIREMENTS

A. OPERATIONAL, PRODUCTION AND EMISSION LIMITS

The Permittee is subject to, and shall not exceed the Operational, Production, and Emission Limits as contained in Table 2, below:

Table 2			
EU#	Operational / Production Limit	Air Contaminant	Emission Limit
1	1. 1,750,000 gallons of biodiesel produced in any 12 consecutive month period	VOC/Total HAPs	0.205 tons in any 12 consecutive month period
2	2. 1,750,000 gallons of biodiesel produced in any 12 consecutive month period	VOC/ Total HAPs	0.205 tons in any 12 consecutive month period

Table 2			
EU#	Operational / Production Limit	Air Contaminant	Emission Limit
Facility-Wide	3. 3,500,000 gallons of biodiesel produced in any 12 consecutive month period	VOC/ Total HAPs	0.78 tons in any 12 consecutive month period

Table 2 Key:

EU# = Emission Unit Number

VOC = Volatile Organic Compounds

Total HAPs= Total Hazardous Air Pollutants.

B. COMPLIANCE DEMONSTRATION

The Permittee is subject to, and shall comply with, the monitoring, testing, recordkeeping and reporting requirements as contained in Tables 3, 4 and 5 below :

Table 3	
EU#	Monitoring and Testing Requirements
1, 2	1. The permittee shall monitor the amount of biodiesel produced during each month and in each 12 consecutive month period.
	2. The permittee shall install instrumentation which is capable of continuously monitoring the consumption of methanol by EU1 and EU2.
	3. The permittee shall install instrumentation which is capable of continuously monitoring the temperature of the inlet air to each condenser associated with EU1 and EU2.
3,4,5,6	4. The permittee shall monitor the amount of throughput for each storage tank during each month and in each 12 consecutive month period.
Facility-wide	5. If and when MassDEP requires it, the Permittee shall conduct emission testing in accordance with USEPA Reference Test Methods and regulation 310 CMR 7.13.

Table 3 Key:

EU# = Emission Unit Number

Table 4	
EU#	Recordkeeping Requirements
1, 2	1. The permittee shall record the amount of biodiesel produced during each month and in each 12 consecutive month period.
	2. Once per shift the permittee shall manually record the amount of methanol consumed by EU1 and EU2.

Table 4	
EU#	Recordkeeping Requirements
	3. The permittee shall continuously record the temperature of the inlet air to each condenser associated with EU1 and EU2.
3,4,5,6	4. The permittee shall record the dimensions and capacity of each storage vessel.
	5. The permittee shall record the identity of the stored material and the amount of throughput, in units of gallons, for each storage tank during each month and in each 12 consecutive month period.
Facility-wide	6. The Permittee shall maintain adequate records on-site to demonstrate compliance with all operational, production, and emission limits contained in Table 2 above. Records shall also include the actual emissions of air contaminant(s) emitted for each calendar month and for each consecutive twelve month period (current month plus prior eleven months). These records shall be compiled no later than the 15 th day following each month. An electronic version of the MassDEP approved record keeping form, in Microsoft Excel format, can be downloaded at http://www.mass.gov/dep/air/approvals/aqforms.htm#report .
	7. The Permittee shall maintain records of monitoring and testing as required by Table 3.
	8. The Permittee shall maintain a copy of this Plan Approval and the underlying Application approved herein on-site.
	9. The Permittee shall maintain a record of routine maintenance activities performed on the approved EU(s), PCD(s) and monitoring equipment. The records shall include, at a minimum, the type or a description of the maintenance performed and the date and time the work was completed.
	10. The Permittee shall maintain a record of all malfunctions affecting air contaminant emission rates on the approved EU(s), PCD(s) and monitoring equipment. At a minimum, the records shall include: date and time the malfunction occurred; description of the malfunction; corrective actions taken; the date and time corrective actions were initiated and completed; and the date and time emission rates and monitoring equipment returned to compliant operation.
	11. The Permittee shall maintain records required by this Plan Approval on-site for a minimum of five (5) years.
	12. The Permittee shall make records required by this Plan Approval available to MassDEP and USEPA personnel upon request.

Table 4 Key:

EU# = Emission Unit Number

PCD = Pollution Control Device

USEPA = United States Environmental Protection Agency

Table 5	
EU#	Reporting Requirements
Facility-wide	1. The Permittee shall submit to MassDEP all information required by this Plan Approval over the signature of a “Responsible Official” as defined in 310 CMR 7.00 and shall include the Certification statement as provided in 310 CMR 7.01(2)(c).

Table 5	
EU#	Reporting Requirements
	2. The Permittee shall notify the Western Regional Office of MassDEP, BWP Permit Chief by telephone, [413-755-2115], email, [marc.simpson@state.ma.us] or fax [413-784-1149] as soon as possible, but no later than one (1) business day after discovery of an exceedance(s) of Table 2 requirements. A written report shall be submitted to Permit Chief at MassDEP within three (3) business days thereafter and shall include: identification of exceedance(s), duration of exceedance(s), reason for the exceedance(s), corrective actions taken, and action plan to prevent future exceedance(s).
	3. The Permittee shall provide a copy to MassDEP of any record required to be maintained by this Plan Approval within 30-days from MassDEP’s request.
	4. The Permittee shall submit to MassDEP for approval a stack emission pretest protocol, at least 30 days prior to emission testing, for emission testing as defined in Table 3 Monitoring and Testing Requirements.
	5. The Permittee shall submit to MassDEP a final stack emission test results report, within 45 days after emission testing, for emission testing as defined in Table 3 Monitoring and Testing Requirements.

Table 5 Key:

EU# = Emission Unit Number

4. SPECIAL TERMS AND CONDITIONS

The Permittee is subject to, and shall comply with, the following special terms and conditions:

- A. The Permittee shall comply with the Special Terms and Conditions as contained in Table 6 below:

Table 6	
EU#	Special Terms and Conditions
1,2	1. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a)2, EU1 and EU2 shall each be equipped with a condenser and condenser diffuser.
	2. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a)2, EU1 and EU2 shall not be operated without the simultaneous use of the associated condenser and condenser diffuser.
	3. Pursuant to the best available control technology provision of 310 CMR 7.02(8)(a)2, the inlet air temperature of each condenser associated with EU1 and EU2 shall not exceed 30 degrees Celsius.

Table 6 Key:

EU# = Emission Unit Number

- B. The Permittee shall install and use an exhaust stack, as required in Table 7, on each of the Emission Units that is consistent with good air pollution control engineering practice and that discharges so as to not cause or contribute to a condition of air pollution. Each exhaust stack shall be configured to discharge the gases vertically and shall not be equipped with any part or device that restricts the vertical exhaust flow of the emitted gases, including but not

limited to rain protection devices known as “shanty caps” and “egg beaters.” The Permittee shall install and utilize exhaust stacks with the following parameters, as contained in Table 7 below, for the Emission Units that are regulated by this Plan Approval:

Table 7				
EU#	Stack Height Above Ground (feet)	Stack Inside Exit Dimensions (feet)	Stack Gas Exit Velocity Range (feet per second)	Stack Gas Exit Temperature Range (°F)
1	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A
6	N/A	N/A	N/A	N/A

Table 7 Key:
 EU# = Emission Unit Number
 °F = Degree Fahrenheit

4. GENERAL CONDITIONS

The Permittee is subject to, and shall comply with, the following general conditions:

- A. Pursuant to 310 CMR 7.01, 7.02, 7.09 and 7.10, should any nuisance condition(s), including but not limited to smoke, dust, odor or noise, occur as the result of the operation of the Facility, then the Permittee shall immediately take appropriate steps including shutdown, if necessary, to abate said nuisance condition(s).
- B. If asbestos remediation/removal will occur as a result of the approved construction, reconstruction, or alteration of this Facility, the Permittee shall ensure that all removal/remediation of asbestos shall be done in accordance with 310 CMR 7.15 in its entirety and 310 CMR 4.00.
- C. If construction or demolition of an industrial, commercial or institutional building will occur as a result of the approved construction, reconstruction or alteration of this Facility, the Permittee shall ensure that said construction or demolition shall be done in accordance with 310 CMR 7.09(2) and 310 CMR 4.00.
- D. Pursuant to 310 CMR 7.01(2)(b) and 7.02(7)(b), the Permittee shall allow MassDEP and / or USEPA personnel access to the Facility, buildings, and all pertinent records for the purpose of making inspections and surveys, collecting samples, obtaining data, and reviewing records.

- E. This Plan Approval does not negate the responsibility of the Permittee to comply with any other applicable Federal, State, or local regulations now or in the future.
- F. Should there be any differences between the Application and this Plan Approval, the Plan Approval shall govern.
- G. Pursuant to 310 CMR 7.02(3)(k), MassDEP may revoke this Plan Approval if the construction work is not commenced within two years from the date of issuance of this Plan Approval, or if the construction work is suspended for one year or more.
- H. This Plan Approval may be suspended, modified, or revoked by MassDEP if MassDEP determines that any condition or part of this Plan Approval is being violated.
- I. This Plan Approval may be modified or amended when in the opinion of MassDEP such is necessary or appropriate to clarify the Plan Approval conditions or after consideration of a written request by the Permittee to amend the Plan Approval conditions.
- J. The Permittee shall conduct emission testing, if requested by MassDEP, in accordance with USEPA Reference Test Methods and regulation 310 CMR 7.13. If required, a pretest protocol report shall be submitted to MassDEP at least 30 days prior to emission testing and the final test results report shall be submitted within 45 days after emission testing.
- K. Pursuant to 310 CMR 7.01(3) and 7.02(3)(f), the Permittee shall comply with all conditions contained in this Plan Approval. Should there be any differences between provisions contained in the General Conditions and provisions contained elsewhere in the Plan Approval, the latter shall govern.

5. MASSACHUSETTS ENVIRONMENTAL POLICY ACT

MassDEP has determined that the filing of an Environmental Notification Form (ENF) with the Secretary of Energy & Environmental Affairs, for air quality control purposes, was not required prior to this action by MassDEP. Notwithstanding this determination, the Massachusetts Environmental Policy Act (MEPA) and 301 CMR 11.00, Section 11.04, provide certain “Fail-Safe Provisions,” which allow the Secretary to require the filing of an ENF and/or an Environmental Impact Report (EIR) at a later time.

6. APPEAL PROCESS

This Plan Approval is an action of MassDEP. If you are aggrieved by this action, you may request an adjudicatory hearing. A request for a hearing must be made in writing and postmarked within twenty-one (21) days of the date of issuance of this Plan Approval.

Under 310 CMR 1.01(6)(b), the request must state clearly and concisely the facts, which are the grounds for the request, and the relief sought. The hearing request along with a valid check payable to the Commonwealth of Massachusetts in the amount of one hundred dollars (\$100.00) must be mailed to:

Commonwealth of Massachusetts
Department of Environmental Protection
P.O. Box 4062
Boston, MA 02211

This request will be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver as described below. The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority.

MassDEP may waive the adjudicatory hearing-filing fee for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file, together with the hearing request as provided above, an affidavit setting forth the facts believed to support the claim of undue financial hardship.

Should you have any questions concerning this Plan Approval, please contact Cortney Danneker by telephone at (413) 755-2234, or in writing at the letterhead address.

Sincerely,

This final document copy is being provided to you electronically by the Department of Environmental Protection. A signed copy of this document is on file at the DEP office listed on the letterhead.

Marc Simpson
Air Quality Permit Chief
Bureau of Waste Prevention
Western Region

cc: WERO AQ plan file
WERO AQ approval file

ecc: Yi Tian, DEP Boston
Peter Czapienski, DEP Western Region