Instructions for Attachment E201A
ANAEROBIC DIGESTION FACILITY
Supplemental Application Form

(Instructions for Completing DEEP-NSR-APP-201A)

All applications for a permit to construct and operate a stationary source shall provide the information listed in the Regulations of Connecticut State Agencies (RCSA) section 22a-174-3a(c). This supplemental application form shall be completed for a new anaerobic digestion facility.

Anaerobic digestion facilities in Connecticut are permitted as processes including the digester(s) as well as other equipment including, but not limited to, fuel burning units and gas upgrading units. Complete each part of the form as appropriate. If a specific item does not apply, indicate N/A (not applicable). If additional space is needed to answer a question stated in the application, attach separate sheet(s) as necessary, clearly identifying the applicant's name, form name, part number, and unit number.

Note: The data provided in these forms will be used to define the operating limits in your permit.

Questions? Visit the Air Permitting web page or contact the Air Permitting Engineer of the Day at DEEP.BAM.AirPermits@ct.gov or 860-424-4152 (between 8:30 AM and 4:30 PM, Monday through Friday).

Applicant Name - Provide the applicant's name as previously indicated on the *Permit Application for Stationary Sources of Air Pollution* form (DEEP-NSR-APP-200).

Unit Number - Provide the unit number of the subject unit as previously assigned on the *Permit Application for Stationary Sources of Air Pollution* form (DEEP-NSR-APP-200). Please use a consistent reference number for each unit throughout the application package.

Part I: General Information

Location of Anaerobic Digestion Facility – Check the appropriate box to indicate the location of the anaerobic digestion facility. If "other", specify the location.

Anaerobic Digester Type – Describe the type of anaerobic digester that will be used (e.g. Covered Anaerobic Lagoon Digester, Plug-flow Digester, Complete Mix Digester, Induced Bed Reactor Digester, Fixed Film Digester, Anaerobic Sequencing Batch Reactor Digester, High Solids Anaerobic Digester, etc.)

Type of Raw Material Used – Describe the type of raw material that will be used in the digester (e.g. manure, food and food processing waste, yard and crop wastes, sewage sludge, etc.). Include any relevant information such as percentage of each raw material used (if more than one raw material), composition of raw material, etc.

Describe the purpose of the anaerobic digestion facility – Provide a description of how the biogas produced in the anaerobic digestion facility will be used (e.g. power generation, renewable natural gas, etc.).

If the anaerobic digestion facility will be located on leased property, provide expiration date of the lease – If the anaerobic digestion facility is on a leased property, indicate the expiration date of the lease. Any lease agreement is required to define the property lines of the leased property. If the anaerobic digestion facility is not on a leased

property, check “Not on Leased Property”.

Proposed Construction Date – Indicate the anticipated construction date of the anaerobic digestion facility. This should be the date the applicant expects to initiate physical on-site construction activities on the emissions unit which are of a permanent nature. Such activities include, but are not limited to, installation of building supports and foundations, laying of underground pipework, and construction of permanent storage structures.

Part II: Receiving Operation, Anaerobic Digester and Effluent Tank Information

Receiving Operation

Describe how the raw material is transported to the holding and/or mixing tanks of the receiving operation – Describe the method of transport of raw material to the holding and/or mixing tanks of the receiving operation, such as through truck, piping, handfeeding, etc.

Holding/Mixing Tanks (Digester Influent) - Provide the following information for each tank:
If more tanks are used than rows provided, add additional rows to the form by duplicating the page as needed.

Tank Number – Provide tank number or other unit identification if available.

Dimensions (feet) – Provide the measurements of the tank in feet, and indicate type (cylindrical, rectangular, etc.).

Maximum Daily Throughput of Feedstock (gallons) – Indicate the number of gallons of feedstock entering the digester each day.

Maximum Daily Throughput of Feedstock (lbs) – Indicate the amount of feedstock entering the digester, in pounds, each day.

Maximum Annual Throughput of Feedstock (Tons) – Indicate the amount of feedstock introduced into the digester, in tons, in a 12-month period.

Conversion Factor Based on Feedstock (lb/gal) – Provide the multiplier, in lb/gal, used to convert feedstock throughput from volume to weight basis.

For Each Anaerobic Digester
If more anaerobic digesters are used than rows provided, duplicate the page to provide the requested information for additional digesters.

Anaerobic Digester Number – Provide the anaerobic digester number or other unit identification if available.

Tank Shape – Indicate the shape of the tank (e.g. cylindrical, rectangular, etc.)

Dimensions (feet) – Provide the measurements of the anaerobic digester in feet.

Maximum Capacity (gallons) – Provide the maximum storage capacity of the anaerobic digester in gallons.

How often does the Anaerobic Digester require a clean out? – Indicate how often the anaerobic digester will require a cleanout. Detail if cleanout is partial or complete and indicate if and for how long the system may be taken offline during the cleanout, if known.

Describe how the feedstock enters the anaerobic digester(s) and how the digestate leaves the anaerobic digester(s) – Describe the process of feedstock entering the digester and digestate leaving the digester (e.g. by truck, piping, pumps, etc.). Is the influent mixed or separated prior to entering the digester? Are there any additional additives or liquids added? Is the effluent mechanically separated after leaving the digester?

Describe Use of Digestate – Indicate how the digestate will be used (e.g. bedding for livestock, fertilizer, brought offsite as waste, etc.).

If final storage of digestate is a lagoon, indicate the maximum capacity of the lagoon in gallons – If final storage is a lagoon, indicate the maximum

volume the lagoon can hold, in gallons. If final storage is not a lagoon, check "No Lagoon".

For Each Effluent Tank
If more tanks are available than rows provided, duplicate the page to add additional tanks as needed.

Effluent Tank Number – Provide the effluent tank number or unit identification if available.

Maximum Capacity of Effluent Tank (gallons) – Provide the maximum storage capacity of the effluent tank, in gallons.

Final Storage – Indicate if the effluent tank is used for final storage of digestate by checking "Yes" or "No".

Part III: Fuel Burning Equipment

Is any fuel burning equipment (boiler, IC engine, other) being installed as part of this project? – Indicate if any fuel burning equipment is being installed by checking "Yes" or "No".

If "Yes", provide the following information:

Type of Unit(s) – For each row, indicate the type of unit (boiler, IC engine, or other). If other, specify the type of unit. If there are additional units than rows provided, duplicate the page to add additional units.

Complete and submit the following forms for each fuel burning unit: - For each piece of fuel burning equipment indicated in Part III of the application, complete and provide the forms below as applicable.

Attachment E202: Fuel Burning Equipment Form (DEEP-NSR-APP-202)

Attachment E210: Air Pollution Control Equipment (DEEP-NSR-APP-210), if applicable

Part IV: Flare Information

Complete and submit this form for each flare - Attachment E203: Incinerators or Flares (DEEP-NSR-APP-203)

Part V: Gas Upgrading Unit

A gas upgrading unit is used to condition the anaerobic digester biogas into Renewable Natural Gas (RNG) to satisfy natural gas industry standards for shipping or injection into the distribution pipeline. The standards apply to the maximum concentrations of CO_2, H_2S, and water vapor that RNG can contain.

Is a gas upgrading unit being installed as part of this project? – Indicate if a gas upgrading unit is being installed as part of the project by checking "Yes" or "No".

If "Yes", provide the following information:

Description of Equipment - provide a description of the gas upgrading unit (e.g. the gas upgrading unit is comprised of a dryer, blower, activated carbon pre-treatment, membranes and tail gas vent). Specify the function of each component and the pollutant that removes.

Pollutant(s) Controlled – List the pollutant(s) that will be reduced by the gas upgrading unit.

Gas Upgrading Unit Overall Control Efficiency – Provide the control efficiency (per pollutant) of the gas upgrading unit.

Tail Gas Vent Description and Location - Provide a description and the location of the tail gas vent. The parameters of this exhaust point should be indicated on the Stack Parameters Form (DEEP-NSR-APP-211)

Tail Gas Vent Maximum Methane Concentration (outlet) - Provide the maximum methane concentration exiting the tail gas vent in units of ppm.

Tail Gas Vent Maximum H_2S Concentration

(outlet) - Provide the maximum H_2S concentration exiting the tail gas vent, in units of ppm.

Tail Gas Vent Maximum Concentration of Other Pollutant(s) (outlet) - Provide the concentration of any other pollutant (e.g. siloxanes, Volatile Organic Compounds (VOCs), etc.) exiting the tail gas vent.

Complete and submit this form for each gas upgrading unit - Fill out Attachment E210: Air Pollution Control Equipment (DEEP-NSR-APP-210).

Part VI: Control Devices Used to remove Hydrogen Sulfide (H_2S) and/or Other Pollutants

During combustion, H_2S reacts with water vapor to form highly corrosive sulfuric acid. This acidic atmosphere creates corrosive conditions that can quickly degrade combustion and emission control equipment. Therefore, reducing H_2S and water vapor concentrations in biogas is a prerequisite for biogas use in a combustion device. The degree of biogas processing that is necessary depends on its planned use.

Are any other control devices being used to remove H_2S and/or other pollutants as part of this project? – Indicate if there are any additional control devices to remove H_2S and/or other pollutants by checking "Yes" or "No".

If "Yes", provide the following information:

Description and Location of other control devices used to remove H_2S and/or other pollutant(s) – Provide a description of any gas treatment unit(s) used to remove H_2S and/or other pollutants (e.g. a scrubber to control H_2S prior to the biogas going to the flare, or an activated carbon unit to further control H_2S prior to the biogas entering the engine, etc.).

Complete and submit this form for each control device - Fill out Attachment E210: Air Pollution Control Equipment (DEEP-NSR-APP-210).

Part VII: Attachments

This section offers a checklist of all the attachments necessary to complete this application. Not all attachments may be applicable to your application. Where the checklist states "**IF APPLICABLE**", your particular situation will determine if the attachment is required.

Check the appropriate box by each attachment being submitted as verification that all applicable attachments have been submitted. Please label all attachments as referenced in the permit application form and these instructions and be sure to include the name of the applicant as indicated on the application form.

Attachment E202-A: Process Information and Flow Diagram, REQUIRED

Submit a process flow diagram indicating all related equipment, air pollution control equipment and stacks, as applicable. Identify all materials entering and leaving each such device indicating quantities and parameters relevant to the proper operation of the device. Indicate all monitoring devices and controls.

Attachment E201 A-B: Manufacturer Information, REQUIRED

Submit copies of the manufacturer specification sheets for the unit, the air pollution control equipment and the monitoring systems.

Attachment E202: Fuel Burning Equipment, IF APPLICABLE

Attachment E203: Incinerators or Flares, IF APPLICABLE

Attachment E210: Air Pollution Control Equipment, IF APPLICABLE

ADDITIONAL RESOURCES

1. CTDEEP – Farm Based Anaerobic Digesters Fact Sheet - Farm-Anaerobic-Digester-Factsheet.pdf
2. AgSTAR – EPA - https://www.epa.gov/agstar
3. EPA - Anaerobic Digester/Biogas System operator Guidebook: https://www.epa.gov/sites/default/files/2020-11/documents/agstar-operator-guidebook.pdf