

FACT SHEET

Farm-Based Anaerobic Digesters

An Environmental Permitting Factsheet



Farm-based anaerobic digestion (AD) of manure presents an opportunity to increase renewable energy production, improve the economics of Connecticut's agricultural sector, reduce nutrient loading and associated water quality impairments, and address climate change. ADs also align with the Department of Energy and Environmental Protection's (DEEP's) charge to conserve, improve, and protect the natural resources and the environment of the State of Connecticut, as well as to advance our efforts to generate cleaner, reliable and

more affordable energy for the people and businesses of the State. Connecticut and DEEP support the development, deployment, and operation of anaerobic digester units.

An AD is a system where bacteria biologically digest and break down organic material in the absence of oxygen (or "anaerobically"). ADs typically process animal manure, food scraps, and wastewater biosolids or a combination thereof. ADs produce biogas and digestate (residual solid and liquids) as byproducts. Biogas is mainly made up of methane gas (CH₄) which can be stored and used as a sustainable energy source. Biogas collected from ADs is often used to generate electricity on-site or the biogas is further processed to produce renewable natural gas (RNG) and fed by injection directly into natural gas pipelines. Any excess biogas produced, along with biogas unable to be used in downstream equipment due to capacity limitations, downtime, maintenance, or failure are sent to a flare to be burned off.

Environmental permits are necessary to make sure that ADs are built and operated in accordance with best practices and in a manner that protects the environment and public health. This factsheet provides information on the types of DEEP permits that may be required for the development of farm-based ADs and the timing and sequencing of those permits. Not all of the permits listed in this factsheet may be necessary and permitting requirements will be dependent on the details of the specific AD project. It is also important to note that the Air, Water, and Waste permits discussed in this factsheet may be submitted and processed concurrently if it is critical to the project to achieve the shortest permitting timeframe. An experienced environmental consultant who is familiar with Connecticut's regulations and specific environmental challenges can assist potential applicants in obtaining any necessary environmental permits.

<u>DEEP's Concierge and Permit Assistance service</u> is also available for pre-application assistance. A pre-application meeting is recommended because it gives the applicant an opportunity to present their proposed AD to DEEP's permit program staff, review the expected permitting forms, and address any questions or concerns either the applicant or DEEP may have. To schedule a meeting, please complete the <u>Pre-Application Questionnaire</u> and submit it to <u>DEEP.OPPD@ct.gov</u>.

- I. Natural Diversity Data Base (NDDB) At the outset of a project, it is necessary to determine if there are known occurrences of any state or federally-listed species within the impact area of the project site (Section 26-306 of the Regulations of Connecticut State Agencies). DEEP recommends conducting an initial site evaluation to assess the potential to support state-listed species. Developers will then need to determine if their project is in an area with documented state-listed species; maps can be found at https://portal.ct.gov/DEEP/Endangered-Species/Natural-Diversity-Data-Base-Maps. If the project site is in a documented area, consultation with DEEP's NDDB staff will be required to agree upon impact-avoidance and protection measures. Protection measures will be included in a determination letter from DEEP; this letter must be included with filings for other state permit applications or general permit registrations. Material to prepare a Request for Review can be found at https://portal.ct.gov/DEEP/Endangered-Species/Endangered-Species-ReviewData-Requests. Please note, it typically takes NDDB staff four to six weeks to review and issue NDDB letters; however, if further survey work is needed, the process can take longer.
- **II. Stormwater** There are two types of stormwater permits that may apply to a project. The first is required for construction. The second may apply during the operation of the facility.

Any project disturbing one or more acres of land during construction must comply with the terms and conditions of the DEEP General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (Construction Stormwater General Permit). Projects that are subject to municipal review and approval that disturb less than five acres can comply with the Construction Stormwater General Permit, without filing a registration with DEEP, by adhering to municipal land use requirements for erosion and sedimentation control; the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended; and the Stormwater Quality Manual, as amended. A registration is required to be filed with DEEP for all projects subject to municipal review and approval that disturb five or more acres of land during construction, and for all other projects that are exempt from local review and approval, including projects requiring Connecticut Siting Council approval, that disturb one or more acres of land. The typical processing timeframe for the Construction Stormwater General Permit registration is up to 60 days for locally approvable projects, and up to 60 or 90 days (depending on extent of land disturbance) for projects exempt from local review and approval or which require Siting Council approval. These timeframes include a 30-day public comment period. More information about the Construction Stormwater General Permit can be found at: https://portal.ct.gov/DEEP/Water-Regulating-and-Discharges/Stormwater/Construction-Stormwater-GP.

ADs may require coverage under DEEP's General Permit for the Discharge of Stormwater Associated with Industrial Activity (Industrial Stormwater General Permit) if the activity generates a stormwater discharge that is collected and conveyed to surface water. The Industrial Stormwater General Permit requires registration by the operator of the facility to be filed by DEEP; the development and implementation of a Stormwater Pollution Prevention Plan; inspections; and stormwater discharge monitoring. The processing time for a registration under the Industrial Stormwater General Permit is between 60 and 90 days. More information about the Industrial Stormwater General Permit can be found at: https://portal.ct.gov/DEEP/Water-Regulating-and-Discharges/Stormwater/Industrial-Stormwater-GP.

Determinations regarding natural resources and other permit requirements (NDDB, forestry, wetlands, dam safety, flood management, brownfield remediation, landfills, etc.), are typically required for both stormwater general permits and inform the requirements for filing for a stormwater permit registration, and development of the requisite Stormwater Pollution Control Plan and/or Stormwater Pollution Prevention Plan.

At any time, the Commissioner can determine that a discharge associated with a construction activity or a stormwater discharge associated with an industrial activity requires an individual permit under the National Pollutant Discharge Elimination System (NPDES) program and Connecticut's Water Pollution Control Act, typically for very large or more complex project sites, or sites with environmentally significant receptors or natural resources adjacent to the site or nearby. Likewise, an applicant can elect to apply for an individual permit rather than seek coverage under a Stormwater General Permit. Individual permit processing time can be longer, due to the individualized determinations that must be made as part of an individual permit application technical review.

Information on water discharge permits and general permits can be found at: https://portal.ct.gov/DEEP/Permits-and-Licenses/Water-Discharge-Permits-and-General-Permits .

III. Wastewater Discharge - If an AD facility will be generating process wastewater discharges to groundwater or surface waters or wastewaters that may be conveyed or transported to a Publicly Owned Treatment Works (i.e., municipal sewage treatment plant), a discharge permit will be required. It is important to note that any stormwater commingled with process wastewater will be deemed process wastewater and will not be authorized under the Industrial Stormwater General Permit. Such discharges may be eligible for coverage under either the General Permit for Discharges from Miscellaneous Industrial Users (MIU GP) or the General Permit for the Discharge of Wastewaters from Significant Industrial Users (SIU GP).

For further assistance regarding permitting requirements for process wastewater discharges management, we encourage you to contact the Water Permitting and Enforcement Division to discuss your project at (860) 424-3025. Information on water discharge permits and general permits for process wastewaters can be found at: https://portal.ct.gov/DEEP/Water-Regulating-and-Discharges/Industrial-Wastewater/Industrial-Wastewater.

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- IV. Nutrient Management for Facilities with Concentrated Animal Feeding Operations Under the Federal Clean Water Act, a Concentrated Animal Feeding Operation (CAFO) with point source discharges to surface waters requires a NPDES permit. A Comprehensive Nutrient Management Plan must be developed and implemented with this type of permit. Development of such a plan takes time and should be the first step in managing manure and should occur prior to any on-farm land application of agricultural waste or other materials produced from an AD. Industrial stormwater management, which typically requires separate permitting, can be included in the CAFO permit. The processing time for this type of permit is estimated to be about 12 months and includes public notice and comment.
- V. Environmental Justice DEEP established its Environmental Justice (EJ) Policy in the 1990s, which became the basis for Public Act 08-94 that established the EJ Law, as codified at section 22a-20a of the Connecticut General Statutes, as recently amended by Public Act 20-6. For applicable regulated activities and specific facilities, such as an AD that processes in excess of 25 tons of material each month, it is necessary to determine if the AD will be located in an environmental justice community, such as a distressed municipality or census block, and thereby subject to the EJ Law. If the EJ Law is applicable, an EJ Public Participation Plan is required to be developed and submitted to DEEP for review and approval by the EJ Coordination Program. The EJ Public Participation Plan must include public notice and ensure meaningful public engagement. The EJ Public Participation Plan must be submitted and approved in writing prior to the submittal of a Solid Waste Facility permit application or a New Source Review or Title V permit application, since this plan will need to be included in solid waste and air permits. Information on Environmental Justice may be found at https://portal.ct.gov/DEEP/Environmental-Justice/Env
- VI. Solid Waste Some AD facilities may require a solid waste permit if a significant amount of non-farm generated organic solid waste is received for anaerobic digestion. A farmer or developer working with a farmer proposing an on-farm AD may be eligible for an exemption from solid waste permitting, even though a portion of the feedstock is not generated on-site. Section 22a-208cc of the Connecticut General Statutes (CGS) provides the solid waste permitting exemption for on-farm AD facilities, colocated with animal feeding operations, that process no less than 50% farm-generated organic waste and no more than 40% food scraps, food processing residuals and soiled or unrecyclable paper. To maintain the exemption, the balance of the organic waste (10%) must be farm-generated. The exemption applies to farm cooperatives "pooling" farm-generated organic wastes for processing through the on-farm AD facility.

If an on-farm AD facility proposal includes a plan to incorporate more than 40% of the feedstock from non-farm sources, the exemption is no longer available and <u>CGS Section 22a-208a</u> applies. A Permit to Construct and Operate a Solid Waste Facility may be required, and the farmer or developer should request a <u>pre-application meeting</u>. The time to process a solid waste facility individual permit may take from 9 to 12 months. An on-farm AD facility proposal can be phased to utilize the exemption in CGS 22a-208cc for initial construction and operation, while concurrently a solid waste facility permit is

pursued for additional phases that do not meet the exemption. Public notice is required for both the submission to DEEP of an application for a solid waste facility and the Commissioner's tentative determination to approve or deny the application.

More information about organics management can be found at https://portal.ct.gov/DEEP/Waste-Management-and-Disposal/Organics-Recycling/Large-Scale-Organics-Management#AD.

VII. Air – An air permit provides a framework for the safe operation of ADs in a manner that its allowable air pollutant emissions are protective of human health and the environment. The regulation of air emissions varies from state to state and follows emission standards set forth by the U.S. Environmental Protection Agency. Because of Connecticut's ongoing air quality challenges, emissions reductions from stationary sources are a necessary piece of Connecticut's strategy to meet federal air quality standards. Consequently, our permitting regulations differ from neighboring states.

Most ADs located in CT are required to obtain an air permit. These permits are also known as a New Source Review (NSR) permit and are issued prior to the ADs construction and operation. In accordance with RCSA Section 22a-174-3a(a)(1)(D), a new emission unit with "potential emissions" (PTE) of 15 tons per year of any individual "air pollutant", as defined in RCSA Section 22a-174-1(5), is required to apply and obtain a permit before starting construction. In the case of ADs, the typical individual air pollutant that triggers permit applicability is methane. Permit applicability could also be triggered by the emissions of fuel burning equipment at the facility (flares, boilers, engines, etc.) with additional pollutants of concern including nitrogen oxides (NOx), carbon monoxide (CO), volatile organic compounds (VOCs), particulates (PM2.5), sulfur oxides (SOx).

"Potential emissions" are defined in <u>RCSA section 22a-174-1(91)</u>. In the case of an AD, potential emissions of methane are calculated at 8,760 hours per year at the maximum biogas generating capacity of the AD prior to the application of any control equipment. This same calculation could be used for any other air pollutant emitted by the facility:

Methane PTE: (Source-specific emission factor) x (8.760 hrs/yr) x (1 ton/2,000 lbs)

DEEP will issue a single permit for the entire facility (i.e., anaerobic digester, flare, engine (combined heat and power), RNG processing equipment, etc.). A single permit encompassing the entire facility allows DEEP to list all equipment at the facility in a single document with all appropriate limitations, monitoring, record keeping, testing schedules, reporting requirements and emission limitations to ensure that, at a minimum, emissions will be in compliance with state and federal criteria pollutant and hazardous air pollutant regulations.

Other important components of the NSR permitting process include, the Best Available Control Technology (BACT) review and air emissions modeling. Pursuant to RCSA Section 22a-174-3a(j)(C), an individual BACT review is required for each pollutant with PTE over 15 tons per year and is conducted on a case-by-case basis, based on the design of the AD facility. The Connecticut BACT

<u>Database</u> and the <u>EPA RACT/BACT/LAER Clearinghouse</u> can be used to search for other AD facility BACT determinations issued in Connecticut and in the United States, respectively. It is also required to demonstrate that the operation of the source will not cause or contribute significantly to a violation of any federal or state air quality standard. This demonstration must include estimates of air quality impacts via the use of air quality modeling, the level of which varies based on expected emissions from the source. Information on air quality modeling can be found on the <u>Air Quality Modeling</u> <u>webpage</u> and in DEEP's <u>Ambient Impact Analysis Guideline</u>. DEEP highly encourages applicants to contact DEEP modeling staff before undertaking any regulatory modeling analysis in Connecticut.

Air permitting forms and instructions can be found at: https://portal.ct.gov/DEEP/Permits-and-Licenses/Air-Emissions-Permits-and-General-Permits. Air permits may be submitted concurrently with waste permits. DEEP strongly encourages applicants to request a per-application meeting before the application is submitted.

The typical permit processing timeframe is six to nine months, and all air permits for new sources must go through a 30-day public comment period. (Please refer to the section on Public Notice below.)

We encourage you to contact the Air Permitting group to discuss your project at DEEP.BAM.AirPermits@ct.gov or (860) 424-4152.

VIII. Energy - The anaerobic digestion process produces biogas that can be converted into various energy products including being burned to create heat to power generators, fuel cells or micro-turbines to generate electricity. The biogas can also be compressed to be usable for natural gas vehicles or injected into the natural gas pipeline.

The State offers incentives to AD facilities to generate electricity. AD electric generation is a Class I Resource under the State's Renewable Portfolio Standards. An AD is also eligible to participate in the Virtual Net Metering (VNM) program in which the two investor owned electric distribution companies will credit farms for the excess energy generated from an AD facility through its net metering rate. More information about programs and incentives is available from the Connecticut Farm Energy Program. DEEP has the authority to issue procurements for the electric output from Class I resources in several different statutes in which AD facilities are eligible. DEEP has authority to issue a procurement specifically for up to 10 MW from AD in Section 17 of Public Act 19-35.

Depending on the size of the project and if the facility wishes to participate in the regional electric market, an electric-generating AD facility must apply to interconnect to the distribution system of the electric utility company or the regional electric grid operator ISO-NE. If system upgrades are required for an existing distribution system to accommodate the additional electricity, the applicant must pay upgrade costs. Farms considering interconnecting an AD facility should contact their utility for the specific rules, application guidelines, and fees (Eversource Interconnections; United Illuminating

<u>Interconnections</u>). Interconnection is an additional, separate process from permitting which requires a National Electric Code inspection before allowing the system to sell electricity back to the grid.

For AD facilities intending to sell biogas on the natural gas distribution system, the Connecticut Public Utilities Regulatory Authority will issue a decision on a gas quality interconnection standard and approval process for biogas by September 1, 2021.

IX. Public Notice - Public Notice is required as a part of many permit processes and can be done concurrently for multiple permit applications. Information on the public noticing requirements pursuant to <u>CGS Section 22a-6g</u> and <u>CGS Section 22a-6h</u> and the Rules of Practice (<u>RCSA Section 22a-3a-1 through 6</u>) should be reviewed and provide information on the Notice of Tentative Determination, which has a public comment period of 30 days. There are fees associated with the publication of public notices.

For all Individual Permits, once the Notice of Tentative Determination is issued, the applicant and the public have 30 days to provide comments on the draft permit or denial. During the 30-day public comment period, an informational or adjudicatory hearing may be requested. If a hearing is requested on the proposed permit, the Office of Adjudications takes over the process to coordinate the hearing. The hearing process could add approximately 120 days to the processing of a permit application beyond the estimated processing timeframes mentioned in previous sections and in the table below.

X. Other Considerations - Local/municipal review and permitting may be required, such as building construction and wetlands. Local permits are not covered in this factsheet. Please contact the local planning office to ensure your project meets all local requirements. Additionally, if an AD generates less than one megawatt of energy, local/municipal review is typically required. The Connecticut Siting Council has jurisdiction over energy-generating facilities greater than one megawatt, if power from the facility will or can be fed into the grid. If the facility's output is only for internal use or for some non-electricity generating use, Siting Council jurisdiction is not triggered. More information about the Connecticut Siting Council can be found at https://portal.ct.gov/CSC.

Permit processing timelines are highly dependent on receiving an administratively and technically complete permit application. Therefore, DEEP recommends that you request a pre-application meeting before the application is submitted to ensure that your application package is properly completed at the time of submittal. During processing of your application, requests for information should be replied to promptly to expedite the processing of your application.

DEEP Air, Water, and Waste permits may be submitted concurrently. Public notice comment periods required by different permits may be coordinated. Construction and operation cannot begin until permits are obtained.

Additional links to DEEP's permit programs can be found at <a href="https://portal.ct.gov/DEEP/Permits-and-Licenses/Permits-and-License

Construction of Fort Hill Farm Anaerobic Digester Facility





Summary of DEEP Permits that may be Applicable

Permit Program	Permit Name	Fees	Public Notice	Estimated Processing Timeframe	Permit Submittal
Bureau of Natural Resources, Wildlife Division	National Diversity Database State Listed Species Review Request	None	None	30 - 45 days	Central Permit Processing Unit (CPPU) Department of Energy and Environmental Protection 79 Elm St. Hartford CT 06106- 5127 - OR - deep.nddbrequest@ct .gov
Office of the Commissioner , Environmental Justice	Environmental Justice Plan	None	Public participation stated in EJ plan to be held before Notice of Tentative Determination	30-days for initial review and tentative approval. Final EJ report to be submitted prior to Notice of Tentative Determination with 30-day review. Total time can range from 9 months to 2 years, depending on public input and concerns with the facility location.	EJ Coordination Program edith.pestana@ct.gov
Bureau of Materials Management, Waste Engineering and Enforcement Division	Permit to Construct and Operate a Solid Waste Facility (may be required if more than 40% non-farm waste is received)	Range begins at \$1,375	Initial Notice of application - AND - Notice of Tentative Determination (30 days)	9 – 12 months	CPPU
Bureau of Air Management, Air Permitting Division	New Source Review Permit	Range begins at \$3,250 for new minor sources, including \$940.00 application fee.	Initial notice of application - AND - Notice of Tentative Determination (30 days)	6 – 9 months	DEEP.BAM.AirPermits @ct.gov

Permit Program	Permit Name	Fees	Public Notice	Estimated Processing Timeframe	Permit Submittal
Bureau of Materials Management, Water Permit and Enforcement Division	NPDES Permit For Stormwater from Farm Owned & Operated AD Facility - On Farm Only On-Farm Manure Only On-Farm Manure, and Off-Site Manure and/or Food Waste	For farms classified as a Concentrated Animal Feeding Operation (CAFO) with an associated discharge of more than 1,000 gallons per day to the waters of the state: Individual NPDES CAFO Permit with Comprehensive Nutrient Management Plan (CNMP) approved by DEEP* and USDA's Natural Resources Conservation Service (NRCS) or certified planner. Application fees are based on number of animals in the farm operation: For 200-599 cattle: Application \$1,300.00 / Annual \$656.25 For 600-1200 cattle: Application \$2,875.00 / Annual \$656.25 For >1200 cattle: Application \$4,187.50 / Annual \$656.25 * If CNMP approved by DEEP, no registration for Industrial Stormwater General Permit (ISGP) required. For a CAFO with no associated discharge to the waters of the state, then ISGP is required.	Initial Notice of application (30 days) - AND - Notice of Tentative Determination (30 days)	12 months	CPPU
		For farms not classified as a CAFO, then the Industrial Stormwater General Permit or Individual Stormwater Permit is required for the AD facility. Industrial Stormwater General Permit Fee: \$500. Individual Stormwater Permit Application Fee: \$6,550.00. Individual Stormwater Permit Annual Fee: \$2,912.50.	GP: 30-day Public Notice and Comment Period IND: 30-day initial notice of application - AND - Notice of Tentative Determination (30 days)	GP: 60- 90 days IND: 12 months	GP: ZFIIe IND: CPPU

Permit Program	Permit Name	Fees	Public Notice	Estimated Processing	Permit Submittal
J				Timeframe	
Bureau of Materials Management, Water Permit and Enforcement Division	Stormwater Permit For Stormwater from Outside Entity Owned & Operated AD facility - On-Farm or Off-Farm On-Farm Manure, Other Farm Manure and/or Food Waste **	Industrial Stormwater General Permit or Individual Stormwater Permit is required for the AD facility. Industrial Stormwater General Permit Fee: \$500 Individual Stormwater Permit Application Fee: \$6,550.00 Individual Stormwater Permit Annual Fee: \$2,912.50 ** Farms receiving liquid digestate required to have NMP (land application only, still accounts for all nutrients on each farm).	GP: 30-day Public Notice and Comment Period IND: 30-day initial notice of application - AND - Notice of Tentative Determination (30 days)	GP: 60- 90 days IND: 12 months	GP: IND: CPPU
Bureau of Materials Management, Water Permit and Enforcement Division	Stormwater Construction Permit For Stormwater from Construction and Dewatering Activities for AD Projects	A General Permit or Individual Permit is required for Stormwater and Dewatering Wastewater from Construction Activities. Construction Stormwater General Permit Fee: (i) Locally Approvable Projects for sites with total disturbance equal to or greater than five (5) acres: \$625.00 (ii) Locally Exempt Projects for sites with total disturbance equal to or greater than one (1) acre, as follows: (a) For sites with total disturbance of between one (1) and fifteen (15) acres: \$3,000 (b) For sites with total disturbance equal to or greater than fifteen (15) acres and less than fifty (50) acres: \$4,000. (c) For sites with total disturbance equal to or greater than fifty (50) acres: \$5,000 Individual Stormwater Permit Application Fee: \$6,550.00 Individual Stormwater Permit Annual Fee: \$2,912.50	GP: 30-day Public Notice and Comment Period IND: 30-day initial notice of application - AND - Notice of Tentative Determination (30 days)	GP: 60- 90 days IND: 12 months	GP: IND: CPPU

Permit Program	Permit Name	Fees	Public Notice	Estimated Processing Timeframe	Permit Submittal
Bureau of Materials Management, Water Permit and Enforcement Division	Wastewater Discharge For Process Wastewater Discharges to POTW or to Surface Waters from AD Facilities	Process wastewater discharges from AD facilities require a General Permit or Individual Permit. Applicable fees are based on category and quantity of discharge. For process wastewaters conveyed or transported to a Publicly Owned Treatment Works, the wastewater may be eligible for coverage under one of two Industrial User General Permits: 1) Miscellaneous Industrial User GP (<25,000 gallons per day) Fee: \$ None (Local POTW authority may have applicable fees), or 2) Significant Industrial User GP (25,000 gallons per day or more) Fee: \$1,000.00 Individual Permit for Process Wastewater Discharges to POTW or to Surface Waters from AD Facilities (for Composting Facility, as defined in CGS Section 22a-207): Application Fee: \$9,700.00 Annual Fee: None	GP: 30-day Public Notice and Comment Period IND: 30-day initial notice of application - AND - Notice of Tentative Determination (30 days)	12 months	CPPU

This fact sheet is intended for informational purposes only based on the information available as of the date of its publication and does not represent a formal jurisdictional determination by which DEEP or any other permitting authority referenced will be bound. Information contained in this fact sheet does not represent a comprehensive list of all permit requirements potentially applicable, which in most cases can only be determined on a site-specific basis. It is intended only to provide information on permits that may be required. Refer to the most current statutes, regulations, and public acts for specific language pertaining to each permit. It is your responsibility to comply with all applicable laws. Contact DEEP (DEEP.CONCIERGE@ct.gov) with questions regarding a specific site or project.

Rev. July 28, 2021