DEP License Required?

- Facilities digesting only manure and agricultural wastes → No
- Facilities (including farms) digesting manure and residuals/solid waste from off-site → Yes
- WWTPs digesting own sludge → No
- Facilities digesting Type II (or Type III) from off-site → Yes
Licensing ADs in Maine

- **Solid Waste Management Rules: Processing Facilities, Chapter 409**
- Siting standards - setbacks to water supplies, natural resources, property boundaries, airports, etc.
- Design and operating standards – environmental monitoring, leak detection, odor management, final disposition of digester outputs
Design and Operating Standards

- Design capacity – accommodate throughput
- Sampling and Analytical Work Plan for feedstocks and residuals
- Run-off, storm water and leachate control for 25-year, 24-hour storm
- **Odor control**
- If digester is below grade, leak detection required
Digestate

• Digestate – material remaining after anaerobic digestion (liquid and solid)

• If used as soil amendment
  – Agronomic Utilization of Residuals, Chapter 419

• If other off-site beneficial use such as animal bedding
  – Beneficial Use of Solid Wastes, Chapter 418
Regulating ADs

• Annual (at least) DEP inspection
• Annual reports
• Analytical requirements – feedstock dependent
  – Heavy metals
  – Salmonella or fecal coliform
  – Semi-Volatile Organic Compounds (SVOCs)
  – Volatile Organic Compounds (VOCs)
Odor Control

- Main compliance issue faced by ADs
- 99% of complaints are for odor issues
- Properly-sized biofilter or other odor control equipment
- Receiving area can be a major source of odor
Maine AD Facilities

- Currently 3 in operation
- Exeter Agri-Energy in Exeter, ME
- Village Green in Brunswick, ME
- Lewiston-Auburn Water Pollution Control Authority (LAWPCA) in Lewiston, ME
Anaerobic Digesters in Maine
Exeter Agri-Energy

- Co-located with Stonyvale Farm
  - Stonyvale is second largest dairy in Maine with ~1,000 milking cows
- Licensed in 2011, began operating in 2012
- (2) 396,000-gallon digesters
- (2) feedstock receiving tanks
- 1 MW combined heat and power (CHP) unit
- “Bio-separator” for digestate processing
Exeter Agri-Energy
Exeter Agri-Energy (cont.)

• Feedstocks
  – 7,300,000 tons manure from Stonyvale
  – 6,649 tons liquid food residual, FOG, Glycerol, DAF sludge (from ME, NH, MA, RI)
  – 8,154 tons source separated organics (ME, MA)
Exeter Agri-Energy (cont.)

• Depackager
  – Separates packaged food from plastic, metal, styrofoam, cardboard containers
  – Add water to form slurry then to AD
Exeter Agri-Energy (cont.)

• Outputs
  – 5,825 MW-hr electricity
  – 10,950 cubic yards dairy bedding from dewatered digestate (bio-separator) to Stonyvale
  – 11,000,000 gallons liquid digestate to Stonyvale and used on farm fields as fertilizer per the approved Nutrient Management Plan
Exeter Agri-Energy (cont.)

• On the horizon
  – Approved for expansion to double size of facility to ~1,584,000 gallons and add 2 1-MW engines
  – Revising design to build 1 larger digester rather than 2 smaller digesters
  – Working with composter in South Berwick, ME to consolidate organics from southern Maine and other parts of New England for shipment to AD
Village Green

- Located at former Brunswick Naval Air Station
- Licensed in 2015, began operating in 2016
- (1) 850,000-gallon digester
- Liquids receiving tank
- Receiving hopper with grinder and macerator
- 230,000-gallon equalization tank
- 1-MW combined heat and power (CHP) unit
Village Green
Village Green (cont.)

• Feedstocks
  – 18,301 tons biosolids (ME, NH, MA)
  – 17,042 tons septage (ME)
  – 348 tons FOG (ME)
  – 1,545 tons food residuals (ME, MA)
Village Green (cont.)

• Outputs
  – 1,961 MW-hr electricity to local utility
  – 54,085 tons liquid digestate/process water to POTW
  – 10,175 tons dewatered digestate to landfill
Village Green (cont.)

• On the horizon
  – Recently approved to land-apply Class B dewatered digestate on 126 acres in central Maine
  – Investigating pilot project to land-apply Class A liquid digestate
  – Investigating pilot project to compost dewatered digestate
  – Goal is to keep all digestate out of landfill
LAWPCA

- Located at the Lewiston-Auburn Water Pollution Control Authority’s 14 MGD WWTP
- Began operation in 2013
- 2 700,000 gallon digesters
- 168,000-gallon digestate/biogas storage tank
- Feedstock receiving station
- 2 230-kW CHP units
LAWPCA (cont.)

• Feedstocks
  – Brewery waste (42,294 gallons*)
  – Chicken processing waste/DAF waste (96,000 gallons*)
  – FOG
  – Liquid food residuals (25,400*)
  – Biodiesel production waste (glycerol)
  – Deicing fluid (48,115*)
  – Yogurt whey (not currently)

*Data from February and March 2017
LAWPCA (cont.)

• Outputs
  – 1,941 MW-hr electricity
  – All liquid digestate back to WWTP
  – 9,255 cubic yards Class B dewatered digestate (biosolids) land-applied
  – 4,307 cubic yards dewatered digestate composted at LAWPCA compost facility in Auburn, ME
LAWPCA (cont.)

• On the horizon
  – No major changes expected
  – 2018 will be first time they take one of the digesters down for clean out
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