



Biogas Facilities

Council Update

December 13, 2021



An Overview - Anaerobic Digestion

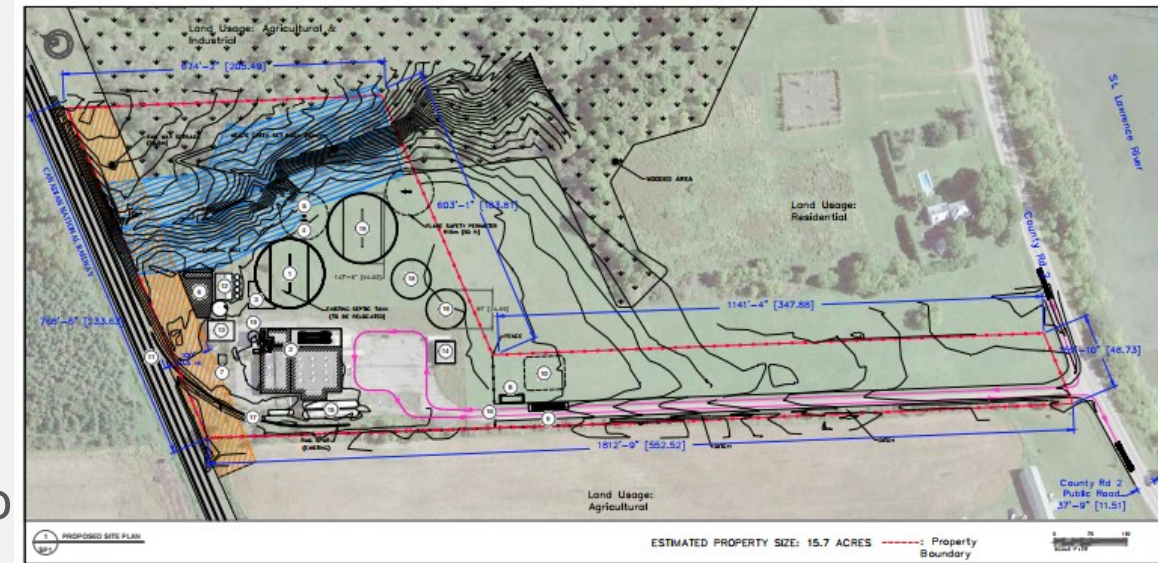
- Anaerobic digestion is not a new technology.
- Anaerobic digestion occurs when bacteria consumes organic matter in the absence of oxygen.
- This process produces two outputs: biogas (composed of methane, carbon dioxide, and trace other gases) and digestate.
- Anaerobic digestion applications:
 - Wastewater Solids Stabilization (i.e. waste sludges)
 - Farm Sourced Solids Stabilization (i.e. manure)
 - Source Separate Organics (i.e. food waste, fats, oils, grease, crop residue, etc.)

An Overview – H&D Properties Proposal for Maitland Property

- Property located at 1336 County Road 2, Maitland
- Made application to the Ministry of the Environment, Conservation and Parks (MECP) for an Environmental Compliance Approval:
 - Air & Noise Emissions
 - Waste Disposal Site – Processing Site
- As part of this application, the following documents were provided
 - Site plans
 - Emissions Summary and Dispersion Model
 - Odour Assessment
 - Noise Screening
 - Design and Operations Report
 - Stormwater and Leachate Management

H&D Properties Proposal for Maitland Property Site Plan

- Property Constraints
 - North Side: 30m setback to the Canadian National Railway
 - East Side: 30m setback to Well's Creek (as required by Renewable Energy Approvals Under Part V.0.1 of the Act (O.Reg. 359/09, Section 39(1)2)
 - South Side: O.Reg. 359/09 does not contain a setback requirement to sensitive receptors (refer to Odour Assessment)



H&D Properties Proposal for Maitland Property Emission Summary and Dispersion Model Report

- Emissions consist of nitrogen oxides (N_{ox}), sulphur dioxide (SO_2), particulate matter (PM), carbon dioxide (CO_2), methane (CH_4) and total reduced sulphur (TRS).
- Although odours are assessed separately, hydrogen sulphide (H_2S) and mercaptans should have been included in the emission model as they are common odourous compounds from food waste processing facilities.
- Model provided demonstrated that CO_2 emissions are 370% of the Ministry's POI Limit. Unsure how this will impact neighbouring industries.

H&D Properties Proposal for Maitland Property Odour Assessment (Page 1)

- Odour Assessment was provided to the MECP as part of their ECA application.
- Model is based on 2,000 odour units, but does not source examples to substantiate where this number comes from (i.e. industry standard).
- Model provided that the system will comply with the MECP point of impingement criteria (< 1 ou at human receptors).
- Odour assessment is related to the facilities to be constructed on site but does not include consideration for odours cause by trucking.
- Report indicates that digestate will be held off-site for storage and land application (no storage on site should be permitted).

H&D Properties Proposal for Maitland Property Odour Assessment (Page 2)

- Activated Carbon is to provide odour control.
- When activated carbon is spent (i.e. used-up) there is a potential for odour break-out (monitoring stack concentrations is part of their plan).
- Report does not discuss how facility will maintain negative pressure within the structures during activated carbon change-out. (If building is not kept under negative pressure there will be odour releases).
- MECP Reviewer commented that existing building needs to be smoke tested to demonstrate that the building is air-tight.

H&D Properties Proposal for Maitland Property Acoustical Assessment

- Noise sources included trucks, shredders, fans, blowers, compressors and flares.
- Proponent used the MECP Secondary Noise Screening Assessment to determine impact of noise on adjacent properties.
- The cumulative noise emission from all of the sources was 41 dBA.
(equivalent to a refrigerator in operation, computer fan, light rain, etc.)
- The MECP limit for this environment is 45 dBA.

H&D Properties Proposal for Maitland Property Design and Operations Report (Page 1)

- Section 1.1 Land Use

- Design and Operations Report states “ the lot is currently zoned as industrial (MP) and anaerobic digestion is an allowable land use.”

7.13 INDUSTRIAL PARK – MP
No person shall use any lands or erect, alter or use any building or structure in the “Industrial – M” except in accordance with the following provisions of this Section and of any other relevant sections of this By-law.

7.13.1 Permitted Uses

- Abattoir
- Accessory Retail Use
- Auction House
- Auto Body Shop
- Automobile Wrecking Yard
- Bakery
- Building Supply
- Catering Establishment
- Contractor’s Shop and Yard
- Custom Workshop
- Dry Cleaning Establishment
- Egg Grading Station
- Equipment Rental Establishment – Agricultural or Industrial
- Equipment Service and Repair Establishment – Agricultural or Industrial
- Equipment Storage Establishment
- Equipment and Vehicle Storage Yard - Industrial
- Equipment Sales Establishment – Agricultural or Industrial
- Feed Mill
- Fuel Depot
- Fuel Storage Area or Depot
- Garage Commercial
- Garage Municipal
- Gasoline Card Lock Facility
- Lumber Yard
- Manufacturing
- Mini Warehousing and Public Storage
- Open Storage
- Outdoor Display Area
- Printing and Publishing Establishment
- Recreational Vehicle Sales and Storage
- Recycling Depot or Transfer Station
- Salvage Yard
- Sawmill
- Transportation Depot
- Transportation Terminal
- Truck Stop
- Vehicle Agency
- Warehouse
- Welding Shop
- Wholesale Establishment

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7.15 WASTE DISPOSAL ZONE – WD
No person shall use any land or erect, alter or use any building or structure in the “Waste Disposal Zone – WD” zone except in accordance with the following provisions of this Section and of any other relevant Sections of this By-law.

7.15.1 Permitted Uses

- Agricultural Use (not including buildings and structures)
- Composting Facilities
- Forestry Use (not including buildings and structures)
- Recycling Depot or Transfer Station
- Waste Disposal Site
- Sewage and Water Systems
- Salvage or Wrecking Yard

7.15.2 Zone Requirements

<u>Minimum Yard Requirements</u>	
All Yard	30 m (98.4 ft.)

7.15.3 Additional Provisions

1. Influence areas shall be as required in Section 6.4L.
2. Waste to energy facilities shall be permitted subject to any required Provincial permit or authorization.
3. Other general provisions shall be in accordance with Section 6 of this By Law.

7.15.4 Exception Zones

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- The processes that are occurring on this site are deemed to be “waste processing”.
- I suggest obtaining a third party’s opinion of the suitability of the zoning of this property for this use.
- Please note: Section 7.15.3 of Zoning Bylaw allows waste to energy facilities in lands zoned “WD”.



H&D Properties Proposal for Maitland Property Design and Operations Report (Page 2)

- Section 2.1 Feedstock Reception
 - Discusses process of receiving feedstock at the facility.
 - Feedstock sources:
 - Liquid industrial commercial and institutional (ICI) feedstock
 - Solid ICI feedstock
 - Solid source separated organics (i.e. green curb-side pickup)
 - Clean odour-free solids (i.e. starch)
 - I'm unsure if the ECA will provide limitations to the feedstock (i.e. manure, septage, etc.)
 - Proposed two 3,000 m³ surge tanks for storage of feedstock.
 - Wash water from the trucks is captured and sent to the digester with the feed stock.

H&D Properties Proposal for Maitland Property Design and Operations Report (Page 3)

- Section 2.2
 - At full capacity the facility will produce:
 - 45,000 m³ of biogas (equivalent to approximately 26,000 m³ of renewable natural gas per day).
 - 540 tonnes of digestate.
 - Hydrogen sulphide production is a by-product of digestion (rotten egg smell):
 - System is designed to inject small quantities of oxygen into the system for desulphurization of the biogas.
 - Ferric chloride or ferric hydroxide can also be added to remove hydrogen sulphide.
 - Operating Pressure
 - Digester operates at 2" water column (0.072 psi).
 - At 4" (0.144 psi) water column, an alarm is sounded and feed to digester is discontinued and the digester is vented to the emergency flare.
 - At 8" (0.288 psi) water column, gas is vented from a pressure relief valve.

H&D Properties Proposal for Maitland Property Design and Operations Report (Page 4)

- Section 2.3 Digestate
 - Original plans were to have temporary storage of digestate at Dyno Nobel facility.
 - Based on H&D Properties presentation on December 7, 2021, they are arranging storage on agricultural properties instead.
 - No storage is to be provided on the site.
 - Township should insist that truck loading of digestate only occur within a closed building.
- Section 2.4 Odour Control
 - Facility will use activated carbon filters to control odour releases.
 - Trucks are to be equipped with activated carbon filters as well.
 - There are other technologies (i.e. ozone, biofiltration, incineration, etc.).
 - Suggest visiting a site where they have one in operation.

H&D Properties Proposal for Maitland Property Design and Operations Report (Page 5)

- Section 3.2 Site Storage of Feedstocks
 - 2 x 2 m³ Surge Tanks
 - 40 m³ Clean Reception Tank
 - 2 x 3,000 m³ Liquid Surge Tank
 - 2 x 2,500 m³ Hydrolyzer
 - 200 m³ Solids Silo
- Over 11,000 m³ of feedstock can be stored on the site.
- H&D Properties providing MECF with financial assurance of \$85,000 in the event they abandon the site.

H&D Properties Proposal for Maitland Property Design and Operations Report (page 6)

- Section 4.0 Test Procedures
 - Feedstock testing
 - Digestate testing
 - No air quality testing (although there is monitoring for specific parameters)
- Section 8.0 Decommissioning Plan
 - Equipment has a 20 to 30 year life expectancy.

H&D Properties Proposal for Maitland Property Design and Operations Report

- Section 9.0 Additional Plans
 - Operation and Maintenance Manual
 - Progressive Odour Management Plan
 - Emission Summary and Dispersion Modelling (ESDM) Report (complete)
 - Stormwater and Leachate Management Plan
 - Acoustic Assessment Report (complete)
 - Dust and Litter Plan (Indicate that it is not required)
 - Vector and Vermin Plan (Indicate that it is not required)

H&D Properties Proposal for Maitland Property

Questions that Need to be Asked

- Has the proponent obtained an agreement with Enbridge or Trans-Canada for the purchase of the purified biogas? What is the backup plan?
- At similar facilities, does the digestate need to be mixed with another media (i.e. sand) to be classified as an organic fertilizer under the Fertilizer Act. If so, where will this occur?
- There appears to be a significant volume of feedstock storage on site. What processes are in place to ensure that odours are not generated within these storage tanks?
- What is the status of the Nutrient Management Plan for the application of the digestate on agricultural properties?

H&D Properties Proposal for Maitland Property Site Visit

- CH Four Provided the Following References:
 - Reference 1
 - Facility: Petawawa Biofuels
 - Owner: Private
 - Location: Dundalk, Township of Southgate
 - Reference 2
 - Facility: Seacliffe Energy (currently undergoing major capital works)
 - Owner: Private
 - Location: Leamington, Ontario
- As odour seems to be a major concern voiced in the public open house, EVB will reach out to Biorem for similar installations which staff can visit.

Environmental Compliance Approval - Review

- The MECP has submitted correspondence to the Township requesting comment on the ECA application by January 7, 2022.
- EVB strongly recommends that any concern that the Township would like addressed be submitted to the MECP prior to this deadline.