

Petawawa Net Zero Project

Renewable Energy Approvals Application:
Project Description Report, Preliminary

Submitted to:

Ministry of Environment, Conservation and Parks
Renewable Energy Approvals Branch

Submittal Date: 21 July 2020

Applicant: The Corporation of Town of Petawawa

Operating Authority: Ontario Clean Water Agency

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1. General Information

1.1 Name of the project and applicant

The Petawawa Net Zero project (Project) will transform the existing Petawawa Water Pollution Control Plant (WPCP) into a Resource Recovery Facility by upgrading its anaerobic digesters to divert waste from landfill and boost biogas production for use as electricity, making the plant energy neutral or positive, and reducing GHG emissions. This will involve the utilization of biogas for Combined Heat and Power (CHP) Units for the purpose of making the WWTP Net Zero. The project also aims to find beneficial usage of remaining biogas as clean fuel.

The Project has previously undergone stakeholders outreach under the name of “Petawawa Co-digestion and Energy Generation Feasibility Study” in 2019.

The project has received a grant of \$2.7 Million from Low carbon Economy Challenge Fund in November 2019 under name “Petawawa Wastewater Treatment Plant (WWTP) Energy Recovery and Waste Diversion Net Zero Project”.

1.2 Project location

The Project is situated within the Petawawa Water Pollution Control Plant, located at 560 Abbie Lane, Petawawa, County of Renfrew, K8H 2E6 (Site). The Site has an area of 75.3 acres and is registered as Range Lake Lot 17 RP, Petawawa, County of Renfrew; roll number 477907902006900.



Figure 1 General Site Location

1.3 Proposed energy facility

An anaerobic digestion facility is defined in O.Reg. 359/09 as a renewable energy generation facility at which biogas made from anaerobic generation is used to generate electricity. Under this definition, the biogas must be generated at the facility; where not located on a farm, this would be considered a Class 3 anaerobic digestion facility.

Nameplate capacity of the proposed Combined Heat and Power (CHP) facility will be approximately 200 kWe at the 30% design phase. Exact capacity will be finalized in 100% design.

1.4 Contact information

This Project is being undertaken in partnership, with the Town of Petawawa as the site owner, OCWA as operating authority and project manager, and Anaergia as the consulting engineer and technology provider. The project will be delivered under alternative delivery model with investments from all 3 parties.

The primary project contacts are as listed below:

- Mr. David Unrau, Director of Public Works, Town of Petawawa. (dunrau@petawawa.ca)
- Mr. Indra Maharjan, Director of Innovation, Technology and Alternate Delivery, Energy, Climate Change and Resource Recovery, Ontario Clean Water Agency (imaharjan@ocwa.com ; 416-775-0056)

1.5 Other approvals required

It is expected that a revised Environmental Compliance Approval will be developed as a result of the changes to the WPCP entailed by this Project as well as other unrelated ongoing process improvement projects. The digester units will have to meet the order issued by Technical Standards and Safety Authority (TSSA) by 2022.

The proponent is also undergoing the Connection Impact Assessment process with Hydro One currently, with the expectation of a future Distribution Connection Agreement for the Project as a part of net metering contract.

Local municipal building permits will be obtained as required.

The Site does not appear to be under the jurisdiction of a conservation authority (see below map from Conservation Ontario, where site is represented by the black dot).

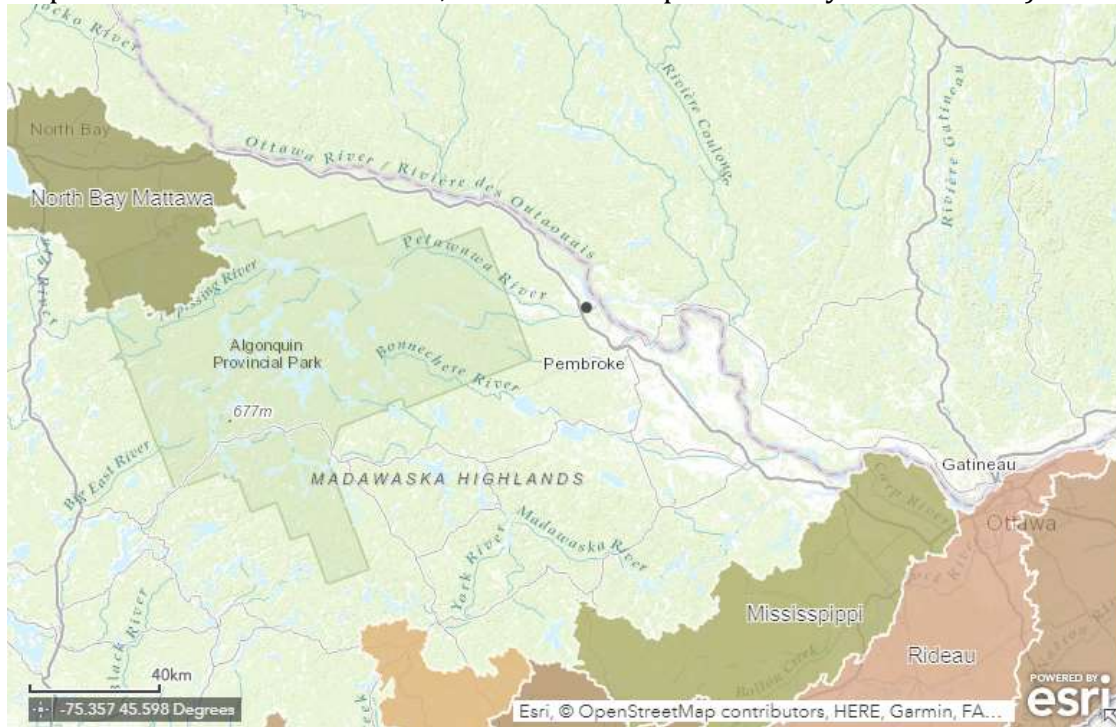


Figure 2 Conservation Authority Coverage (Conservation Ontario, 2020)

1.6 Federal involvement

The project is supported by the federal government's Low Carbon Economy Challenge program. The LCEF program has approved a grant of \$2.7 Million for this project.

2. Project Information

The Project involves upgrading the existing AD digester technology with new innovative technology to convert the WPCP from its traditional treatment-based process to a Resource Recovery process, achieving the goal of being an Energy Net Zero Plant. The proposed Project involves upgrading the plant's existing anaerobic digester(s), improving the digestion efficiency of the WPCP sludge and allowing additional biosolids and organics (from food waste or fats, oils and grease) to be brought into WPCP from the Town and neighboring wastewater plants as well as other biosolid producers (breweries, commercial, restaurants, etc.). Biogas generated through the anaerobic digestion process would be used to produce renewable energy on-Site through Combined Heat and Power (CHP) Engines and other beneficial use of biogas.

2.1 Facility components

The Project is comprised of four component groups:

1. Incoming Organics Reception & Processing
2. Anaerobic Digestion Upgrades and New Equipment
3. Digestate Management
4. Biogas Utilization

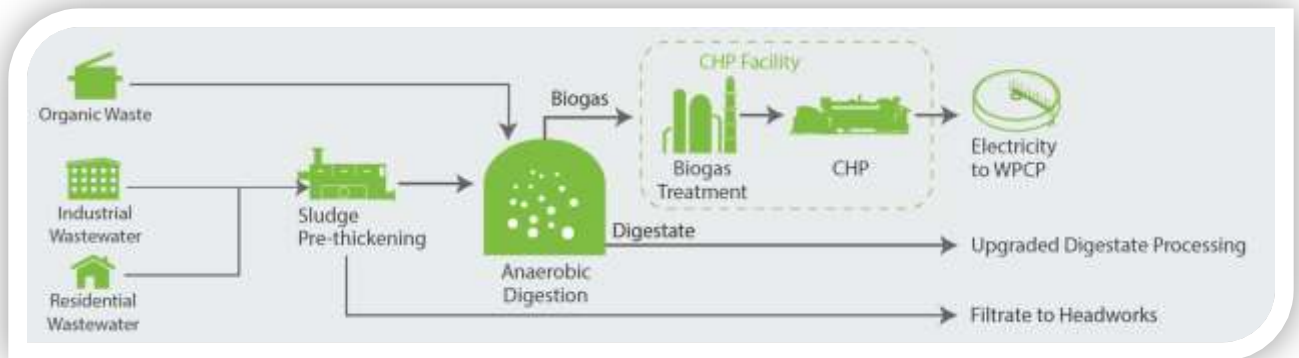


Figure 3 Conceptual Process Flow

On-site Project equipment is anticipated to include:

- Slurry Reception Quick-Connect
- Rock Trap
- Grinding/Screening Equipment
- Dedicated Insulated & Heat-Traced Organics Reception Tank
- Organics Slurry feed to Anaerobic Digestion
- Sludge Screw Thickener (SST) equipment
- Anaergia PSM High-Solids Mixers
- Replacement of existing Anaerobic Digester Roof
- Upgrades to existing biogas system

Specific proposed equipment is as shown on Anaergia's Equipment & Instrument Lists

2.2 Project activities

The Project is set up in two phases:

Phase 1

- Upgrades to existing digesters to co-digest biosolids and external food waste to produce renewable energy;
- installation of Combined Heat & Power (CHP) Engine to produce electricity to offset plant electrical demand.

Phase 2

- Augment digestate management with dewatering to reduce digestate loadout volume;
- Implementation of side-stream management system to treat filtrate generated from dewatering;
- Explore options for additional beneficial use of excess biogas

The overall Project timeline is as follows:

- September 2019: Finalization of Technical options and approach
- January 2020: Project Development & Finalize Budget, Partnership & Project Financing Approach
- November 2020: Finalize Detailed Process, BoP & Construction Engineering
- January 2021: Procurement & Construction
- December 2021: Commissioning, Ramp up and Performance Testing []

There might be delay in the execution of the project due to COVID-19 restriction in the province since March 16th 2020.

Air and Noise emissions may be generated through the operation of the CHP Facility, but this will be a fully containerized system to ensure noise attenuation. Exhaust air emissions will be treated as part of the CHP package.

It is intended that the solids produced from this project (Biosolids) will be managed in accordance with NASM guidelines. For Phase 1, digestate management will be maintained per current methods utilized at the facility. In subsequent phase of project the team will explore options for dewatering of the digestate as well as supplementary treatment of the resulting filtrate. In phase 1, liquids produced by the project (Filtrate from pre-thickening) will be sent to the plant headworks and treated prior to discharge.

Some contaminants (rocks, grit, plastics, etc.) may be removed from the incoming organics stream in the reception skid, which is intended to be sent to landfill for disposal.

Disposal plans for any toxic or hazardous materials to be used or any by-products to be generated while engaging in the project and a storm water management plan will be developed as part of the future Design and Operations Report for this project.

No water-taking from ground water or surface water is anticipated at the Site. The WPCP will provide for reasonable potable water usage for general personnel hygiene. Constructor would be expected to arrange for their own water supply or request on per-case basis from hydrant for any substantial water usage such as transport equipment and tanks wash-down's & flush-out's. The source and consumption of water used to create organic feed slurry off-Site will be determined at a later stage of the design process in the Design and Operations Report, and this document updated accordingly.

2.3 Map of project location

The Site where the Project is located is within the boundaries of the Petawawa Water Pollution Control Plant, please refer to Figure 1. A more detailed map with supplementary details (e.g. off-site land uses within 300m of project location, natural features, municipal drains, area contours, and presence of wells) will be provided as the Project progresses.

2.4 Land ownership

The Corporation of the Town of Petawawa owns the property upon which the Petawawa WPCP and the proposed Project process components will be situated.

Arrangements regarding off-site processing of waste have not been confirmed at this time. The plan is to establish commercial agreement with commercial waste supplier to secure the required quality and volume of organics during phase 1 of the project.

3. Likely environmental effects

The project is aimed to reduce significant GHG emissions resulting from diversion of food waste from landfill and emission of methane to environment through the generation and utilization of biogas to produce renewable electricity via a Combined Heat & Power (CHP) Facility.

3.1 Heritage and Archaeological Resources

The Town of Petawawa did not note any pre-existing historical and archaeological assessment reports on record. Further information will be included in future drafts upon discussion with MECP REA review engineer.

3.2 Natural Heritage

The Natural Heritage Assessment is not yet completed at this stage of the Renewable Energy Approval (REA) application. Further information will be included in future drafts upon discussion with MECP REA review engineer.. The Town of Petawawa did not note any pre-existing natural heritage assessment reports on record.

3.3 Water Bodies

The WPCP currently discharges treated wastewater effluent approximately 300m from the shore of the Ottawa River at an approximate depth of 2.5m below the surface. Liquid effluent from the Project would be returned to the WPCP as a sidestream, treated through the wastewater treatment process, and be discharged as treated wastewater effluent.

A summary of key elements of Stormwater Management Plan, Erosion and Sediment Plan and Traffic Management Plan will be provided in the Project Description Report, once prepared as part of the Design and Operation Report for the REA. While the Site is adjacent to the Ottawa River, the Project's physical components will be located at minimum of 150m

away from the river, meeting requirements in subsections 39 (2) and 40 (2) of O. Reg.359/09.

Spills are a risk during Project construction and implementation. The current WPCP's contingency response plan will be utilized to respond to spills; further Project-specific mitigation and response measures will be submitted as part of the REA application and included in the WPCP's contingency response plan updates.

3.4 Air, Odour, Dust

Ideally, all organics brought to the WPCP will be as a liquid or slurry (pumpable) media, with only a short term of exposure to atmosphere during pumping connection, thereby mitigating odour dispersion during reception at Site.

All new and/or modified process tanks will be enclosed, as well as all feedstock and digestate reception and loadout equipment will be enclosed to avoid odour migration. Carbon air filtration with spare units shall be connected to all of these tanks to absorb odourous compounds. Similar measures would be undertaken in any off-Site pre-processing trains.

The consulting engineer shall undertake odour modeling for the Site to further refine requirements along the design process.

The plant has put in place a robust odour complaint and response process in case of odour issues for public. As of now, there is no record of any odour complain for last 10 years.

3.5 Noise

Increase in noise levels is expected to likely occur from the emission of noise on noise receptors in the vicinity of the project are primarily expected to stem from two sources, namely 1) equipment operations and 2) traffic of heavy vehicles, during construction and implementation phases. Traffic is discussed further in Section 3.7 below. While the majority of equipment should be housed indoors, start-up or malfunctions of equipment may result in above average noise levels. Mitigation measures will include muffling, noise isolation and signage installation as appropriate.

The consulting engineer shall undertake noise assessment for the Site to further refine requirements and mitigation measures along the design process.

The Town will develop traffic calming plan and schedules around organics and other delivery in the plant.

3.6 Land Use and Resources

As shown in Section 2.3, there would be no land use changes for the Site resulting from the Project.

Negative environmental effects are not expected to other resources; conversely, landfill site loading is expected to be alleviated by the Project's processing of organic waste.

Land use for off-site processing of organics has not been confirmed at this time. The Town is in discussion with Ottawa Valley Waste Recovery Centre for potential usage of their facility for this purpose in long run.

3.7 Provincial and Local Infrastructure and Interests

Two rounds of stakeholder outreach have been undertaken in March 2019 and May 2020, whereby project updates were provided and inputs solicited. Stakeholders canvassed include adjacent municipalities and local businesses which may be feedstock providers. Future outreach will include consultation with local Aboriginal communities and the general public.

The site is fenced and the development will occur in the fenced area. It will not affect any hiking trails, recreation, etc.

Effects on local interests, land and infrastructure are primarily associated with increased traffic to and from Site. It is estimated there will be additionally one tanker per day, 250 days per year, to deliver incoming organics feedstock to Site. Prior to further digestate processing measures (to be determined in Phase 2), outgoing digestate is estimated to create traffic of approximately 10 trucks/day, for two to four weeks per season in spring and fall for land application of digestate. This is as compared to the approximate 130 trucks/year for outgoing sludge haulage in 2015-2018.

A Traffic Management Plan will be developed to further refine requirements along the design process and provide mitigation measures. All trucks bringing in external waste will be enclosed tanker trucks. All trucks transporting biosolids away from the facility will be enclosed.

3.8 Public Health and Safety

The Project will be situated entirely within the Site which, as an operating WPCP, has restricted access. The location of Project-specific equipment are well set-back, with at minimum 60m distance between the closest process unit (existing digestate/biosolids storage tank) to the nearest neighbouring property. Members of the public are not expected to come into contact with any Project components. The public is able to contact the WPCP and project proponents via multiple channels according to current complaints handling procedure as well the WPCP contingency notification procedure; these procedures may be updated as a part of the Design and Operations Report submittal.

Project design and operating procedures will be in compliance with pertinent aspects of the Occupational Health & Safety Act, Ontario Fire Code, National Fire Protection Association standards, Canadian Electrical Code, and Ontario Building Code to in order to protect the health & safety of on-Site staff and contractors.

3.9 Areas Protected under Provincial Plans and Policies

The Site is not located in the Lake Simcoe Watershed, or subject to the Niagara Escarpment Plan, or the Oak Ridges Moraine Conservation Plan. The Site is also not located in the Protected Countryside area defined in the Province's Greenbelt Plan.