



PROJECT DESCRIPTION REPORT (PDR)

[The numbers in brackets refer to sub-sections of Technical Guide to Renewable Energy Approvals (2011)]

***DRAFT – August 9, 2010
Last Revised - October 15, 2012***

Section 1 – General Project Information and Contacts

Project Name [3.1]	Penn Energy - Roseplain
Project Description [3.3]	6,500 kW Solar PV Renewable Energy Generation Facility (“REGF”)
Project Location [3.2]	5240 CONCESSION 4, RR #1 Goodwood, Town of Uxbridge, RM of Durham, ON L0C 1A0
OPA FIT Application No.	FIT-F7TMB91
Applicant [3.1]	Penn Energy Renewables, Ltd. 1 Yonge Street, Suite 1801, Toronto, ON M5E 1W7
Project Contact [3.4]	Max Frable max@pennenergyrenewables.com 620 Righters Ferry Road, Bala Cynwyd, PA, USA 19004 Office: 610-668-0300 Fax: 610-668-0365

Section 2 – Are Any Related Authorizations Required?

Conservation Authority (CA) [3.5]	No. As part of the Natural Heritage Assessment (NHA), Penn has consulted with .Lake Simcoe Conservation Authority (LSCA). LSCA provided comments to be considered in the NHA and stated that a permit would not re required in a letter dated September 20, 2011. <i>See Section 4 for more details.</i>
Ministry of Natural Resources (MNR) [3.5]	Confirmation Required - A Natural Heritage Assessment prepared by Niblett Environmental Associates, Inc. has been confirmed by the Ministry of Natural Resources, Aurora District. <i>See Section 4 for more details.</i>
Ministry of Tourism & Culture (MTC) [3.5]	Concurrence Required - MTC has concurred with the recommendation for site clearance in a Stage 1-2 Archaeological Assessment, prepared by Northeastern Archaeological Associates, Ltd. <i>See Section 4 for more details.</i>
Ministry of Transportation (MTO) [3.5]	Unlikely; the property does not appear to abut an MTO-jurisdiction roadway, but Applicant anticipates consulting with the MTO nonetheless.
Federal Involvement: [3.6]	
Canadian Environmental Assessment Agency (CEAA)	No federal authority is the proponent of the project or providing financial assistance to the proponent; no federal lands are being sold, leased or otherwise disposed; no requirement for a federal permit, license or other approval is

	anticipated.
Pending or Decided Federal Environmental Assessments (EA)	No known Federal EA regimes exist related to this site.
Fisheries & Oceans Canada (DFO) <i>Fish and Fish Habitat impacts requiring review beyond local CA; Fisheries Act authorization; or under jurisdiction of Canadian Environmental Assessment Act (CEAA), or Species at Risk Act (SARA)</i>	No water bodies are apparent on site of proposed REGF.
Environment Canada <i>Migratory Birds and/or Habitat</i>	The majority of the site is currently not wooded and used for farming. While it is currently unknown if and how migratory birds and/or their habitat will be impacted, screening reports will be requested from the South Lake Simcoe Conservation Authority; based upon their findings and recommendations, we will conduct additional studies as requested. <i>See Section 4 for more details.</i>
Parks Canada <i>Federal Lands owned by Parks Canada</i>	The REGF does not occur on or over federal land owned by Parks Canada. It does not appear that there are any national parks, reserves, historic sites, historic canals or national marine conservation areas nearby that will be negatively impacted by the REGF.
Natural Resources Canada (NRCan) <i>Funding assistance</i>	No funding is being sought from NRCan for this project.

Section 3 – Specific Project Information

Facility Class [3.3]	Class 3 Solar PV (Ground-mounted, >10 kW)
Nameplate Capacity [4.1]	6,500 kW (AC, peak)
Energy/Fuel Sources [3.3]	The Sun (No fuel or raw material is required; no by-products, waste or pollution are generated during the process.)
Electricity Generation Components [4.1] <i>Since supplier contracts remain to be finalized, this information is subject to change. We anticipate components will not substantially differ from those listed herein. [1 mW (AC) = approx. 5,500 panels]</i>	A single photovoltaic (PV) module is approximately 1m x 1.65m and consists of numerous crystalline-silicon cells arranged in a grid and laminated between electrodes and enclosed within a glass and aluminum frame. Modules are grouped into arrays which are aligned in east-west rows; the rows are separated by access aisles, approximately 5 meters in width. The array field (“project area”) for this site will consist of approximately 36,000 PV modules and will include 7 or more modular collection houses that will contain inverters and transformers. Power generated by PV modules is low-voltage, direct current (DC) and will be collected and converted into alternating current (AC) by inverters located inside the collection houses throughout the array field. The AC power flows through one or more transformers to increase its voltage to match the local electricity distribution system (typically 44 kV or 27.6 kV). Metering and safety equipment is required and allows the distribution/transmission operators to remotely control the power grid interconnection to ensure safe and reliable operation – especially during power outages and disruptions.
Associated Facilities/Equipment [4.2]	The entire project area will be enclosed with a security/safety fence; a perimeter driveway will be located adjacent to (inside) the fence; additional driveways will pass through the array field and provide access to the collection houses. Electrical collection and distribution lines will consist of underground and/or overhead lines and will connect to the power grid at a nearby distribution line. No new utility services are anticipated at this time.

Project Activities: [4.2]	
Describe any regulated activities (construction, installation, use, operation, changing and retiring)	<p>The solar module arrays will be mounted on a series of metal framing elements that are sloped (facing south) to optimize exposure to the sun (maximum height is approximately 4 meters above the ground). The foundation system consists of similar framing elements that are driven, screwed, or cored-and-grouted into the ground (depending upon existing soil conditions). As mentioned above, a driveway surrounds the project area and provides access throughout the array field and to all the collection houses. (Only minor re-grading is anticipated.) Indigenous grasses/groundcover will grow beneath and between the rows of solar arrays, which will minimize erosion and enhance infiltration of precipitation into the soil. Because there are gaps between the modules as well as wide spacing between the arrays, little (if any) impact to the existing natural storm-water drainage is anticipated.</p> <p>Besides construction of driveways, installation of panels, framing, foundations and the collection houses, the remaining work is mostly electrical (collection lines, inverters, transformers, etc.).</p> <p>Once construction & installation is complete (including testing and commercial operation initiation), regular light maintenance is required. Site visits will be conducted for minor site maintenance and inspection of electrical and non-electrical components. Additional visits will occur as necessary (e.g. to replace panels, wiring or other components).</p> <p>One extremely beneficial characteristic of this project is the installed components have almost no long-term or permanent impact on the site. In fact, they can all be removed after the solar panels have fulfilled their life-expectancy (20-30 years) and the site can virtually be returned to its natural state – very much as it exists today. This means the site could again be utilized for agricultural purposes or any other use deemed appropriate at that time. (Very little evidence, if any, that a solar farm ever existed would remain.)</p>
Describe facility phases and timing / scheduling of each phase (e.g. time of year, frequency and duration)	Entire REGF will be constructed & installed in one phase; anticipated duration is approximately 6 months and will likely commence in Spring or Summer.
Identify the nature of any solid, liquid or gaseous wastes, air and noise emissions likely to be generated; describe plans to manage any wastes	No solid, liquid or gaseous wastes, nor air emissions will be generated by the REGF. Minimal noise will be emitted from electrical conversion equipment (inverters and transformers), and an acoustic assessment will be conducted according to REA requirements in O.Reg. 359/09.
Describe disposal procedures for any toxic or hazardous materials to be used or byproducts to be generated	No toxic or hazardous materials will be used or generated, so disposal procedures are unnecessary.
Describe sewage and stormwater management	<p>No sewage will be generated.</p> <p>The project will have only minimal impacts to the site and therefore minimal impacts upon the flow of stormwater. The solar arrays can usually follow existing grades. The only point of contact between each array of solar panels and the earth are the posts upon which the arrays are mounted. Other site improvements are minimal (collection house foundation pads, service driveway, etc.). There should be virtually no change to the way that water flows on the site.)</p>

Describe any water-taking activity	None anticipated. Penn anticipates the highest water demand will occur during cleaning of the modules. The duration of the module cleaning scope of work is approximately one week. It is anticipated that the module cleaning process will use not more than 30,240 liters of water per day on any day. . A hydrogeological report by Levac Robichaud Leclerc Associates Ltd., dated January 2012, confirms such taking would have “no significant impacts on the local hydrogeological regime.”
Land Ownership [4.6]	REGF site is privately owned (no Crown or Federal lands involved)
Legal description [4.6]	PT LT 22, CON 3, UXBRIDGE AS IN UX14403 & UX15360 (FIRSTLY) EXCEPT D142493 TOWNSHIP OF UXBRIDGE

Section 4 – Potential (Negative) Environmental Effects

Cultural Heritage & Archeological (MTC) [5.1]	In respect of Protected Properties, Unterman McPhail Associates (UMA) of Toronto, ON has screened the property and verified that the proposed project is not located on nor does it abut any protected properties as described in Column 1 of the Table to section 19 of O.Reg. 359/09. UMA also verified there are no other heritage resources at the project location (in addition to defined protected properties). Additionally, a Stage 1 and 2 Archaeological Assessment Report was been prepared by Northeastern Archaeological Associates of Port Hope, ON and submitted for review by MTC. MTC concurred with the reports recommendation for full site clearance in a letter dated September 28, 2011
<p>Natural Heritage (MNR) [5.2] <i>Woodlots, valleylands, wildlife habitat, provincial parks, conservation areas & reserves, flora/fauna species of concern & habitat, protected natural areas (e.g. ANSI), and locally important or valued ecosystems or vegetation...within 300m of RE project</i></p>	<p>REGF is not located within 120m of a Provincial Park or Conservation Reserve; REGF is not within 120m of a Natural Feature other than ANSI-earth science; REGF is not within 50m of ANSI-earth science.</p> <p>The REGF <u>is</u> located in a Protected Countryside Area in the Oak Ridges Moraine, (see Provincial Plan Areas below.)</p> <p>The REGF is not on or near sand barrens, a savannah or a tallgrass prairie; and the REGF is not near a seepage area, kettle lake or perennial or intermittent stream. The REGF also appears to be located in the Lake Simcoe Watershed. The REGF, however, will not alter the shore of Lake Simcoe, the shore of a fresh water stream hydrologically connected to Lake Simcoe, and is not located near the shoreline of Lake Simcoe or in a riparian area of the Lake.</p> <p>The REGF is not located within 120m of a Provincial Park or Conservation Reserve nor within 50m of ANSI-earth science.</p> <p>The subject property does contain significant woodlots. The RGEF’s Project Boundary has been amended to provide a buffer to significant woodlots that are located on and adjacent to the subject property. The NHA report prepared by Niblett Environmental Associates, Inc. of Lindsay, ON has recommended the implementation of Vegetation Protection Zones within 30m of these woodlots as well as any identified significant wildlife habitat</p> <p>Generalized significant wildlife habitat is not found within the project location but is found within 120m. Construction and operation activities will not occur within these areas.</p> <p>Species of Conservation Concern are not found within the project location but is</p>

	<p>found within 120m. Construction and operation activities will not occur within these areas.</p> <p>Additional survey for Raptor Wintering Area will be conducted in 2013 to confirm absence/presence of such. An Environmental Effects Monitoring Plan (EEMP) shall be instituted should the survey find such area exists and is significant.</p> <p>A NHA was submitted to the MNR for their review and was confirmed on October 5, 2012.</p>
Water Bodies (CA, MNR) [5.3]	A Water Assessment has been prepared by Niblett Environmental Associates, Inc. There are no water bodies within the Project Location or an adjacent property
Air, Odour, Dust [5.4]	No odors or dust emissions are produced from the solar power generation process.
Noise [5.5]	Minimal sound is emitted by the solar power generation process. The panels, racking and wiring – which comprise the majority of the REGF components – produce virtually no sound. The inverter and transformer, however, do produce some noise. This equipment was studied in accordance with O.Reg. 359/09 and by HGC Engineering of Mississauga, ON. Their acoustic assessment report was prepared according to Appendix A of the MOE’s “Basic Comprehensive Certificates of Approval (Air) – User Guide”, dated April 2004. As evidenced in the report, the prescribed noise limits will be adhered to via careful siting of the suspect equipment adequately distanced from any receptors.
Land Uses [5.6] (past & present; onsite & nearby)	No negative effects on current land uses or resource availability are anticipated. The proposed REGF site is undeveloped – except for a house and barns. Much of the land has been previously cleared for crop purposes. With the exceptions of several residences (some as a part of farming operations) on Concession Road 4 and Wagg Road and a quarry to the North, much of the surrounding lands are undeveloped.
Provincial & Local Infrastructure [5.6]	No negative environmental effect is anticipated on provincial and local services and infrastructure. The REGF will likely require no new utility services. While there will be a temporary increase of truck traffic on local roads during the few months of construction, there will be almost no traffic generated by this REGF once construction is complete.
Livestock Impacts [5.6]	Per Ontario Energy Board standards, the project perimeter will be fenced, limiting potential for livestock to enter the facility
Public Health & Safety [5.8]	No negative environmental effect on public health and safety is anticipated. In fact, there are numerous <u>benefits</u> provided by generating solar power, which is why the provincial government is encouraging it. The facility will be surrounded by a fence for safety and security.
Provincial Plan Areas [5.9] (Greenbelt, Oak Ridge Moraine, Niagara Escarpment, Lake Simcoe Watershed)	The REGF is located in the Oak Ridges Moraine (ORM) and within the Oak Ridges Moraine Conservation Plan (ORMCP). The REGF has been modified to maintain a minimum 30m buffer for ORM significant woodlands. The ORMCP identifies the site as being in an area of low and high aquifer vulnerability. The solar panels will not inhibit water from infiltrating back into the ground and all precipitation will be infiltrated back into the ground onsite to maintain the recharge and discharge functions of the area and groundwater contributions the watercourse to the east. To that end, the REGF will not have an adverse effect over the identified area as an Area of High Aquifer Vulnerability.

Section 5 – Project Location Map



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PENN ENERGY RENEWABLES, LTD.