LINDSAY SOLAR

Perpetual CleanPower Lindsay Solar Farm

Draft Project Description Report

April 13, 2011

Project No. 101-17808

GENIVAR

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1. Project Description Report

1.1 Proponent

The project is being developed and operated by Perpetual Energy Systems, LLC. (PES)

1.1.1 Project Contact

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1.2 Project Overview

Perpetual Energy is proposing a single Class 3 Solar Facility with a nameplate capacity of 10 MW (AC) in the area of Lindsay, Kawartha Lakes County, Ontario. If approved, this facility will convert solar energy into electricity to be fed into the Hydro One distribution grid. The preliminary project area is presented in Figure 1 (Appendix A).

Subject to receiving all approvals, the preliminary schedule anticipates that full commercial operation will be achieved by mid 2012. The project has received a 20-year Feed-in-Tariff contract from the Ontario Power Authority to sell the generated electricity to the Ontario electricity grid. As such, the project is anticipated to operate until at least 2032, at which time in may continue to generate electricity or the site may be decommissioned and the land returned to its former vacant use.

1.3 Project Location and Land Ownership

The project is located on Pleasant Point Road along the south side of Sturgeon Lake, north-east of Lindsay, in Kawartha Lakes County. The area is generally bounded by Pleasant Point Road to the east and Black Road to south.

The solar farm will be located on privately owned land. The project's electrical substation will also be located on site. One overhead electrical connection line would run to the Hydro One distribution line on County Road 36.

1.3.1 Land Ownership and Parcel Description

The table below lists the legal description of the parcels which will be used for the proposed Perpetual Energy Lindsay Solar Farm.

Ownership (Public or Private)	**Parcel Description**
Property Located in Kawartha Lakes County	
Private	Concession 9 – Pleasant Point Road, Part Lots 3 & 4

1.4 Authorizations Required

It is anticipated that in addition to the REA, the Perpetual Energy Lindsay Solar Farm project will need an Authorization to Proceed by the Ontario Power Authority, building permits from Kawartha Lakes County, permits from the Electrical Safety Authority (ESA) and the Ontario Energy Board (OEB) and possibly permits from the Kawartha Conservation Authority.

1.5 Project Facility and Equipment

The major components of the proposed project are as follows:

- → approximately 41,785 Suntech solar panels (280-watt dc typical generation capacity)
- → 20 Disconnect combiners
- → 44 kV Substation including pole-top motor-operated disconnect; 44 kV switchgear; revenue grade PT's, CT's and metering; 10 MVA oil filled pad-mount transformer; interrupter switches, communication equipment, etc.
- → 16 x 625-kW inverters (two inverters for each 1.25-MW block) and corresponding 1000-kVA transformer)
- → Access driveways
- → Temporary staging areas for the installation of the solar panels

1.5.1 Solar Photovoltaic Modules

The proposed solar PV technology to be used on this project will be Suntech 280-Watt modules. There will be a total of approximately 41,785 modules, each approximately 2 m long x 1 m wide. The modules will be held by a fixed system which is supported off the ground by vertical posts. Racks will be arranged into north-south rows each approximately 111 m long and 3 m wide.

All components are certified for application in a solar farm generation configuration.

1.5.2 Electrical System

The solar farm will connect to the Hydro One distribution line on County Road 36. DC power collected from modules will be directed to approximately 8 inverter/step-up transformer units placed on concrete pads. The AC power from the step-up transformers will be collected via 12.47-kV buried lines and connected to the main substation. This substation will include a transformer (12.47 kV to 44 kV) and associated switchgear and will be on a concrete pad. An overhead line will transfer the 44-kV power to the point of interconnection.

The project will be designed in full conformance with all applicable electrical, building and other codes.

1.5.3 Access Roads

Gravel driveways within the project site will be constructed to provide access to the equipment during the construction phase and later for maintenance access over the project's 20-year minimum life.

1.5.4 Communications and SCADA

It is proposed to provide Supervisory Control and Data Acquisition (SCADA) functions for remote supervisory monitoring and control. This system allows data on performance of the arrays, inverters, substations and weather conditions to be recorded and displayed at a control station, and also provides warnings if there are abnormal conditions. If required, a single 30-m tall communications tower will be constructed to facilitate communications, if required.

1.6 Renewable Energy Generation Facility Class

Under O.Reg. 359/09, this project is classified as a Class 3 Solar Facility.

2. Project Activities

The project will be composed of the following general activities:

Land Acquisition

Planning

Permitting

Detailed Design

Construction

Operations

Decommissioning

2.1 Construction Activities

2.1.1 Surveying and Geotechnical Activities

Surveys will be required to accurately locate the racking, inverters, access roads, electrical lines and the substation. Crews will drive light trucks to reach sites primarily using existing roads. They will then walk the site for the surveying and mark the locations using stakes.

Geotechnical sampling will also be required. This will be undertaken by a track-mounted drill rig which will drill boreholes to determine soil and/or rock characteristics. This will take approximately 1-2 days.

Existing buried infrastructure located on public property will be located using the Ontario One Call service and buried infrastructure located on private property will be located by private contractors prior to construction or geotechnical sampling and updated throughout construction, as required.

2.1.2 Roads and Land Clearing

No permanent paved roads will need to be constructed for the solar farm. Municipal and provincial roads will be used for transportation of equipment to the construction sites. Minor modifications might be required to some of the existing roads (for example, widen the turning radius) for equipment transportation. Any road damages will be repaired.

On-site access to the array will require new internal roads/driveways. Following completion of the construction phase, the internal driveways will be used for maintenance activities for the duration of the facility's operation.

The construction of the internal driveways typically requires excavation of the top soil layer and adding a layer of compacted material to a typical thickness of 300 mm (depending upon site specific geotechnical conditions). Clean granular material (typically "A" or "B" gravel) will be brought to the site on an as-needed basis and will not be stockpiled onsite. The topsoil will be kept and re-used on site. New culverts may be required to maintain drainage in ditches and these will be constructed sufficient to support the construction equipment and delivery trucks. The exact culvert details (if any are required), installation details and erosion-control measures will be determined in conjunction with the Kawartha Conservation Authority as a part of their permitting process.

2.1.3 Construction Laydown Area

A portion of the site will be used for the temporary storage of construction material. The topsoil at the Construction Laydown Area will be removed and approximately 600 mm of clean compacted crushed gravel will be imported on an as-needed basis. The excavated topsoil will be re-used on site as feasible.

2.1.4 Site Preparation and Inverter Pad Construction

Prior to construction, the construction area will need to be cleared, grubbed and fenced. The topsoil is typically removed and some material may need to be added depending upon site specific geotechnical conditions. During clearing or excavation, if any significant archaeological resources are found to be in conflict with the proposed facilities, then consideration will be given to modifying the location of the

construction. This will be determined in consultation with the Ministry of Tourism and Culture and registered archaeologists. The sire will be surrounded by an animal friendly chain-link fence approximately 2 m tall for site security. The fence post holes will be augered and the fence posts placed into concrete and allowed to set. Once the posts have set, the metal chain link fence will then be secured. The fencing used will allow the free passage of small animals but prevent access to large animals and humans.

Inverter pads will be constructed at the same time as the internal driveways and will typically be 14 m x 5 m in size. The topsoil at the inverter pad will be removed and approximately 600 mm of clean compacted crushed gravel will be imported on an as-needed basis. The pads will be constructed of poured concrete reinforced with rebar. The excavated topsoil will be re-used on site as feasible.

2.1.5 Delivery of Equipment

Equipment will be delivered by truck and trailer as needed throughout the construction phase and stored at the temporary lay-down site. A traffic management plan will be developed using MTO Book 7 standards.

2.1.6 Installation of Racking System

The Solar Array racking system will consist of a fixed system with the solar modules affixed to a supportive metal rack. The rack/array is then connected to the ground via piles. Variations on the rack connections to the ground are essentially variations on a common theme, and are dependent on the mount type (fixed/tracking) and the geotechnical conditions – regardless of connection method, the piles will be buried.

The general procedure for rack installation varies slightly depending on geotechnical conditions as outlined above, but essentially follows the following procedure:

piles are either vibrated, driven or screwed into the ground, to specified/engineered depth*

in cases where special foundations/footing/boreholes are required, *temporary* soil excavation and/or drilling will be required to expose subsurface conditions and prepare them for pile insertion*;

soil directly beneath the future racking/surrounding inserted piles is compacted and covered with crushed engineered fill (and further compacted/settled); and

racking, hardware and module assembly are built over top the piles.

*The preferred pile installation method is via a vibratory system, with no pre-excavation requirements. However, if subsurface conditions are less favourable, subsurface pile work may include borehole pre-drilling, rock grouting and/or cement casting. Once the piles are secured in the ground, the excavated soil will be re-filled and steps 2 and 3 above are completed.

2.1.7 Solar Panel Assembly and Installation

This portion of the work is labour intensive and requires significant manual assembly. An array row typically holds up to 100 modules, and a 10-MW solar farm can have as many as 400 array rows. With the exception of light crane trucks and flatbed trailers (storage and module transfer), the assembly work is essentially manual and requires little more than hand tools; welding is required to join tubes that comprise the array skeleton (where appropriate – assembly via hardware connection remains the main form of rack assembly).

The installation and assembly procedure consists of mounting rack components to the support columns (piles), fastening the rack elements together, joining and welding tubes, mounting and assembling tracking motors and their associated hardware (where tracking systems are utilized), and finally, mounting and fastening the PV modules to the assembled rack.

2.1.8 Electrical Collector System

The electrical collector system will consist of underground wiring from the panel strings to the disconnect combiner boxes which are in turn connected to the pad-mounted inverters/transformers. Underground cabling will then run from the inverters/transformers to a 25-kV / 44-kV transformer (substation) which will upgrade the voltage to connect to the Hydro One distribution system. From the substation, the cabling will transfer to an aboveground pole-mounted line (1–2 poles, ~100 m max.) and connect to the Hydro One 44-kV distribution line (the M6 Feeder) east of County Road 14.

An underground “ground grid” cabling system will also be installed around the entire array structure to protect against electric faults as required by the Ontario Electrical Safety Authority.

2.1.9 Substation

The electrical substation for the solar farm will be located on the site property toward the northeast of the site. The substation equipment will include an isolation switch, a circuit breaker, a step-up power transformer (12.47 to 44 kV), switch gear, instrument transformers, grounding and metering equipment. It will be surrounded by a chainlink fence with a locked gate to meet Ontario Electrical Safety Authority requirements. The substation area will be gravelled with clean material imported to the site on an as-needed basis and sloped to facilitate drainage.

During the construction of the substation, the topsoil will be removed and approximately 600 mm of clean compacted crushed gravel will be imported on an as-needed basis. The pad will be constructed of poured concrete reinforced with rebar. The excavated topsoil will be re-used on site as feasible.

2.1.10 Clean-up and Reclamation

Waste and debris generated during the construction activities will be collected and disposed of at an approved facility. All reasonable efforts will be made to minimize waste generated and to recycle materials including returning packaging material to suppliers for reuse/recycling. During construction, industry best practices for spill prevention will be utilized. In the unlikely event of a minor spill, this will be cleaned up immediately and any impacted soils will be removed from site and disposed of at an approved and appropriate facility. At the conclusion of construction, vehicles and construction equipment will be removed from the site.

Stripped soil will be replaced and re-contoured in the construction areas and disturbed areas will be re-seeded, as appropriate. Erosion control equipment will be removed once inspections have determined that the threat of erosion has diminished to the original land-use level or lower.

High-voltage warning signs will be installed at the substation and elsewhere, as appropriate and as required by the ESA.

2.1.11 Facility Commissioning

The facility commissioning will occur once the Solar Panels and electrical system are fully installed and Hydro One is ready to accept grid interconnection. The commissioning activities will consist of testing and inspection of the electrical, mechanical and communications systems.

2.2 Operation Activities

2.2.1 General

The solar farm will require technical and administrative staff to maintain and operate the facility. Most of the farm’s operation will be controlled automatically or remotely, through a central monitoring hub. It is expected that a team of 1-2 full-time workers will be required to keep the facility operating properly and maintained regularly. Generally, a team of maintenance personnel covers a regional territory that houses multiple solar farms. The primary workers will be electricians, grounds keepers and mechanics, as well as software technicians who carry out maintenance on the equipment, along with a general supervisor.

Solar panels should operate during daytime hours, in both direct and diffuse light conditions (although at a lesser power output). Each 1-MW block (i.e., a series of array rows connected to two 500-kW inverters) has a comprehensive control system that monitors the panel and electrical subsystems, as well as the local insolation conditions to determine whether operations should be carried out. If an event occurs which is considered to be outside the normal operating range of the array, such as electrical trips, panel weight overload (e.g., snow, extremely high winds), the array will immediately take itself out of service and report the condition to the SCADA system. A communication line connects each 1-MW block to the monitoring hub, which closely monitors and, as required, controls the operation of the array.

2.2.2 Routine Farm Maintenance

Routine preventative maintenance activities are scheduled at six-month intervals with specific maintenance tasks scheduled for each interval. Maintenance is performed by removing the MW block from service and inspecting the electrical, control and mechanical systems on the array. Consumables are used, such as the various greases used to keep the mechanical components operating at peak performance. Following all maintenance work on the MW block, the area is cleaned. All surplus lubricants and grease-soaked rags are removed and disposed of in a prescribed manner. All maintenance activities will adhere to the same spill prevention industry best practices undertaken during the construction phase. Additional maintenance activities will include grass cutting, vegetation removal and fence repair.

2.2.3 Unplanned Farm Maintenance

Modern Solar Panels are very reliable and the major components are designed to operate for over 25 years. However, with large numbers of modules it is inevitable that component failures will occur despite the high reliability. Most commonly, the failure of small components such as switches, fans, or sensors will take a MW block, or even the entire farm out of service until the faulty component is replaced. These repairs can usually be carried out by a single technician visiting the farm for several hours.

2.2.4 Electrical System

The collector lines and substation will require periodic preventative maintenance activities. Routine maintenance will include condition assessment and protective relay maintenance of the substation as well as vegetation control.

2.2.5 Stray (or Tingle) Voltage

As the Perpetual Energy Lindsay Solar Farm project will be connecting to the distribution system, it will be designed not to increase the risk of stray voltage to area residents.

Stray voltage occurs when there is a voltage potential difference between grounded equipment and the customer neutral from the electrical distribution supply at a customer connection. When this Neutral to Earth Voltage (NEV) exists then there can be a voltage difference between ground at various locations on the customer's facilities due the currents flowing from the distribution system neutral to the ground. At a voltage difference above about 10 volts people may detect a tingle. Hydro One has standards for how they will deal with stray or tingle voltage complaints. Rarely are these a health hazard and many things can be done by the supply utility (Hydro One) and the customer to address the complaints. Livestock such as dairy cattle are sensitive to these small tingle voltages that are not a health hazard to humans. The local distribution company is responsible for addressing stray voltage concerns.

2.3 Decommissioning Activities

2.3.1 Procedures for Dismantling

If the facility is to be decommissioned and the solar array is to be removed at the end of its Feed-in-Tariff contract, the impacts will be similar to the construction phase, but in reverse sequence. The procedures will include:

The creation of temporary work areas in order to provide sufficient area for the lay-down of the disassembled panels and racking and loading onto trucks, an area must be cleared, levelled and made accessible. The topsoil will be removed and some material may need to be added.

Equipment will include, at a minimum:

- The use of cranes to remove the panels, racking, inverters and transformers; and
- The use of trucks for the removal of panels, racking, inverters and transformers.

Roads and culverts will be removed unless the landowner requests that they be left in place. Road bedding material will be removed and replaced with clean sub- and top-soil for reuse by the landowner for agricultural or other purposes. If requested by the landowner and subject to approval by the Kawartha Conservation Authority and the Ministry of Natural Resources, the culverts (if installed) will be removed and the land will be contoured to maintain the current drainage patterns; and decommissioning of electrical lines. Above ground lines and poles that are not shared with Hydro One will be removed and the hydro pole holes will be filled with clean fill.

2.3.2 Land Restoration Activities

Once the equipment has been removed the land will be restored to its previous use – in this case, an unused, fallow field. This will be accomplished by removing the foundations (or part of foundation), granular material from roadways and culverts (if installed), depending on the landowner preference. Land use will be restored using stockpiled subsoils and topsoil. If there is insufficient material onsite, topsoil and/or subsoil will be imported form a source acceptable to the landowner.

Although strict spill prevention procedures will be in place, there is the potential through the decommissioning process for small spills of solvents or fuels. The soil conditions of the site will be surveyed to the standards of the day to determine if any impacts have occurred. Should soil impacts be noted, the impacted soils will be delineated, excavated and removed, to the standards of the day, from the site for disposal at an approved and appropriate facility. The removed soils will be replaced with stockpiled sub- and topsoil, if available. If none are available, clean fill and topsoil will be imported.

2.3.3 Waste Disposal

As discussed above, the waste generated by the installation, operation and decommissioning of the solar farm is minimal and there are no toxic residues. Any wastes generated will be disposed of according to standards of the day with the emphasis of recycling materials whenever possible.

2.4 Emissions to the Environment

2.4.1 Air Emissions

No air emissions requiring approval will be generated from either the construction, operation or decommissioning phases. Some vehicular emission will be generated by heavy machinery during the construction and decommissioning phases however these will be minor in nature. There may also be some minor welding taking place on site which will result in some minor local air emissions. In order to minimize these air emissions the contractor will be required to minimize idling of equipment and, where feasible, welding will take place during the fabrication stage prior to arriving on site.

2.4.2 Liquid Waste

Only minimal amounts of liquid waste will be generated during the construction, operation and decommissioning phases. This liquid waste will be comprised mainly of sewage. As no staff will be onsite on a permanent basis and no operations building will be built this will be managed using portable toilet facilities which will have the waste generated disposed of offsite by a licensed contractor.

It is possible that small amounts of other liquid wastes such as grease, oil and/or paint may be generated during regular maintenance activities of equipment (tracking motors and electrical equipment). Should

any of these wastes be generated they will be removed promptly by a licensed contractor and disposed of at an approved and appropriate facility.

During decommissioning liquid waste will be limited to sewage and potentially transformer oil. The transformer oil will be non-hazardous (no PCBs) and will be drained and recycled offsite by a licensed third party contractor and an approved and appropriated facility.

2.4.3 Solid Waste

Solid waste will be generated during the construction, operation and decommissioning phases. During the construction this will primarily be packing material, scrap metal and wiring and domestic type waste generated by the construction staff. The waste will be separated into recyclables (metals, wood, paper and plastics) and non-recyclables and disposed of by a licensed third party contractor and an approved and appropriated facility.

During the operational phase of the project solid waste generation will be minimal and will be generated during maintenance activities. The waste will be similar to construction waste and will be composed of packing material, scrap metal, wiring and some domestic type waste. The waste will be separated into recyclables (metals, wood, paper and plastics) and non-recyclables and disposed of by a licensed third party contractor and an approved and appropriated facility.

Decommissioning activities will potentially generate greater amounts of waste at the end of the project life. Wherever possible project equipment including panels, inverters, transformers, racking and trackers will be sold or re-used on another site. Potential waste includes: panels, electrical equipment, scrap metal (from racking), wiring, fencing and gravel from the road construction. The waste generated during this phase will be separated into recyclable, non-recyclable and hazardous as per the regulations and industry best practices of the day. This would be disposed of by a licensed third party contractor and an approved and appropriated facility.

2.4.4 Hazardous Waste

It is not anticipated that any significant amounts of hazardous wastes will be generated and Perpetual Energy will attempt to procure non-hazardous alternatives whenever possible. Potential hazardous material will likely be limited to spent welding rods and used batteries. These items, if generated, will mainly be generated during the construction and decommissioning phases but some may be generated during the operational phase. No non-emergency vehicle maintenance will be permitted on the site and therefore no spent motor oil, anti-freeze or filters will be generated onsite. All hazardous wastes will be stored temporarily onsite in appropriate, clearly marked containers until the end of the construction or decommissioning phase and then disposed of by a licensed third party contractor and an approved and appropriated facility. Hazardous wasted generated during maintenance activities will be removed from the site at the conclusion of that particular activity and not be stored onsite.

2.4.5 Stormwater

The facility will be designed to maintain current drainage patterns and it is not anticipated that stormwater management facilities will be required. Vegetation will be allowed to grow under the solar panels to minimize the generation of runoff and sediment.

2.4.6 Water Taking Activities

There will be no permanent operations building onsite and no water taking will be required. Should water be required onsite during the construction, operations or decommissioning, it will be imported to the site.

2.4.7 Dust

It is anticipated that some dust will be generated during construction and decommissioning activities. As vegetation will be allowed to grow under the solar panels it is not expected that dust will be generated during operation. During construction and decommissioning dust will be mainly generated by vehicle traffic over gravel roads and/or cleared areas. To minimize this vehicle speeds will be limited and other

mitigation measures, such as wetting of roads and suspension of work during high winds, may be employed if deemed necessary.

3. Potential Environmental Effects

3.1 Heritage and Archaeological Resources

Construction of the proposed solar farm will result in solar panels covering large portions of the proposed study area. As such, construction has the potential to disturb archaeological resources, should they exist on the site. A preliminary desktop (Stage 1) Archaeological study is currently being conducted and has the following preliminary findings:

There are no recorded archaeological sites in the subject area; and

There are no protected properties or heritage resources in the vicinity of the site.

3.2 Natural Heritage and Water Features

3.2.1 Studies Completed

A desktop study was undertaken to determine potential areas of concern to be investigated during any future field surveys and to meet the requirements of the Ministry of Natural Resources under the Green Energy Act. This study was composed of a records review and will be followed up with field surveys at a later date. The records reviewed identified 2 streams on the western portion of the site, small wetlands in the north-western corner of the site and a woodlot in the extreme north-western corner of the site is considered candidate significant woodland.

A geographical search for significant or endangered species presence and associated habitat was conducted using the OMNR NHIC database. A conservative two (2) kilometre radius centroid search surrounding the subject lands was completed as it is understood that NHIC information is based on regional reports and habitat boundaries may be variable. The search revealed that records of Eastern Pipistrelle were known for the site and/or surrounding area.

3.3 Air, Odour, Dust

The project is a Class 3 solar project and will not emit any air or odour emissions beyond those described in section 2.4.1. Some dust is expected to be created during construction and decommissioning. Further discussion of the potential effects and mitigation measures is included in section 2.4.7.

3.4 Noise

Noise generated by the operation of the inverters and electrical substation has been cited as a potential concern by the MOE. Based on past experience operating solar farms, Perpetual Energy has found this noise to be negligible. In order to meet the MOE requirements a modeling study, conducted in accordance with Appendix A of the publication of the Ministry of the Environment entitled, "*Basic Comprehensive Certificates of Approval (Air) – User Guide*", dated April 2004 and subsequent amendments, will be completed.

3.5 Land Use and Resources

The construction, operation and decommissioning of the proposed solar farm is not expected to affect land use and resources. According to the Ontario Oil, Gas & Salt Resources library there are no oil or gas wells in near the study area. There are no identified aggregate resources in the vicinity of the site. There is a municipally identified closed landfill approximately 1.5 km to the west of the study area; however this is well outside of the identified area of influence of said landfill. The surrounding properties consist of "rural" designation and any forest in the vicinity is of poor quality.

3.6 Provincial and Local Infrastructure

The construction, operation and decommissioning of the proposed solar farm is not expected to significantly affect provincial or local infrastructure. Some increase in local traffic along Black Road will occur during construction and decommissioning activities. Consultations are underway with the local and regional municipalities to ensure that any disruptions and road impacts are minimal.

3.7 Public Health and Safety

The construction, operation and decommissioning of the proposed solar farm is not expected to significantly affect public health and safety. During construction and decommissioning the site will be surrounded by temporary fencing to prevent access to the public. The electrical equipment will be designed and installed in accordance with the Electrical Safety Authority standards and will be equipped with proper safety signage. The operational site and transformer substation will be surrounded by a fence to prevent public and large animal access.

3.8 Areas Protected under Provincial Plans and Policies

The project will not impact any lands under Provincial Plans and Policies. The site is not located in an area covered by: the *Greenbelt Act* or plan; The Oak Ridges Moraine Conservation Plan Area; The Niagara Escarpment Plan Area; or The Lake Simcoe Watershed Plan.

3.9 Summary of Potential Effects and Potential Mitigation Measures

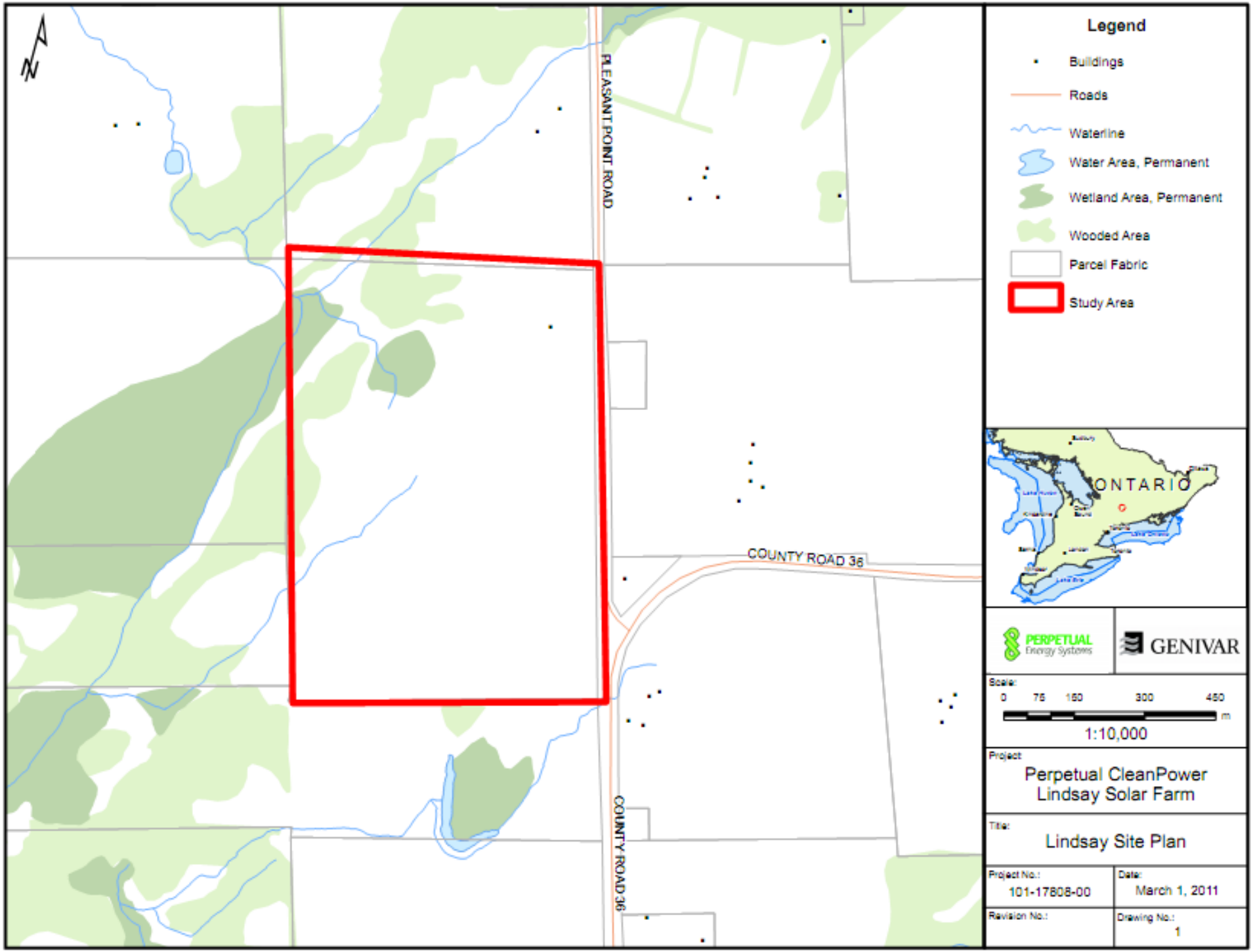
A preliminary summary of potential effects and potential mitigation measures are presented in Table 1.

Project Activity	Potential Effects	Mitigation Strategy	Residual Effects
Construction Activities			
Construction Activities	Disturbances to wildlife & birds due to construction activities	Adherence to woodlot and watercourse setbacks Minimal time required to complete activities	None Anticipated
	Clearing and grubbing and soil excavation	Site clearing and grubbing will be kept to a minimum area on-site by staking and marking off the areas that define limits of the work to be done Excavated soil will be re-used on-site where feasible, or disposed of in a proper facility off-site. Sedimentation and erosion controls	None Anticipated
	Impacts to surface water features from construction	Adherence to setbacks Complete permitting process with the KCA, if required Proper sizing and installation of culverts (if required) Stabilization of disturbed surfaces to prevent erosion Installation of light duty sedimentation fencing installed around work area during construction	None Anticipated
	A short-term increase in truck traffic during construction period.	Delivery of equipment will be coordinated with local traffic patterns	Minor traffic delays
	Archaeological resources	If any archaeological resources are noted, the project may be redesigned to avoid them If practical, the resources will be removed and catalogued in accordance with Ontario Ministry of Culture guidelines	None Anticipated
	Fuel or transformer oil spill	Any leak or spills from trucks or machinery would be contained and site would be properly cleaned up and disposed of at registered disposal facilities Transformers used in the project are silicone based and do not contain hydrocarbons Refuelling of all vehicles and equipment will be done away from watercourses during construction and no re-fuelling on-site during the operation phase	None Anticipated

Project Activity	Potential Effects	Mitigation Strategy	Residual Effects
	May experience annoyance with dust and/or noise	Dust suppression measures will be employed, as necessary On-site supervisor to address any noise complaints	Minor short-term annoyances
Operational Activities			
Solar Farm Operation	Reduction in aesthetic quality of landscape	Complaints tracking Adherence to noise setbacks will site inverters away from residents	None Anticipated
	Noise impacts on receptors (residents located on non-lease properties)	Adherence to noise setbacks Noise modelling to predict sound levels Repair equipment in a timely manner Complaints tracking	None Anticipated
	Spill of transformer oil	Proper disposal of waste materials	None Anticipated
Decommissioning Activities			
Removal of Equipment	Surficial disturbance	Re-grading of site & land use restored after equipment disturbances complete Install erosion control measures	None Anticipated
Removal Equipment	Sensory disturbance (sound and visual presence)	Complaints tracking Impacts from equipment usage & personnel present will be short term	Minor short-term annoyance
	Dust	Watering of exposed soils Maximum speeds	Minor short-term annoyance
	Surficial disturbance	Re-grading of site & land use restored after equipment disturbances complete Install erosion control measures	None Anticipated
Removal of Transformer	Spill of transformer oil	An oil containment system will be maintained during decommissioning to prevent soil contamination in the event of a leak Proper disposal of waste materials	None Anticipated

Project Activity	Potential Effects	Mitigation Strategy	Residual Effects
Accidents and Malfunctions			
Accidents & Malfunctions	Land contamination from lubricant/transformer fluid leak or spill	Any leak or spills from trucks or machinery would be contained and site would be properly cleaned up and disposed of at registered disposal facilities Transformers used in the project are silicone based and do not contain hydrocarbons Refuelling of all vehicles and equipment will be done away from watercourses during construction and no re-fuelling on-site during operation phase	None Anticipated
	Public safety	Proper signage warning of electrical danger Siting on private property which restricts public access to the site Fencing of the project area for security based on standard utility practices	None Anticipated

Appendix A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COUNTY ROAD 36
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Parcel Fabric
Study Area
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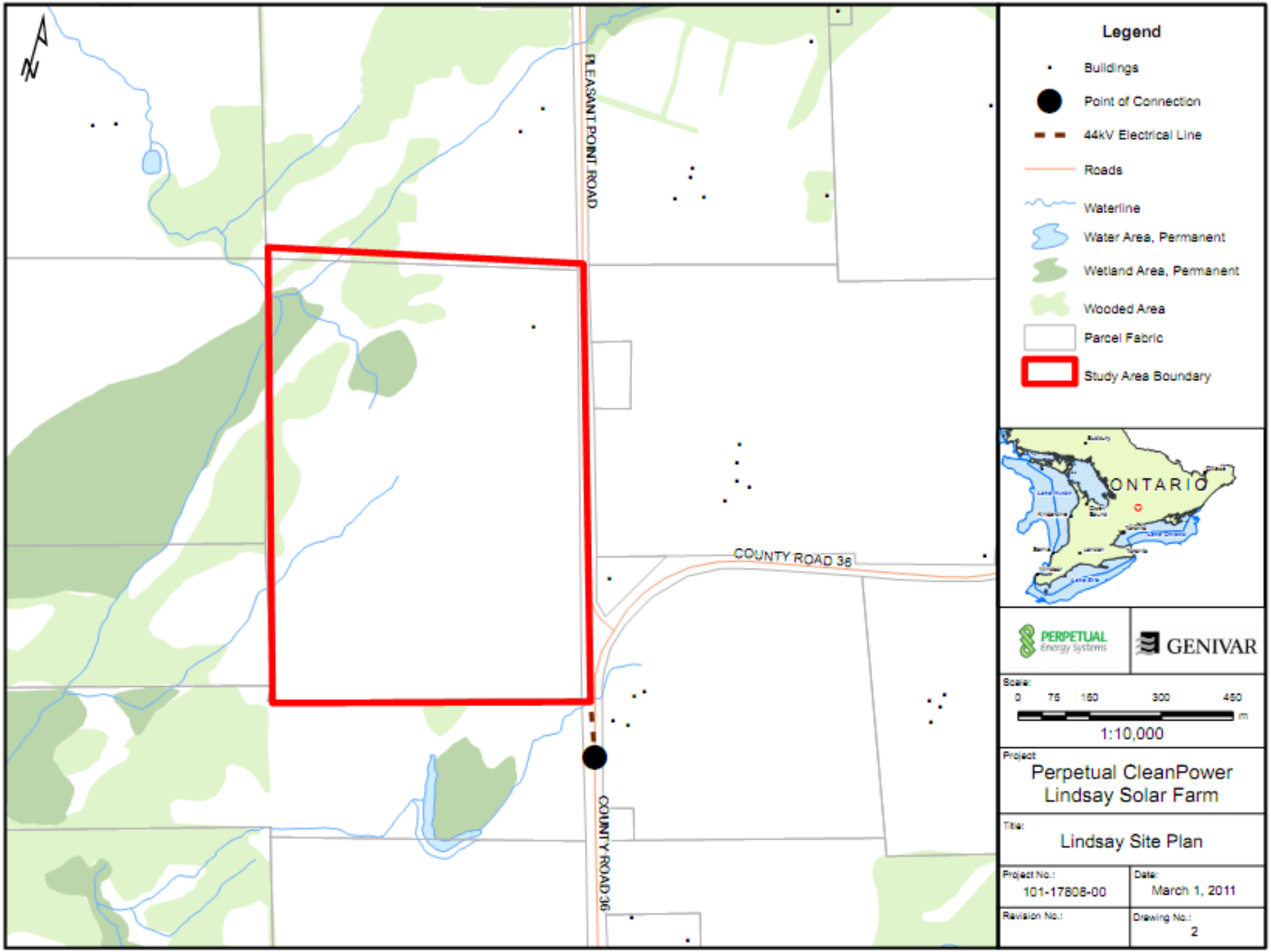
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PERPETUAL Energy Systems
GENIVAR
Scale:
0 75 150 300 450
m
1:10,000
Project:
Perpetual CleanPower Lindsay Solar Farm
Title:
Lindsay Site Plan
Project No.:
101-17606-00
Date:
March 1, 2011
Revision No.:
Drawing No.:
2