



**K2 WIND POWER PROJECT
DECOMMISSIONING PLAN REPORT**

**Prepared by:
K2 Wind Ontario Limited Partnership
Suite 105, 100 Simcoe Street
Toronto, ON
M5H 3G2**

**In association with:
Stantec Consulting Ltd.;
SENES Consultants Limited; and
AMEC Environment & Infrastructure**

November 2012

TABLE OF CONTENTS

| | PAGE |
|---|-------------|
| 1.0 INTRODUCTION..... | 1 |
| 1.1 Project Overview | 1 |
| 1.2 Report Requirements..... | 1 |
| 2.0 PROBABLE FUTURE USE OF THE PROJECT LOCATION..... | 3 |
| 3.0 DECOMMISSIONING ACTIVITIES | 4 |
| 3.1 General Environmental Protection | 4 |
| 3.2 Pre-Dismantling Activities | 4 |
| 3.3 Equipment Dismantling and Removal..... | 4 |
| 3.3.1 Wind Turbine Generators..... | 4 |
| 3.3.2 Electrical Infrastructure | 5 |
| 3.3.3 Access Roads | 6 |
| 3.3.4 Water Crossings..... | 6 |
| 3.3.5 Operation and Maintenance Building..... | 6 |
| 3.3.6 Met Towers | 7 |
| 3.4 Site Restoration Plan | 7 |
| 3.4.1 Agricultural Lands | 7 |
| 3.4.2 Areas not in Agricultural Production..... | 8 |
| 3.4.3 Municipal Road Allowances | 8 |
| 3.4.4 Watercourse Crossings..... | 8 |
| 3.4.5 Potential Contamination..... | 9 |
| 4.0 DECOMMISSIONING DURING CONSTRUCTION (ABANDONMENT OF PROJECT) | 10 |
| 5.0 MANAGING EXCESS MATERIALS & WASTE..... | 11 |
| 6.0 MONITORING..... | 12 |
| 7.0 OTHER CONSIDERATIONS..... | 13 |
| 7.1 Emergency Response and Communications Plan | 13 |
| 7.2 Decommissioning Notification..... | 13 |
| 7.3 Other Approvals | 13 |
| 8.0 CLOSURE..... | 14 |
| 9.0 REFERENCES..... | 15 |

LIST OF TABLES

| | |
|---|----|
| Table 1-1: Decommissioning Plan Report Requirements per Ontario Regulation 359/09 | 2 |
| Table 5-1: Typical Facility Decommissioning Waste Materials and Modes of Disposal | 11 |
| Table 7-1: Potential Decommissioning Permits and Approvals | 13 |

1.0 INTRODUCTION

1.1 Project Overview

K2 Wind Ontario Inc., in its capacity as general partner of K2 Wind Ontario Limited Partnership (the Proponent), is proposing to develop, construct and operate the K2 Wind Power Project (the Project or K2 Wind) in the Township of Ashfield-Colborne-Wawanosh (Township of ACW) north of Goderich within the County of Huron, Ontario. The Proponent is a limited partnership formed under the *Limited Partnerships Act* (Ontario), with K2 Wind Ontario Inc. as general partner and CP K2 Holdings Inc. (an affiliate of Capital Power Corporation), Samsung Renewable Energy Inc., and Pattern K2 LP Holdings LP (an affiliate of Pattern Renewable Holdings Canada ULC), as limited partners. The Project would supply approximately 270 megawatts (MW) of electricity to the Ontario power grid. The development of the Project would help the province of Ontario meet its goal of increasing the proportion of electricity generated from renewable sources. The Project is subject to Ontario Regulation 359/09 – Renewable Energy Approvals under Part V.0.1 of the *Environmental Protection Act* (O. Reg. 359/09).

Key Project components would consist of up to 140 wind turbines, electrical collection and communications systems including a transmission line, a transformer station, a substation, an operation and maintenance building, meteorological towers (met towers), access roads, and temporary construction and laydown areas.

The Proponent has elected to assess and seek approval for some alternative Project configurations. The Renewable Energy Approval (REA) application process will consider two potential transmission line voltages (138 kV vs. 230 kV), two potential transmission line routes, and several alternate access road and collector line alignments. Final selection of the sites to be used would be based on the results of consultation activities, detailed design / engineering work, and the conditions experienced during construction.

The Proponent retained Stantec Consulting Ltd., SENES Consultants Limited, and AMEC Environment & Infrastructure, a division of AMEC Americas Limited (AMEC) to assist in the preparation of the REA application with input from Timmins Martelle Heritage Consultants Inc., Selde Corporation and Zephyr North Canada.

1.2 Report Requirements

The purpose of the *Decommissioning Plan Report* is to provide the public, Aboriginal communities, municipalities, and regulatory agencies with an understanding of the closure plan for the Project at the end of its useful life, and to describe how the Proponent proposes to restore the Project Location to an acceptable condition for its intended use.

The *Decommissioning Plan Report* has been prepared in accordance with Item 3, Table 1 of O.Reg. 359/09 and in consideration of the Ministry of the Environment's (MOE's) guidance document *Technical Guide to Renewable Energy Approvals*.

The following table provides the requirements of the *Decommissioning Plan Report* as prescribed in the Regulation and the relevant sections where it can be found within this document.

Table 1-1: Decommissioning Plan Report Requirements per Ontario Regulation 359/09

| ID | Requirements | Section Number |
|--|--|----------------|
| Set out a description of plans for the decommissioning of the renewable energy generation facility, including the following: | | |
| 1. | Procedures for dismantling or demolishing the facility. | 3.3 |
| 2. | Activities related to the restoration of any land and water negatively affected by the facility. | 3.4 |
| 3. | Procedures for managing excess waste and materials. | 5.0 |

2.0 PROBABLE FUTURE USE OF THE PROJECT LOCATION

The wind turbines used for the Project are expected to be in service for the term of the 20 year Ontario Power Authority Power Purchase Agreement contract. Following the term of the contract, a decision would be made regarding whether to extend the life of the facility or to decommission. Decommissioning would entail the removal of facility components and restoring the land to a suitable condition for the land's likely future use. The current land use of the Project Location is described in the following sections, with a determination of probable future use at the time of decommissioning.

Turbine Areas

The current land use for all proposed turbine sites, including the associated access roads and collector system is entirely agricultural. It is anticipated that these areas would be restored to agricultural use.

Met Tower Areas

The current land use of the proposed met tower locations including access and underground cabling route is entirely agricultural. It is anticipated that these areas would be restored to agricultural use.

Transformer Station Property

The current land use of the transformer station property is entirely agricultural. It is anticipated that this area would be restored to agricultural use.

Substation Property

The current land use of the substation property, where the operation and maintenance building would also be located, is entirely agricultural. It is anticipated that this area would be restored to agricultural use.

Municipal Road Allowance

The municipal road allowance, which is proposed for use for electrical system components including the installation of underground cables, above ground cables where required and underground transmission line are cleared. Future use of the municipal road allowance is anticipated to remain the same.

Collector System and Transmission Line on Private Property

Portions of the collector system and the transmission line would be located on participating private land. These areas are currently agricultural or landscaped, and it is anticipated that these areas would be restored to their original use.

3.0 DECOMMISSIONING ACTIVITIES

3.1 General Environmental Protection

During decommissioning and restoration activities, general environmental protection and mitigation measures would be implemented. Many activities during decommissioning would be comparable to the construction phase of the Project such as movement of workers and materials, the use of heavy equipment on site, and soil moving activities. General mitigation measures and best management practices, as appropriate, including erosion and sediment control, air quality and noise mitigation, as well as contingency plans for unexpected finds and spills, are provided in the *Construction Plan Report*.

3.2 Pre-Dismantling Activities

Prior to engaging in decommissioning works, the Proponent will develop a decommissioning plan in accordance with MOE requirements at the time of decommissioning. Decommissioning and restoration activities will be performed in accordance with all relevant statutes in place at the time of decommissioning. The remainder of this report addresses general decommissioning activities as they are envisioned at this time.

At the end of the Project's useful life, it will first be de-energized and isolated from all external electrical lines.

Prior to any dismantling or removal of equipment, staging areas would be delineated at each turbine site and at the substation and transformer station properties. Decommissioning activities would be conducted within these designated areas; this includes ensuring that vehicles and personnel stay within the demarcated areas. Work to decommission the transmission line and collector lines would be conducted within the boundaries of the municipal road allowance and appropriate private lands.

Construction pads or mats, to accommodate dismantling, would be installed at each turbine location in the same manner as described in the *Construction Plan Report*.

Temporary erosion and sediment control measures will be implemented as noted in Section 3.1. These measures will be implemented with consideration of industry best management practices, and will be determined by an environmental advisor prior to decommissioning.

3.3 Equipment Dismantling and Removal

3.3.1 Wind Turbine Generators

Turbine Foundations

The turbine foundations would be partially removed to a depth of approximately 1 m below grade, in accordance with the land agreements. This depth enables normal agricultural practices to be conducted over the foundation areas. The concrete would be removed from the site by dump truck. It is not anticipated that blasting would be used to remove the turbine

foundations, however if required for turbine foundation removal, blasting may be considered and appropriate consultation would occur with required authorities.

Turbines

The turbines would be dismantled into their original component parts. A heavy-lift crawler and mobile cranes would be used to carry out the reverse sequence of steps that occurred during turbine assembly (detailed in the *Construction Plan Report*), namely:

- Removal of the blades and hub;
- Removal of the nacelle; and
- Decoupling and lowering the tower sections.

The turbine components would be temporarily stored at the staging area at each turbine site until removed from the site by truck.

To the extent possible, crane paths for the decommissioning phase would follow the same routes used for the construction phase.

Staging Areas

A temporary staging area at each turbine location would be used for temporary storage of the turbine components, parking, and excavated foundation spoil pile. This area would generally not be excavated or gravelled with the exception of the construction pads, and would be restored to pre-existing conditions at the end of the decommissioning phase.

Construction Pads or Mats

All construction pads or mats would be constructed for disassembly of the turbines in the same manner as described in the *Construction Plan Report*. After turbine removal is completed, construction pads would be removed; this includes the geotextile material beneath the pads and granular material. Granular and geotextile materials would be removed from the site by dump truck. Alternatively, if appropriate, temporary crane mats made of timber would be removed and the area would be de-compacted.

3.3.2 Electrical Infrastructure

Electrical Collector Lines and Transmission Line

Underground collector lines and the transmission line on participating properties would remain in place, with both ends that come to the surface excavated and removed to approximately 1 m below grade, in consultation with the landowner and in accordance with the land agreements. Any junction boxes/disconnecting switch boxes will be removed. Underground collector lines, the transmission line, buried splice infrastructure, junction boxes, and disconnecting switch boxes installed in the road allowances would be removed, if required by the agreements with the Township of ACW and/or the County.

Any above ground collector lines and poles in the municipal road allowance would be removed if necessary. In areas where above ground collector lines are strung on shared use poles, only the lines would be removed, unless otherwise required by the shared use agreement that would be developed with other users.

Padmount Transformers

Padmount transformers, located immediately adjacent to each turbine, and grounding grids would be removed, and the associated concrete foundation would be removed to approximately 1 m below grade. All electrical system components would be taken off-site by truck.

Substation and Transformer Station

The substation and transformer station would be dismantled. The transformers, switchgear, and grounding grids would be removed, and the concrete foundations would be removed to approximately 1 m below grade. This may include removal of the transformer pit and sump pump, and the drainage system. All granular and geotextile materials would be removed from the site by dump truck. All electrical system components would be taken off-site by truck.

The switching station adjacent to the substation and the interconnection to the Hydro One 500 kV transmission lines will be owned and operated by Hydro One. The continued operation or decommissioning of these facilities will depend on Hydro One's requirements. Any eventual decommissioning will be conducted by Hydro One in accordance with its procedures.

3.3.3 Access Roads

Access roads would be removed; this includes the geotextile material beneath the roads and granular material. Granular and geotextile materials would be removed from the site by dump truck. Where landowners see it advantageous to retain access roads, these would be left in place.

3.3.4 Water Crossings

Culverts would be removed if requested by the landowner and approved by the Township, County, the Ministry of Natural Resources (MNR), the Maitland Valley Conservation Authority (MVCA) and/or Fisheries and Oceans Canada (DFO), as appropriate.

3.3.5 Operation and Maintenance Building

The operation and maintenance building would be demolished, if appropriate, and all building materials removed from the site. The building's concrete foundation would be removed to a depth of approximately 1 m below grade. In the event that a future use is identified for the operation and maintenance building, it may be maintained on site.

Septic System

The septic system would be decommissioned in accordance with local and/or provincial requirements at the time (e.g., *Environmental Protection Act*), as appropriate. This may include pumping out, filling with sand, and capping of the tank and tile bed.

Water Well

The water well would be decommissioned in accordance with local and/or provincial requirements at the time, as appropriate. This may include capping the well below grade and removal of pump.

Stormwater Management Pond

The stormwater management pond would be decommissioned in accordance with local and/or provincial requirements at the time, as appropriate. The pond areas would be backfilled using clean fill and imported topsoil and reseeded as required in consultation with the landowner.

3.3.6 Met Towers

The met towers would be disassembled and removed by truck from the site. The truck to be used for removal of the met tower would be determined based on the tower model selected, but may be an appropriately sized pick-up truck (e.g. F-350) or a small rig. Foundations would be partially removed to a depth of approximately 1 m below grade. The site would be accessed using the same route as in the construction phase.

Power and data cabling would remain in place, with both ends that come to the surface excavated, cut, and removed to approximately 1 m below grade. The excavation would be backfilled in consultation with the landowner and in accordance with the land agreement.

3.4 Site Restoration Plan

This section describes how the lands used for the facility components will be restored to bring the site into a condition consistent with the probable future use described in Section 2.0.

At the time of decommissioning, this Site Restoration Plan should be updated as necessary based on the standards and best practices at the time of decommissioning, and in consultation with landowners and the appropriate regulatory and government bodies.

3.4.1 Agricultural Lands

Areas that would require excavations during decommissioning of the facility are described in Section 3.3. Subsoil or clean fill would be added as necessary.

Areas that may have become compacted due to facility operation or decommissioning activities, including construction pads and access roads, would be de-compacted using chisel ploughing and/or sub-soiling, as determined by an environmental advisor.

Any agricultural tile drains damaged during decommissioning would be repaired by a drainage tile contractor. After repair of the agricultural tile drains the landowner would be invited to inspect the repair.

Topsoil would be added to similar depth as surrounding areas, where necessary. Imported topsoil added to agricultural areas would be of the same or similar soil type and texture as pre-construction conditions and/or adjacent lands and would be selected with input from the landowner.

Areas would be graded to pre-construction conditions and restored appropriately, in consultation with the landowner.

3.4.2 Areas not in Agricultural Production

In the event that any of the optioned properties where the facility components are sited are no longer under agricultural production, slightly different methods would be used.

The subsoil would be restored and de-compacted, and topsoil added, as described in Section 3.4.1. The areas would be re-seeded or re-vegetated with the same or similar vegetation as adjacent areas to prevent topsoil erosion.

If seed is applied, any erosion and sediment control measures required on-site would be left in place until seed is fully established, as determined by an environmental advisor.

3.4.3 Municipal Road Allowances

Where Project infrastructure has been removed, roadside ditches would be seeded with quick growing native species to prevent topsoil erosion; the seed mixture would be determined at that time in consultation with the Township of ACW, the County and/or the MVCA. Erosion and sediment control measures at the ditch would be left in place until seed is fully established, as determined by an environmental advisor.

If any underground collector lines require removal by request of the Township of ACW or the County, the area would be rehabilitated to pre-existing conditions as appropriate in consultation with the Township of ACW/County.

3.4.4 Watercourse Crossings

Any proposed decommissioning works within or near watercourses would be discussed with the Township of ACW, the County, the MNR, the MVCA and/or DFO, as necessary, to determine any applicable guidelines, permitting, site-specific mitigation and/or remediation plans. It is envisioned that similar mitigation and monitoring measures implemented during construction would be used for the decommissioning of the Project. These are described in the *Construction Plan Report*, and site specific requirements determined during the detailed design and permitting process. Measures are anticipated to include standard best management practices including erosion and sediment control during removal of the structures.

3.4.5 Potential Contamination

During the construction and operation of the Project, environmental management practices would be in effect, such as secure containment of potential hazardous materials to minimize the potential for spills. As there is limited handling or storage of bulk fuels or chemicals during the construction or operations phases of the Project, the potential for site contamination is very low. The Project should not, therefore, result in any long term decommissioning issues that would be detrimental to future site uses. The turbine sites would have no materials storage. Liquids such as oils would be primarily contained within equipment. The potential for spills at each turbine site during the life of the Project is limited. In the event that a spill occurred at a turbine location a spills management protocol would be enacted such that appropriate clean up and mitigation was put in place.

The operation and maintenance building would contain materials storage for the overall facility, and the substation and transformer station would contain oils and other materials. As part of the decommissioning of this site, an Environmental Site Assessment would be completed to evaluate any potential impacts identified from a review of site operational and historical records, as required. The Environmental Site Assessment, if required, would follow the protocols of O.Reg. 153/04 – Records of Site Condition, Part XV.1 of the *Environmental Protection Act* (O.Reg. 153/04) as amended or other applicable regulation(s) in place at the time of the decommissioning of the Project. Rehabilitation measures for any contaminated soil or groundwater would be determined at the time of decommissioning, and would follow regulations and best practices in place at the time of decommissioning.

4.0 DECOMMISSIONING DURING CONSTRUCTION (ABANDONMENT OF PROJECT)

In the event that the Proponent cannot successfully complete the construction of the Project, the rights to the Project (and any associated liabilities and obligations) may be sold to allow the Project to be constructed by the purchasing developer.

In the event that a delay occurs in the purchasing of the Project by another developer, the Proponent would be responsible for interim environmental protection. In the event that the site has been cleared and/or excavated in preparation for installation of Project infrastructure, appropriate environmental protection measures would be implemented to prevent environmental effects such as topsoil erosion and/or watercourse sedimentation. The extent of environmental protection measures required would be dependent on the progress made at the time of Project abandonment, and would be determined through site inspections by qualified specialists. Possible measures would include, as appropriate, erosion and sediment control fencing, filling excavated areas, replacement of topsoil and/or reseeded and re-vegetation.

In the event that the Project is not purchased by another developer, the Proponent would be responsible for decommissioning of the Project. In such a case, the decommissioning process to be followed and the mitigation measures to be implemented would be the same as those detailed in Section 3.0 for decommissioning of the facility after ceasing operation of the Project.

5.0 MANAGING EXCESS MATERIALS & WASTE

During dismantling and demolition of the Project, the Proponent will follow the principles outlined in *A Guide to Waste Audits and Waste Reduction Work Plans For Construction & Demolition Projects, as required under Ontario Regulation 102/94 (O.Reg. 102/94)*, as amended or other applicable regulation(s) in place at the time. These principles follow the 3Rs hierarchy and include the reduction of the amount of waste generated, reuse of materials, and recycling of any materials that cannot be reused. All wastes would be managed in accordance with *Ontario Regulation 347, General – Waste Management (O.Reg. 347)* and with reference to *Ontario Provincial Standard Specification 180 - General Specification For The Management of Excess Materials (OPSS. 180)*, or relevant regulations and specifications in effect at that time.

Typical waste materials and modes of disposal, recycling or reuse are presented in Table 5-1 below:

Table 5-1: Typical Facility Decommissioning Waste Materials and Modes of Disposal

| Component | Mode of Disposal |
|---|--|
| Turbine blades | Cut and dispose in landfill |
| Turbine towers | Recycle |
| Met towers | Recycle |
| Generators and gearboxes | Salvage for reuse or recycle |
| Concrete foundations | Crush and recycle as granular material |
| Cabling | Recycle |
| Transformers and switchgear | Salvage for reuse or recycle |
| Granular materials (roads, tower sites, etc.) | Reuse or dispose in landfill |
| Oils/lubricants | Recycle |
| Hazardous materials | Dispose through licensed hauler |
| Geotextile material | Dispose in landfill |
| Miscellaneous non-recyclable materials | Dispose in landfill |

Major pieces of equipment may be recyclable or reusable. The steel towers may be recycled. Electrical equipment could either be salvaged for reuse or recycled. Components such as the generators and cabling are likely to have a high resale value due to copper and aluminum content. Concrete from footings could be crushed and recycled as granular fill material. Spent oils could be recovered for recycling through existing oil reprocessing companies.

As much of the facility would consist of reusable or recyclable materials, there would be minimal residual waste for disposal as a result of decommissioning the facility. Small amounts of registerable waste materials would be managed in accordance with O.Reg. 347 or subsequent applicable legislation. Residual non-hazardous wastes would be disposed at a licensed landfill in operation at the time of decommissioning.

6.0 MONITORING

For agricultural land, potential soil problem areas including trench subsidence, soil erosion and/or stoniness would be noted. For municipal road allowances, a review should occur of the establishment and health of re-vegetation as required, depending on pre-construction conditions. Additional monitoring activities may also be conducted, depending upon the site conditions at the time of decommissioning. If negative impacts are noted during monitoring activities, appropriate remediation measures would be implemented as necessary, and additional follow-up monitoring would be conducted, as appropriate and determined in consultation with required authorities.

7.0 OTHER CONSIDERATIONS

7.1 Emergency Response and Communications Plan

The Project's Emergency Response and Communications Plan is discussed in the *Design and Operations Report*. The plan would be in effect for all phases of the Project including decommissioning.

7.2 Decommissioning Notification

Prior to decommissioning, the Proponent would consult with interested parties regarding the details of decommissioning and would prepare an updated and comprehensive decommissioning plan as required to meet regulatory requirements in effect at that time. A description of non-emergency communications with Project stakeholders is included in the Emergency Response and Communications Plan.

7.3 Other Approvals

Following the preparation of the updated and comprehensive decommissioning plan as required, the Proponent would obtain all necessary approvals in effect at the time from appropriate government and regulatory bodies. Currently existing permits and approvals, which may be required at the time of decommissioning, are provided in the following table (Table 7-1).

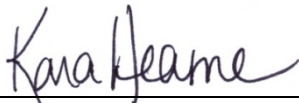
Table 7-1: Potential Decommissioning Permits and Approvals

| Permit / Approval | Administering Agency | Rationale |
|--|----------------------------------|--|
| Municipal | | |
| Building Permit | Township | Compliance with building codes (demolition) |
| Occupancy Permit | Township /County | Use of Township roads |
| Road Cut Permit | Township/County | May be required for works to Township roads |
| Transportation Plan | Township/County | Adherence to road safety and suitability |
| Work within the road allowance | Township/County | Required for works in road allowances |
| Provincial | | |
| Development, Interference with Wetlands, and Alterations to Shorelines and Watercourses Permit | MVCA | Work within floodplains, water crossings, river or stream valleys, hazardous lands and within or adjacent to wetlands. Projects requiring review, Fisheries Act authorization and/or assessment under the Canadian Environmental Assessment Act are forwarded to the DFO |
| Record of Site Condition | MOE | For change of property use and/or ownership |
| Notice of Project | Ministry of Labour | Notify the Ministry of Labour before decommissioning begins |
| Special Vehicle Configuration Permit | Ministry of Transportation (MTO) | Use of non-standard vehicles to transport large components |
| Transportation Plan | MTO | Adherence to road safety and suitability |
| Highway Entrance Permit | MTO | Interference or obstruction of the highway |
| Change of Access and Heavy/Oversize Load Transportation Permit | MTO | Compliance with provincial highway traffic and road safety regulations |
| Wide or Excess Load Permit | MTO | Transportation of large or heavy items on provincial highways |

8.0 CLOSURE

K2 Wind Ontario Limited Partnership, in association with Stantec Consulting Ltd., SENES Consultants Limited, and AMEC Environment and Infrastructure, has completed this report for the exclusive use of the Proponent for specific application to the Project. The work has been completed in accordance with Ontario Regulation 359/09, and in consideration of the guidance document *Technical Guide to Renewable Energy Approvals*.

Prepared by:



Kara Hearne

Project Manager
Stantec Consulting Ltd.



Sarah Palmer

Senior Environmental Advisor
Capital Power Corporation
for K2 Wind Ontario Limited Partnership.

9.0 REFERENCES

Ontario Regulation 347. General – Waste Management.

Ontario Ministry of the Environment. 1994. Ontario Regulation 102/94. A Guide to Waste Audits and Waste Reduction Work Plans For Construction & Demolition Projects, as required under Ontario Regulation 102/94.

Ontario Ministry of Environment. 2004. Ontario Regulation 153 - Records of Site Condition, Part XV.1 of the Environmental Protection Act.

Ontario Provincial Standard Specification (OPSS) 180. 2005. General Specification For The Management of Excess Materials. November 2011.

Ontario Regulation 359/09. Renewable Energy Approvals Under Part V.0.1 of the Act made under the Environmental Protection Act.

Ontario Ministry of the Environment. 2011 & 2012. Technical Guide to Renewable Energy Approvals. Queen's Printer for Ontario. PIBS 8472e.