THE ENERGY BOUTIQUE

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January 7, 2016

Ms. Kirsten Walli, Board Secretary
Ontario Energy Board
2300 Yonge Street
27th Floor
Toronto, Ontario
M4P 1E4

Dear Ms. Walli:

Re: SP Belle River Wind LP - Application for Leave to Construct Transmission Facilities

We are counsel to SP Belle River Wind LP (the "Applicant"). On behalf of the Applicant, we are hereby electronically filing an application, pursuant to section 92 of the *Ontario Energy Board Act*, for leave to construct electricity transmission facilities within the Town of Lakeshore in the County of Essex, Ontario, for the purpose of connecting the Applicant's renewable energy generation facility to the IESO-controlled grid (the "Application"). Two hard copies of the Application will be couriered to the Board today.

The Applicant will be filing a Notice of Proposal pursuant to section 81 of the *Ontario Energy Board Act* under separate cover.

Sincerely,

Andrew Taylor

ONTARIO ENERGY BOARD

IN THE MATTER OF the *Ontario Energy Board Act, 1998,* S.O. 1998, c.15 (Sched. B);

AND IN THE MATTER OF an application by SP Belle River Wind LP for an Order or Orders pursuant to section 92 of the *Ontario Energy Board Act, 1998* (as amended) granting leave to construct transmission facilities in the County of Essex, Ontario.

APPLICATION FOR LEAVE TO CONSTRUCT

SP BELLE RIVER WIND LP

January 7, 2016

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ONTARIO ENERGY BOARD

IN THE MATTER OF the *Ontario Energy Board Act, 1998*, S.O. 1998, c.15 (Sched. B);

AND IN THE MATTER OF an application by SP Belle River Wind LP for an Order or Orders pursuant to section 92 of the *Ontario Energy Board Act, 1998* (as amended) granting leave to construct transmission facilities in the County of Essex, Ontario.

APPLICATION

1. This Application is made by SP Belle River Wind LP ("**Belle River Wind**" or the "**Applicant**"), by its general partner SP Belle River Wind GP Inc. The Applicant is a limited partnership formed pursuant to the laws of Ontario.

2. The Applicant's limited partners are indirectly owned by affiliates of Pattern Renewable Holdings Canada ULC ("**Pattern**") and Samsung Renewable Energy Inc. ("**Samsung**"), each of whom indirectly holds a 49.99% interest in the Applicant. The Applicant's general partner holds 0.02% interest in the Applicant, and is indirectly owned by Samsung and Pattern. A description of the Applicant and its partners, as well as an organizational chart, is at Exhibit B, Tab 2, Schedule 1, Section (i).

3. The Applicant hereby applies to the Ontario Energy Board (the "**Board**") pursuant to section 92 of the *Ontario Energy Board Act, 1998* (the "**Act**") for an order or orders granting leave to construct the following facilities, all within the Town of Lakeshore in the County of Essex, to connect up to a 100 MW wind generation facility known as the Belle River Wind project (the "**Wind Farm**") to the Hydro One Networks Inc. ("**Hydro One**") transmission system:

i. on the generation side, a 230 kV/34.5 kV substation (the "**Joe Byrne Substation**");
ii. an approximately 7km 230kV overhead transmission line (the "**Transmission Line**") that will run from the Joe Byrne Substation to a switching station described in (iii) below;
iii. a 230 kV switching station (the "**Brody Switching Station**") at the connection point on Hydro One's transmission system.

4. The facilities described in paragraph 3 are collectively referred to herein as the "**Transmission Project**".

5. The Government of Ontario entered into a Green Energy Investment Agreement (the "**Agreement**") on January 21, 2010 with Samsung C&T Corporation (which wholly-owns Samsung, and is referred to herein as, the "**Samsung Parent**") and Korea Electric Power Corporation ("**KEPCO**"). The Agreement was subsequently amended on July 29, 2011 and June 20, 2013, and a copy of the fully amended and restated version of the Agreement (dated as of June 20, 2013) is attached hereto at Exhibit B, Tab 3, Schedule 3, Appendix 'C'.

6. Through its indirect ownership interest in the Applicant, Samsung along with its development partner Pattern will develop the Wind Farm of up to 100 MW located within the Town of Lakeshore. The Applicant entered into a 20-year Power Purchase Agreement with the Ontario Power Authority (the "**OPA**"), now the Independent Electricity System Operator (the "**IESO**") on September 22, 2014.

7. The Wind Farm will further the Ontario Government's policy objective to increase the amount of renewable energy generation being added to the Province's energy supply mix. In particular, the Wind Farm will contribute up to 100 MW of clean, renewable energy to the provincial electricity grid.

8. The impetus of this Application is to obtain leave to construct the Transmission Project to connect the Wind Farm to the IESO controlled grid.

9. The Applicant plans to locate the Transmission Line along road allowances pursuant to Road Use Agreements with the Town of Lakeshore and the County of Essex. Both the Joe Byrne Substation and the Brody Switching Station will be located on private property. A map of the Transmission Project route is at Exhibit C, Tab 2, Schedule 1(ii).

10. The Applicant is in the process of securing the necessary land rights for the Transmission Project, including Road Use Agreements with the Town of Lakeshore and the County of Essex. The form of land use agreements offered by the Applicant to private landowners is at Exhibit E, Tab 1, Schedule 2.

11. The IESO completed a final System Impact Assessment Report ("**SIA**") for the Wind Farm and Transmission Project dated December 11, 2015. The IESO concluded that "the proposed connection will not result in material adverse impact on the reliability of the integrated power system". The Applicant also received a *Notification of Conditional Approval of Connection Proposal* (the "**Notification**") from the IESO on December 11, 2015. The SIA is at Exhibit F, Tab 1, Schedule 3 and the Notification is at Exhibit F, Tab 1, Schedule 2.

12. Hydro One completed a final Customer Impact Assessment Report ("**CIA**") for the Wind Farm and Transmission Project dated December 11, 2015. The CIA is at Exhibit G, Tab 1, Schedule 2.

13. The Applicant is subject to the requirements of the Renewable Energy Approval ("**REA**") process under Ontario Regulation 359/09 under the *Environmental Protection Act*. The final REA submission package for the Generation Project was submitted to the Ministry of the Environment on May 29, 2015 and was deemed complete on July 29, 2015.

14. The Transmission Project and the cost of connecting to Hydro One's transmission facilities will be paid for by the Applicant. Therefore the cost the Transmission Project and the connection to Hydro One's transmission facilities will have no impact on transmission rates in Ontario. Discussions between the Applicant and HONI are ongoing regarding cost responsibility for any remote upgrades required by HONI to its transmission system.

15. This Application is supported by written evidence that is consistent with the Board's *Filing Requirements for Electricity Transmission Applications, Chapter 4* dated July 31, 2014 (the "**Filing Requirements**"). The Applicant's written evidence may be amended from time-to-time, prior to the Board's final decision on this Application. To assist the Board, a Table of Concordance has been appended to this schedule that cross-references the requirements set out in the Filing Requirements with the Application.

16. The Applicant requests that pursuant to section 34 of the Board's *Rules of Practice and Procedure* this proceeding be conducted by way of written hearing.

17. The Applicant requests that a copy of all documents filed with the Board in this proceeding be served on its authorized representatives as follows:

    (a) The Applicant:

    SP Belle River Wind LP
    c/o Samsung Renewable Energy Inc.
    2050 Derry Road West – 2nd Floor
    Mississauga, Ontario
    L5N 0B9

    Attention: Ajeet K. Grover
    Telephone: (905) 501-4795
    Fax: (905) 285-1852
    E-mail: ajeet.grover@samsung.com

With a copy to:

SP Belle River Wind LP
c/o Pattern Renewable Holdings Canada ULC
355 Adelaide Street West, Suite 100
Toronto, Ontario
M5V 1S2

Attention: Kim Sachtleben
Telephone: (416) 263-8025
Fax: (416) 979-8428
Email: kim.sachtleben@patternenergy.com

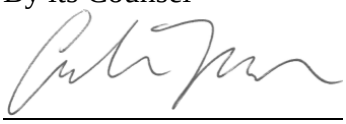
(b) The Applicant's Counsel:

The Energy Boutique
120 Adelaide Street West
Suite 2500
Toronto, Ontario
M5H 1T1

Attention: Andrew Taylor
Telephone: (416) 644-1568
Fax: (416) 367-1954
Email: ataylor@energyboutique.ca

Dated at Toronto, Ontario, this 7th day of January, 2016.

SP Belle River Wind LP
By its Counsel



Andrew Taylor

Table of Concordance

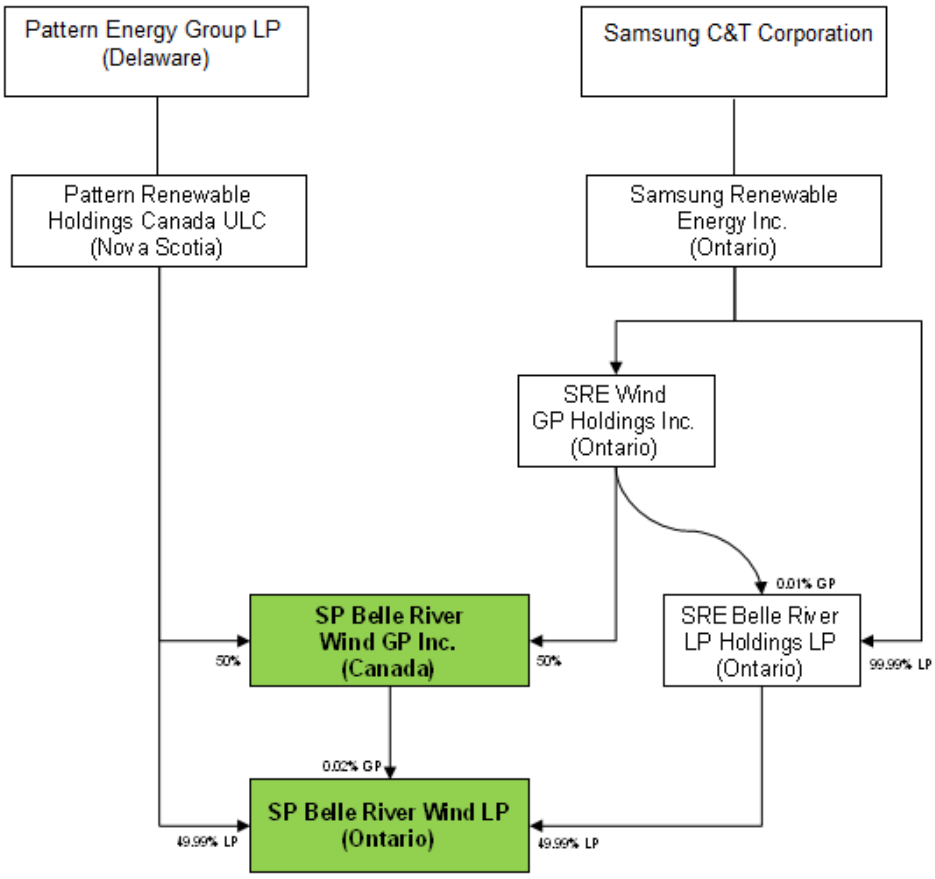
Filing Requirements Reference	Description	Evidence Reference
4.4.1	Index	Exhibit A, Tab 1, Schedule 1
4.4.2	Application	Exhibit B, Tab 1, Schedule 1
4.4.2.1	Administrative:	
	• the name of the applicant and any partnerships involved in the application	Exhibit B, Tab 1, Schedule 1, Paragraphs 1 and 2
	• details of the authorized representative of the applicant, including the name, phone and fax numbers, and email and delivery addresses	Exhibit B, Tab 1, Schedule 1, Paragraph 17
	• an outline of the business of the applicant and the parties to the application	Exhibit B, Tab 2, Schedule 1, Section 1
	• an explanation of the purpose of the project for which leave to construct is being sought	Exhibit B, Tab 2, Schedule 1, Section 3
	• a concise description of the routing and location of the project, including the affected municipalities and regions	Exhibit B, Tab 2, Schedule 1, Section 4 Exhibit C, Tab 1, Schedule 1
	• an indication of any shared corridors where there could be cross circuit interference, and of any issues related thereto with the owning authority	N/A
	• a description of project components and their locations, activities, and related undertakings	Exhibit B, Tab 2, Schedule 1, Section 4 Exhibit C, Tab 1, Schedule 1
	• an explanation of how the project is in the public interest, as defined by section 96(2) of the Act	Exhibit B, Tab 2, Schedule 1, Section 3
	• the current project schedule	Exhibit B, Tab 2, Schedule 1, Section 7
4.4.2.2	Project Overview Documents:	
	• Project Overview Description	Exhibit B, Tab 2, Schedule 1
	• a detailed description of location of the project and its components	Exhibit B, Tab 2, Schedule 1, Section 4 Exhibit C, Tab 1, Schedule 1
	• maps (1:50,000 or larger) showing: the route, facility sites and any proposed ancillary facilities	Exhibit C, Tab 2, Schedule 1
	• a draft of a drawing suitable for publication with the Notice of Hearing	Exhibit B, Tab 2, Schedule 1, Appendix 'A'
	• line drawings of the proposed facility,	Exhibit C, Tab 3, Schedule 1

	showing supply connection(s) to the proposed facility and delivery facilities from the proposed facility to any adjacent transmission and/or distribution system(s)	
	• the nominal rating of the main components of the project, including transformers	Exhibit B, Tab 2, Schedule 1, Section 4 Exhibit C, Tab 1, Schedule 1
4.4.2.3	Evidence in Support of Need	Exhibit B, Tab 3, Schedule 1
4.4.2.4	Impact on Rate-Regulated Transmitter	Exhibit G, Tab 1, Schedule 1
4.4.2.5	Apportioning of Project Costs	N/A (see Exhibit G, Tab 1, Schedule 1)
4.4.2.6	Connection Projects Requiring Network Reinforcement	N/A (see Exhibit G, Tab 1, Schedule 1)
4.4.3.1	The Route	Exhibit B, Tab 2, Schedule 1, Section 4 Exhibit C, Tab 1, Schedule 1
4.4.3.2	Description of the Physical Design	Exhibit C, Tab 1, Schedule 1
4.4.3.3	Maps	Exhibit C, Tab 2, Schedule 1
4.4.4.1	Operational Details	Exhibit D, Tab 1, Schedule 1
4.4.5.1	Description of Land Rights	Exhibit E, Tab 1, Schedule 1
4.4.5.2	Land Easements Required	Exhibit E, Tab 1, Schedule 1
4.4.5.3	Early Access to Land	N/A
4.4.5.4	The Land Acquisition Process	Exhibit E, Tab 1, Schedule 1
4.4.5.5	Land-Related Forms	Exhibit E, Tab 1, Schedule 2
4.4.6	System Impact Assessment	Exhibit F, Tab 1, Schedule 3
4.4.7	Customer Impact Assessment	Exhibit G, Tab 1, Schedule 2

PROJECT OVERVIEW

1. The Applicant and Its Partners

The Applicant is SP Belle River Wind LP (the "**Applicant**") by its general partner SP Belle River Wind GP Inc. An organizational chart that illustrates the structure of the Applicant and its partners is set out below:



The following is information on the Applicant and the ultimate parent companies of its partners:

i. The Applicant

The Applicant is a limited partnership that was formed pursuant to the laws of the Province of Ontario on May 6, 2014 for the purposes of managing the development, construction and operation of an up to 100 MW wind generation facility known as the Belle River Project (the "**Wind Farm**"). The Applicant's two limited partners are Pattern Renewable Holdings Canada ULC ("**Pattern**") and an affiliate of Samsung Renewable Energy Inc. ("**Samsung**"), each holding a 49.99% interest in the Applicant. The general partner of the Applicant is SP Belle River Wind GP Inc., which is indirectly wholly owned by Pattern and an affiliate of Samsung, holds a 0.02% interest in the Applicant.

ii. Pattern Energy Group LP ("**PEG**")

PEG, Pattern's parent company, is one of North America's leading independent wind and transmission companies. Its mission is to provide its customers with clean, renewable energy, which it seeks to achieve by developing, constructing, owning and operating projects that are built for lasting success. PEG has projects totalling over 520 MW in operation and has many years of experience developing, managing construction and operating both High Voltage AC and DC transmission lines. This includes the 52 mile Trans Bay Cable - a 400 MW DC undersea transmission project serving approximately 40% of the load in the city of San Francisco. The PEG team has developed, permitted, financed, constructed and operated over one hundred miles of high voltage AC transmission lines associated with the wind farms they have developed.

In addition, PEG is growing and building on its current development pipeline, which includes over 4,000 MW of wind power and multiple transmission projects in the United States, Canada and Latin America.

PEG is a U.S. based company led by a committed and seasoned management team whose members, each with over 20 years' experience in the energy industry, have worked together for nearly 10 years. As a team they have developed, financed and managed more than $4 billion of energy assets. PEG's subsidiary, Pattern (a limited partner of the Applicant), has an office in Toronto.

Both PEG and Pattern's senior management team is supported by a deep and talented group of developers, engineers, financial experts, and construction and operations specialists who bring expertise and a rigorous analytical perspective to all aspects of their business.

iii. Samsung C&T Corporation

Samsung is a wholly-owned subsidiary of Samsung C&T Corporation, which is a Korea-based company engaged in the construction and trading business. It operates its business under two divisions:

1) Its construction business division is engaged in construction works, such as commercial and residential building construction; civil engineering works, including construction of subways, roads, bridges, harbours, airports and large-scale reclamation projects; and plant building, covering nuclear power plants, electric power plants, energy storage and transmission facilities, petrochemical plants, industrial facilities and environmental facilities, as well as housing development and other related services.

2) Its trading business division exports and imports chemicals, steel products, nonferrous metals, transportation equipment, textiles, apparels, daily necessities and others. The company, formerly known as Samsung Corporation, was founded in 1938 and is headquartered in Seoul, South Korea. It is a public company whose shares trade on the Korea Stock Exchange.

iv. OEB-Licensed Projects in Ontario

Other electricity infrastructure projects in Ontario that the Applicant's partners are involved in include:

- SP Armow Wind Ontario LP ("**Armow Wind**") (EG-2014-0269) is the owner of a 180 MW wind generation facility located in Kincardine, Ontario. The project achieved

commercial operation on December 7, 2015. Armow Wind is also a 50/50 joint venture between Pattern and an affiliate of Samsung. The project consists of 91 Siemens Energy wind turbines (Model SWT-2.3-10).

- K2 Wind Ontario Limited Partnership ("**K2 Wind**") (EG-2013-0439) is a 270 MW wind power project located in ACW Township, Ontario. The project reached commercial operation in June 2015. K2 Wind is a joint venture partnership equally owned by Capital Power LP, Pattern and an affiliate of Samsung (each indirectly holding a 33% equity interest). The project consists of 140 Siemens Energy wind turbines (Model SWT-2.3-10).

- Grand Renewable Wind LP ("**Grand Wind**") (EG-2012-0350) is the owner of a 149 MW wind generation facility located in Haldimand County, Ontario. Grand Wind is a joint venture partnership between Pattern (45%), an affiliate of Samsung (45%) and an affiliate of the Six Nations of Grand River (10%). The project consists of 67 Siemens Energy wind turbines (Model SWT-2.3-10).

- South Kent Wind LP ("**South Kent**") (EG-2011-0330) is the owner of a 270 MW wind generation facility located in the Regional Municipality of Chatham-Kent in southwestern Ontario. South Kent is a 50/50 joint venture partnership between Pattern and an affiliate of Samsung. The project consists of 124 Siemens Energy wind turbines (Model SWT-2.3-10).

- North Kent Wind 1 LP ("**North Kent**") is the owner of a development-phase 100 MW wind generation facility located in the Regional Municipality of Chatham-Kent in southwestern Ontario. North Kent is a 50/50 joint venture partnership between Pattern and an affiliate of Samsung and is scheduled to achieve commercial operation in 2017.

2. Approval Sought

The Applicant applies to the Ontario Energy Board (the "**Board**") pursuant to section 92 of the *Ontario Energy Board Act, 1998* (the "**Act**") for an order or orders granting leave to construct the following facilities, all within the Town of Lakeshore in the County of Essex, to connect the Wind Farm to the Hydro One Networks Inc. ("**Hydro One**") transmission system:

i. on the generation side, a 230 kV/34.5 kV substation (the "**Joe Byrne Substation**");
ii. an approximately 7km three-phase single circuit 230kV overhead transmission line (the "**Transmission Line**") that will run from the Joe Byrne Substation to a switching station described in (iii) below;
iii. a 230 kV switching station (the "**Brody Switching Station**") at the connection point on Hydro One's transmission system. (collectively, the Brody Switching Station together with the Joe Byrne Substation and the Transmission Line, the "**Transmission Project**")

3. Need for the Transmission Project

The Government of Ontario entered into a Green Energy Investment Agreement (the "**Agreement**") on January 21, 2010 with Samsung C&T Corporation (which wholly-owns Samsung and is referred to herein as, the "**Samsung Parent**") and Korea Electric Power Corporation ("**KEPCO**"). The Agreement was subsequently amended on July 29, 2011 and June 20, 2013, and a copy of the fully amended and restated version of the Agreement (dated as of June 20, 2013) is attached hereto at Exhibit B, Tab 3, Schedule 1, Appendix 'C'.

Through its indirect ownership interest in the Applicant, Samsung along with its development partner Pattern will develop the Wind Farm of up to 100-MW located within the Town of Lakeshore, County of Essex. On September 22, 2014, the Applicant entered into a 20-year Power Purchase Agreement with the Ontario Power Authority (the "**OPA**"), and legally succeeded by the Independent Electricity System Operator (the "**IESO**").

The Wind Farm will further the Ontario Government's policy objective to increase the amount of renewable energy generation being added to the province's energy supply mix. In particular, the

Wind Farm will contribute a total of up to 100 MW of clean, renewable energy to the provincial electricity grid.

The purpose of this Application is to construct the Transmission Project to connect the Wind Farm to the IESO-controlled grid. As the development of the Wind Farm promotes the use of renewable energy sources in a manner consistent with the policies of the Government of Ontario, the Transmission Project is in the public interest pursuant to paragraph 96(2)(2) of the Act.

4. Transmission Project Location and Components

This section describes the locations of the proposed transmission facilities, as well as the locations of facilities that are ancillary to the Transmission Project, including the Wind Farm and its collector system, and the Hydro One transmission system to which the Transmission Project will connect. While detailed project maps are provided in Exhibit C, Tab 2, Schedule 1, in accordance with the Board's Filing Requirements, this Project Overview includes, at Appendix 'A' attached hereto a draft drawing suitable for publication with the Notice of Hearing and, at Appendix 'B', a simple single line drawing of the Transmission Project.

i. The Wind Farm and Collector System

The Wind Farm will be located in the Town of Lakeshore in the County of Essex, Ontario on public and private lands south of the community of Belle River. Its location was established based on interest expressed by local landowners, the availability of wind resources and availability of existing infrastructure for connection to the electrical grid.

The Wind Farm will be comprised of approximately forty-one (41) Wind Turbine Generators ("**WTGs**"). The maximum generation capacity of some of the WTGs will be permanently de-rated based on noise compliance requirements so that the total project output will not exceed 100 MW. The WTGs will connect to the Joe Byrne Substation via four 34.5 kV collectors.

A map that illustrates the location of the Wind Farm is at Exhibit C, Tab 2, Schedule 1(i).

ii. The Joe Byrne Substation

The 230 kV/34.5 kV Joe Byrne Substation will be located on private property on the east side of Lakeshore Road 125 just north of Byrnedale Road in the Town of Lakeshore in the County of Essex, Ontario. Its location is illustrated by the map at Exhibit C, Tab 2, Schedule 1(ii).

The Joe Byrne Substation will consist of the main 34.5 kV switchgear B1 bus and a main transformer rated 66/88/110 MVA, 240/34.5 kV with an under load tap changer.

A single line diagram of the Joe Byrne Substation is at Exhibit C, Tab 3, Schedule 1(ii). An illustration of the layout of the Joe Byrne Substation is at Exhibit C, Tab3, Tab 1(v).

iii. The Transmission Line

Components

From the 230 kV Joe Byrne Substation, a three phase single circuit 230 kV overhead transmission line, approximately 7 km in length, will connect to the 230 kV Brody Switching Station. Approximately 35 self-supporting steel pole structures with average spans of 160-180 m will be installed on private land and Municipal road allowance to carry the Transmission Line conductors and aluminum clad steel shield wire with optical fibers. All the steel poles will be galvanized and will have concrete foundations.

The horizontal and vertical clearance of the Transmission Line from ground will be as per CSA C22.3 1-06 Standard. Along the proposed route, the Transmission Line will require approximately 8-10 m of width within the municipal road allowance.

Please refer to Exhibit C, Tab 3, Schedule 1(iv) for pole an illustration of steel pole configuration and framing drawings. Please refer to Exhibit C, Tab 3, Schedule 1(vii) for Transmission Line plan and profile drawings.

Proposed Transmission Route

The Transmission Line will run west from the Joe Byrne Substation towards the Lakeshore Road 125 for approximately 115 m (Transmission Pole #1 to Transmission Pole #2). The Transmission Line will then turn south and run along the Lakeshore Road 125 road allowance for approximately 430m and cross the Byrnedale Road (Transmission Pole #2 to Transmission Pole #4). The Transmission Line will continue to run south along the unopened road allowance of the Lakeshore Road 125 for approximately 1.2 km (Transmission Pole #4 to Transmission Pole #11) and cross the Highway 401. After crossing the Highway 401, it will continue to run south along the unopened road allowance of Wheatfield Road for approximately 1 km (Transmission Pole #12 to Transmission Pole #18) until it reaches N Middle Road. At N Middle Road, it will turn east and run along the road allowance of N Middle Road for approximately 900m (Transmission Pole #18 to Transmission Pole #23) until it reaches French Line Road. At French Line Road, it will turn south and run approximately 1.9 km along the road allowance of the French Line Road (Transmission Pole #23 to Transmission Pole #35) and then turn west to enter the Brody Switching Station.

A map of the Transmission Line's route is at Exhibit C, Tab 2, Schedule 1(ii).

iv. The Brody Switching Station

The 230 kV Brody Switching Station will be located on private property, adjacent to the Hydro One existing 230 kV transmission line on the west side of French Line Road, as illustrated by the map at Exhibit C, Tab 2, Schedule 1(ii). The Transmission Line will connect to Hydro One's transmission system via the Brody Switching Station at connection point C23Z.

The switching station area will be approximately 60m x 45m and will be an open air facility surrounded by a chain link fence. The main components of the switching station will be two dead-end towers, a 230 kV circuit breaker, two disconnect switches, capacitive voltage transformer, current transformer, potential transformer, surge arrestors, station service transformer and a control building. The control building will house the batteries, chargers and protection and control relays.

A single line diagram of the Brody Switching Station is at Exhibit C, Tab 3, Schedule 1(iii). An illustration of the layout of the Brody Switching Station is at Exhibit C, Tab3, Tab 1(vi).

5. Land Matters

Matters relating to the land rights required for the Transmission Project, as well as the Applicant's land acquisition process, are described in detail in Exhibit E. In summary, with respect to the acquisition of private land rights for the Joe Byrne Substation and the Brody Switching Station, the Applicant has entered into an option to lease for the Joe Byrne Substation, and will shortly enter into an option to lease for the Brody Switching Station. For the Transmission Line, the Applicant is in advanced negotiations with the Town of Lakeshore respecting a road use agreement and anticipates finalizing same shortly. The Applicant is also entering into discussions regarding a Road Use Agreement with the County of Essex.

6. Renewable Energy Approval

The Applicant is subject to the requirements of the Renewable Energy Approval ("**REA**") process under Ontario Regulation 359/09 under the *Environmental Protection Act*. The final REA submission package for the Wind Farm was submitted to the Ministry of Environment and Climate Change on May 29, 2015 and was deemed complete on July 29, 2015.

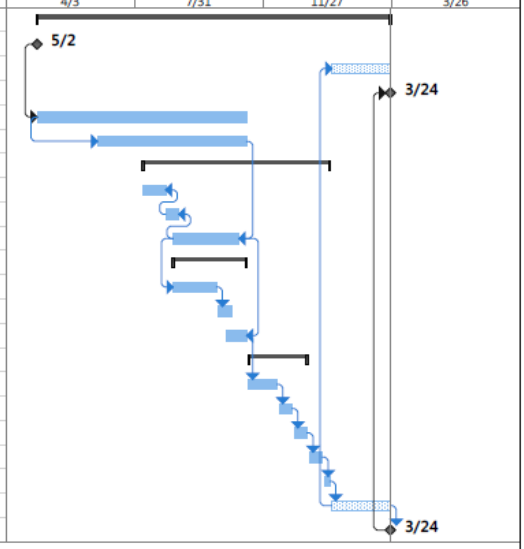
7. Construction and In-Service Schedule

The Transmission Project will be constructed in accordance with applicable technical codes and standards, including the *Canadian Electrical Code, Part III* (which incorporates by reference *CSA Standard C22.3 No. 1 - Overhead Systems*), as well as relevant IEEE transmission line design and construction standards, such as *IEEE 524-2004 - Guide to the Installation of Overhead Transmission Line Conductors*. The Transmission Project and its construction will also comply with applicable requirements of the *Ontario Electrical Safety Code*, the *Occupational Health and Safety Act* (Ontario), the *Transmission System Code*, the *Market Rules for the Ontario Electricity Market*, including with respect to metering, and requirements specified in the final *System Impact Assessment*, *Customer Impact Assessment* and REA.

The Applicant plans to commence construction of the Transmission Project in the summer of 2016. Construction is expected to take approximately 12months to complete. The Transmission Project would then be commissioned and would be put into service by approximately summer of 2017. The following Gantt chart illustrates the planned construction schedule for the Transmission Project.

Belle River Wind Project
230KV Transmission Line - Project Schedule

ID	Task Mode	Task Name	Start	Finish
1		**Project duration**	**5/2/2016**	**3/24/2017**
2		Project start	5/2/2016	5/2/2016
3		Float to allow for delays	1/30/2017	3/24/2017
4		In service	3/24/2017	3/24/2017
5		Engineering - 230kV TL	5/2/2016	11/11/2016
6		Procurement -230kV TL	6/27/2016	11/11/2016
7		**Construction**	**8/8/2016**	**1/27/2017**
8		Mobilization	8/8/2016	8/29/2016
9		Access road & staking	8/29/2016	9/9/2016
10		Concrete foundations for deadend poles and curing period	9/5/2016	11/4/2016
11		**Pole installation**	**9/5/2016**	**11/11/2016**
12		Interconnection station to Hway 401	9/5/2016	10/14/2016
13		Substation to Hway 401	10/17/2016	10/28/2016
14		Steel poles on foundations	10/24/2016	11/11/2016
15		**Conductor & Sheldwire stringing**	**11/14/2016**	**1/6/2017**
16		Interconnection station to Hway 401	11/14/2016	12/9/2016
17		Substation to Hway 401	12/12/2016	12/23/2016
18		Highway crossing	12/26/2016	1/6/2017
19		Transmission line inspection and demob.	1/9/2017	1/20/2017
20		commissioning	1/23/2017	1/27/2017
21		Float to allow for delays	1/30/2017	3/24/2017
22		In service	3/24/2017	3/24/2017



Project: BRW Wind Transmissio
Date: 12/23/2015

Task
Split
Milestone
Summary
Project Summary
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
External Tasks
External Milestone
Deadline
Progress
Manual Progress

8. Impact Assessments

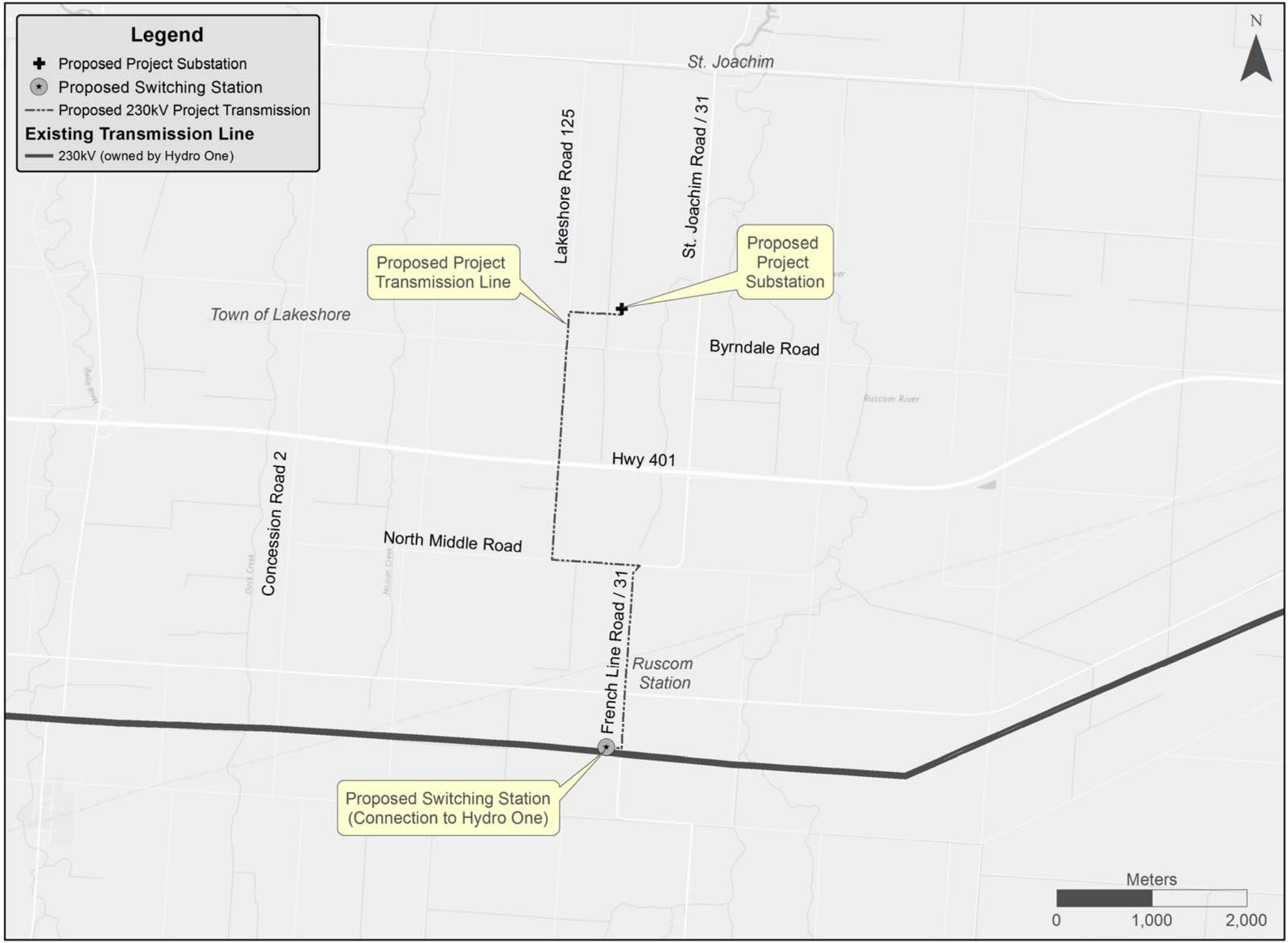
Matters relating to the Applicant's System Impact Assessment are discussed in Exhibit F and the Customer Impact Assessment is discussed in Exhibit G. In summary, the Applicant received a final System Impact Assessment Report ("**SIA**") from the IESO for the Wind Farm on December 11, 2015. The SIA concludes that, subject to certain requirements set out therein, the proposed connection is expected to have no material adverse impacts on the reliability of the integrated power system. The Applicant received from the IESO a *Notification of Conditional Approval for Connection* (the "**Notification**") on December 11, 2015. The SIA is at Exhibit F, Tab 1, Schedule 3 and the Notification is at Exhibit F, Tab 1, Schedule 2.

The Applicant also received a final Customer Impact Assessment Report ("**CIA**") from Hydro One on December 11, 2015. The CIA concludes that the Wind Farm can be incorporated via the Transmission Project without adverse impacts on Hydro One's customers in the area. The CIA is at Exhibit G, Tab 1, Schedule 2.

9. Transmission Project Costs

The costs of the Transmission Project will be entirely borne by the Applicant and, as such, the Transmission Project will not affect electricity transmission rates in Ontario. As well, Hydro One has not identified any Network upgrades that will be required as a result of the Transmission Project.

Appendix 'A' - Draft Map for Notice of Hearing

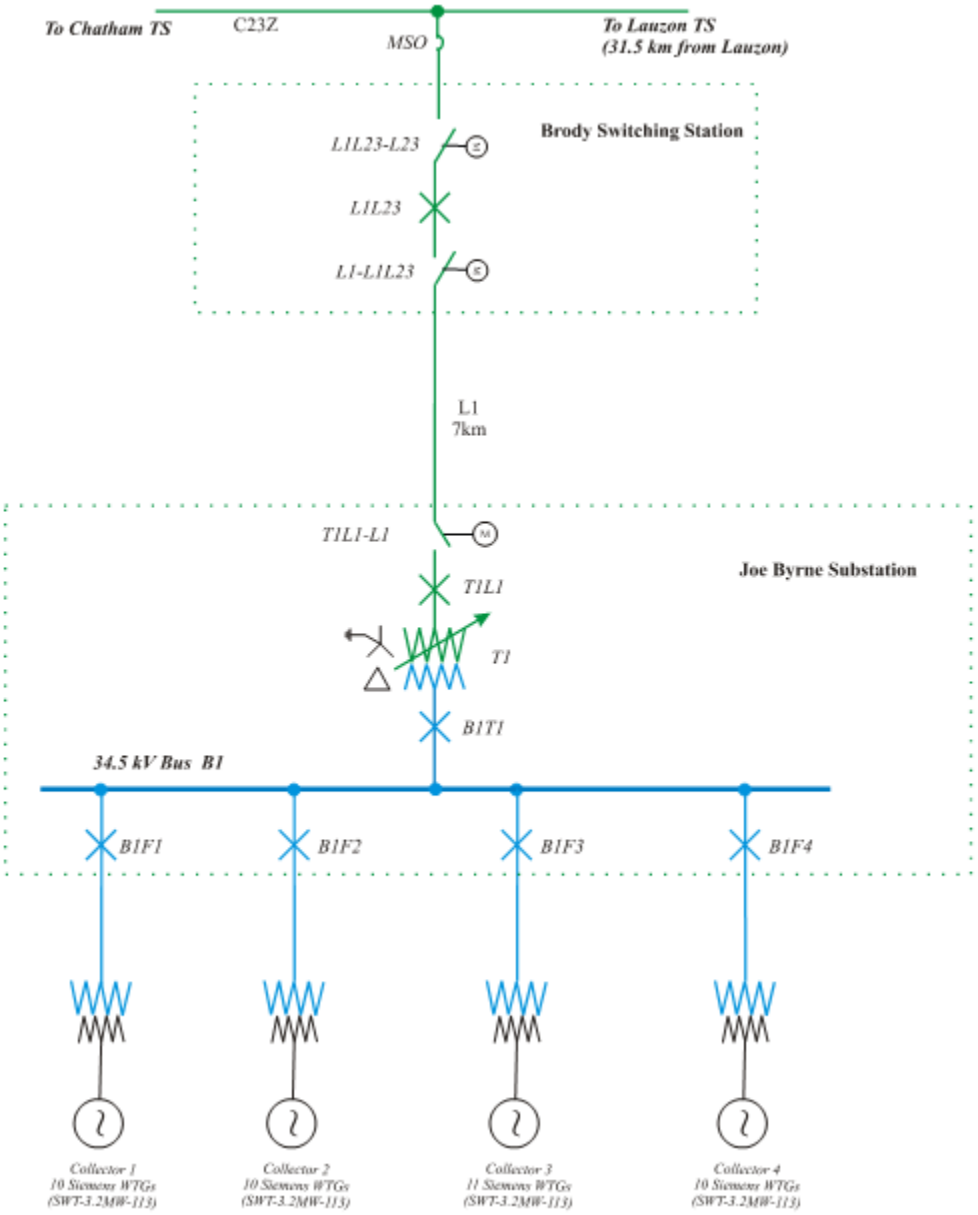


Belle River Wind: Proposed Infrastructure

Privileged and Confidential
10 December 2015 | AHW

Appendix 'B' - Single Line Diagram of the Transmission Project

Single Line Diagram of the Transmission Project



NEED FOR THE PROJECT

The Government of Ontario entered into a Green Energy Investment Agreement (the "**Agreement**") on January 21, 2010 with Samsung C&T Corporation (which wholly-owns Samsung, and is referred to herein as, the "**Samsung Parent**") and Korea Electric Power Corporation ("**KEPCO** "). The Agreement was subsequently amended on July 29, 2011 and June 20, 2013, and a copy of the fully amended and restated version of the Agreement (dated as of June 20, 2013) is at Exhibit B, Tab 3, Schedule 1, Appendix 'C'.

Through its indirect ownership interest in the Applicant, Samsung along with its development partner Pattern will develop the Wind Farm of up to 100-MW located within the Town of Lakeshore, County of Essex. The Applicant entered into a 20-year Power Purchase Agreement with the OPA on September 22, 2014.

The Wind Farm will further the Ontario Government's policy objective to increase the amount of renewable energy generation being added to the province's energy supply mix. In particular, the Wind Farm will contribute up to 100 MW of clean, renewable energy to the provincial electricity grid.

The Transmission Project is needed to connect the Wind Farm to the IESO-controlled grid. As the development of the Wind Farm promotes the use of renewable energy sources in a manner consistent with the policies of the Government of Ontario, the Transmission Project is in the public interest pursuant to paragraph 96(2) of the *Ontario Energy Board Act, 1998* (the "**Act**").

Subsection 96(2) of the Act provides:

> **96. (2)** In an application under section 92, the Board shall only consider the following when, under subsection (1), it considers whether the construction, expansion or reinforcement of the electricity transmission line or electricity distribution line, or the making of the interconnection, is in the public interest:
>
> 1. The interests of consumers with respect to prices and the reliability and quality of electricity service.

2. **Where applicable and in a manner consistent with the policies of the Government of Ontario, the promotion of the use of renewable energy sources**. [emphasis added]

Appendix 'C' - Green Energy Investment Agreement

AMENDED AND RESTATED

GREEN ENERGY INVESTMENT AGREEMENT

BY AND AMONG

HER MAJESTY THE QUEEN IN RIGHT OF ONTARIO
as represented by
the Minister of Energy

AND

KOREA ELECTRIC POWER CORPORATION

AND

SAMSUNG C&T CORPORATION

JUNE 20, 2013

The **Green Energy Investment Agreement** made by and among the following parties (collectively the "**Parties**" and individually a "**Party**") as of the 21st day of January, 2010, as amended by an amending agreement made as of July 29, 2011, is hereby amended and restated as of this 20th day of June, 2013:

Her Majesty the Queen in Right of Ontario, as represented by the Minister of Energy (hereinafter referred to as the "**Government of Ontario**"), with offices at **Hearst Block, 4th Floor, 900 Bay Street, Toronto, Ontario, Canada, M7A 2E1;**

- and -

Korea Electric Power Corporation (hereinafter referred to as "**KEPCO**") a company organized and validly existing under the laws of the Republic of Korea, whose principal office is at **411, Yeongdongdaero, Gangnam-Gu, Seoul 135-791 Korea;**

- and -

Samsung C&T Corporation (hereinafter referred to as "**Samsung**") a company organized and validly existing under the laws of the Republic of Korea, whose principal office is at **Samsung C&T Corporation Bldg., 1321-20, Seocho 2-Dong, Seocho-Gu, Seoul 137-857, Korea**.

RECITALS

(A) **WHEREAS,** the Government of Ontario is committed to developing, enhancing and diversifying the Province of Ontario's renewable energy power generation capacity, and wishes to supplement the Province of Ontario's significant and growing commitment to renewable energy power generation with the development of manufacturing capability in the area of higher value added materials and equipment used in the generation of renewable power energy and, accordingly, desires to undertake the initiative described herein;

(B) **WHEREAS**, the Korean Consortium intends to develop, construct and operate wind and solar generation projects in Ontario which in total aggregate up to 1,369 MW of capacity (1,069MW for Phases 1 and 2 and 300 MW for Phase 3) and, with its Manufacturing Partners, to establish and operate facilities in Ontario for the manufacture of wind and solar generation equipment and components (the "**Project**"), which is estimated to create approximately 900 jobs in Ontario;

(C) **WHEREAS**, the Parties entered into a Memorandum of Understanding dated December 12, 2008 to set forth the basic principles and understanding for the establishment of their cooperation as well as discussions and negotiations pertaining to the Project;

(D) **WHEREAS**, the Government of Ontario has enacted historic legislation, namely the *Green Energy and Green Economy Act, 2009*, the purpose of which is to provide the framework for a burgeoning green economy within Ontario, and welcomes the Korean Consortium's participation in that economic endeavour;

(E) **WHEREAS**, the Parties entered into the Green Energy Investment Agreement dated as of January 21, 2010, as amended pursuant to an amending agreement dated as of July 29, 2011 (collectively, the "**Original Agreement**");

(F) **WHEREAS**, the Parties desire to amend and restate the Original Agreement as set forth herein; and

(G) **WHEREAS**, the Parties hereby set forth the following detailed principles and conditions of cooperation for the successful implementation of the Project.

NOW THEREFORE, in consideration of the mutual covenants and agreements contained herein, the Parties agree as follows:

ARTICLE 1. DEFINITIONS AND INTERPRETATION

1.1 In this Agreement, the following words, terms and phrases shall have the meanings ascribed to them below:

"**Aboriginal Peoples**" means the Indian, Inuit and Métis peoples of Canada as referred to in s. 35 of the *Constitution Act, 1982*, being Schedule B to the *Canada Act 1982 (U.K.), 1982*, c.11.

"**Aboriginal Communities**" means any group of Aboriginal Peoples identified by the Government of Ontario in the course of the Aboriginal consultation/engagement protocols.

"**Aboriginal Price Adder**" has the meaning ascribed thereto in the FIT Rules.

"**Access Rights**" has the meaning ascribed thereto in the FIT Rules.

"**Agreement**" means this Agreement, including its recitals and schedules, as amended from time to time.

"**Applicable Laws**" means any applicable law, statute, by-law, ordinance, decree, requirement, directive, order, judgment, license, permit, code, rules or regulation having the force of law, and any applicable determination, interpretation, ruling, order or decree of any governmental authority which is legally binding at such time. For greater certainty, "Applicable Laws" includes all codes issued by the OEB (under the auspices of the *Ontario Energy Board Act 1998)* including the Transmission System Code and the Distribution System Code, as amended from time to time, as well as the Market Rules issued by the Independent Electricity System Operator under Part III of the *Electricity Act, 1998*.

"**Bulk Transmission System**" means the Transmission System excluding connection facilities, as "connection facilities" is defined by Applicable Laws.

"**Capacity**" means, in respect of a Generation Facility, the manufacturer's nameplate rated capacity, expressed in megawatts (MW), to generate Electricity, and includes the Electricity generation capacities of all the generation units of the Generation Facility.

"**Commercial Operation Date**" means, in respect of a Generation Facility, the day on which the facility first achieves Commercial Operation, as defined in the FIT Contract.

"**Community Price Adder**" has the meaning ascribed in the FIT Rules.

"**Component**" means each of (i) blades, (ii) towers, (iii) solar inverters and (iv) solar modules, Solar MV Station and/or any other equipment or component associated with a solar Generation Facility ((iii) and (iv) collectively, "**Solar Component**s") and refers to all of the units of that Component forming part of a Generation Facility.

"**Control**" has the meaning ascribed thereto in the FIT Rules.

"**Customer Impact Assessment**" means the customer impact assessment provided for in section 6.4 of the Transmission System Code issued by the Ontario Energy Board.

"**Distribute**" means with respect to Electricity, means to convey Electricity at voltages of 50 kilovolts or less and "Distributing" has the corresponding meaning.

"**Distribution System**" means a system for Distributing Electricity, and includes any structure, equipment or other things used for that purpose.

"**Domestic Content**" means the target under the FIT Rules for domestic or provincial manufacturing.

"**Duty to Consult**" means any duty that the Government of Ontario or any other ministry or agent of Her Majesty the Queen in right of Ontario may have to consult and, where appropriate, accommodate Aboriginal Peoples in respect of a the relevant parts of the Project or activities related to it.

"**Economic Development Adders**" means the amounts calculated in accordance with the provisions of Article 9, expressed in cents (¢) per kWh.

"**Electricity**" means electric energy measured in kilowatt-hours (kWh).

"***Electricity Act, 1998***" means the *Electricity Act, 1998*.

"**FIPPA**" means the *Freedom of Information and Protection of Privacy Act*.

"**FIT**" means Feed-In Tariff.

"**FIT Contract**" has the meaning ascribed thereto in the FIT Rules.

"**FIT Program**" means the Feed-In Tariff program as it exists from time to time arising from a direction or directions issued by the Minister pursuant to s. 25.35 of the *Electricity Act, 1998*.

"**FIT Rules**" means the rules set out in the Feed-in Tariff Program as same may be amended in accordance with its terms from time to time.

"**Generation Facility**" means a renewable energy generation facility located in Ontario, which generates Electricity exclusively from wind or solar (PV), and that is constructed, developed and operated by the Korean Consortium, Samsung, KEPCO and/or a Project Company.

"**Hourly Delivered Electricity**" means the Electricity generated and delivered to the Transmission System or a Distribution System in Ontario during any hour.

"**Jobs**" means the number of employees of a Manufacturing Partner at a Manufacturing Plant, such number to be calculated in accordance with the provisions of Article 8.2.

"**Jobs Documentation**" has the meaning ascribed thereto in Article 9.3.2(a).

"**Joint Instruction**" means an instruction to the OPA substantially in the form of Schedule A.

"**Korean Consortium**" means KEPCO and Samsung, collectively.

"**Manufacture**" means the application of processes to transform one or more subcomponents or raw materials into a Component which cannot be separated back into a subcomponent without destroying the subcomponent's or Component's integrity and "**Manufacturing**" has the corresponding meaning. For the purpose of this Agreement, manufacturing of towers, blades, solar inverters and assembly of solar modules under this Agreement shall be deemed to be Manufacturing.

"**Manufacturing Partner**" means a person who Manufactures a Component, as may be identified by the Korean Consortium.

"**Manufacturing Plant**" means a facility in Ontario at which a Manufacturing Partner Manufactures a Component.

"**Minister**" means the Minister of Energy or such other member of the Executive Council of Ontario as may be assigned responsibility for matters related to this Agreement.

"**Notice to Proceed**" has the meaning ascribed thereto under the applicable PPA.

"**OEB**" means "Ontario Energy Board" as established pursuant to Part II of the *Ontario Energy Board Act, 1998*.

"***Ontario Energy Board Act, 1998***" means the *Ontario Energy Board Act, 1998*.

"**OPA**" means the Ontario Power Authority and its successors and assigns.

"**Original Agreement**" has the meaning ascribed thereto in Recital (E).

"**PPA**" means a power purchase agreement between the Project Company and the OPA entered into in accordance with Article 9.

"**Phase**" refers to Phase 1, Phase 2 or Phase 3 as described in Articles 3.1 and 3.2 and "**Phases**" refers to more than one Phase.

"**Point of Connection**" has the same meaning as "connection point" in the Ontario Energy Board's Transmission System Code.

"**Price Schedule**" means the schedule of the Feed-In Tariff Prices for Renewable Energy Projects in Ontario as determined by OPA in accordance with the FIT Rules from time to time.

"**Project**" has the meaning ascribed thereto in Recital (B).

"**Project Company**" has the meaning set out in Article 4.1.

"**R&D Center**" means a facility in Ontario at which a Manufacturing Partner conducts a research and/or development activities in relation to any Component, renewable energy generation facilities and/or renewable energy generation projects.

"**Solar Component**s" has the meaning ascribed thereto in the definition of "Component."

"S**olar MV Station**" means a solar medium voltage inverter and transformer station.

"**System Impact Assessment**" means the system impact assessment provided for in section 6.1.6 of chapter 4 of the Independent Electricity System Operator market rules.

"**Targeted Generation Capacity**" means the Capacity targeted for each Phase and is described in Articles 3.1 and 3.2.

"**Transmission System**" means a system for conveying Electricity at voltages of more than 50 kilovolts and includes any structures, equipment or other things used for that purpose.

1.2 **Extended Meanings**

In this Agreement, words importing the singular number include the plural and vice versa, words importing any gender include all genders and words importing persons include individuals, corporations, limited and unlimited liability companies, general and limited partnerships, associations, trusts, unincorporated organizations, joint ventures and governmental authorities. The term "including" means "including without limiting the generality of the foregoing."

1.3 **Statutory References**

In this Agreement, unless something in the subject matter or context is inconsistent therewith or unless otherwise herein provided, a reference to any statute, regulation or rule is to that statute, regulation or rule as now enacted and as the same may from time to time be amended, re-enacted or replaced and any reference to a statute, includes any regulation made thereunder.

1.4 **Currency**

All references to currency herein are to lawful money of Canada and any amount disbursed, paid or calculated in accordance with the terms hereof is to be disbursed, paid or calculated in Canadian currency.

1.5 **Schedules**

All references to Schedules refer to Schedules of this Agreement that are part of and form an integral part of this Agreement. The Schedules of this Agreement are:

Schedule A - Joint Instruction

1.6 **Amendment and Restatement**

This Agreement amends and restates the Original Agreement in its entirety.

ARTICLE 2. OBJECTIVE OF THE AGREEMENT

2.1 The purpose of this Agreement is to set out the principles and processes by which the Parties have agreed to work together to facilitate Electricity generation through three Phases of development, construction, implementation, installation and operation of wind and solar Generation Facilities and to create Manufacturing and jobs in Ontario.

2.2 To the extent that further details or clarifications are required to implement the principles of this Agreement, those details or clarifications shall be negotiated, in good faith, each Party acting reasonably, in the context of the first PPA to be entered into between the Project Company and the OPA as described in Article 9.

ARTICLE 3. — THE PROJECT

3.1 The Korean Consortium will develop the Project in three Phases. In the first Phase, the Korean Consortium will develop, construct, implement, install and operate wind Generation Facilities and solar Generation Facilities in Southern Ontario with Targeted Generation Capacity of 400 MW and 100 MW, respectively, and with a Targeted Commercial Operation Date by March 31, 2014 ("**Phase 1**").

3.2 For the remaining two Phases of the Project, the Korean Consortium will develop construct, implement, install and operate wind Generation Facilities and solar Generation Facilities for each Phase considering major factors affecting the technical and economic viability of such development. The Targeted Commercial Operation Date and Targeted Generation Capacity for each such Phase are as follows:

Phase	Targeted Generation Capacity - Wind (MW)	Targeted Generation Capacity - Solar (MW)	Targeted Commercial Operation Date
Phase 2	400	100	December 31, 2014
Phase 3	200	100	December 31, 2016

3.3 Within 120 days of the execution of this Agreement, the Korean Consortium shall deliver to the Government of Ontario a schedule of activities for Phase 1, including milestones and the proposed start and completion dates for each milestone. Within 120 days after the Parties agree to a site location for any of Phases 2 and 3 through the Working Group, the Korean Consortium shall deliver to the Government of Ontario a schedule of activities for each such Phase, including milestones and the proposed start and completion dates for each milestone. Within 150 days of the execution of this Agreement, the Korean Consortium shall deliver to the Government of Ontario the expected schedule for the establishment of Manufacturing Plants in accordance with Article 8.1 and the estimated job creation relating thereto. Changes to the schedules shall only be made through satisfactory discussions of the Parties.

3.4 The Korean Consortium may adjust the Targeted Generation Capacity for each Phase of the Project specified in Articles 3.1 and 3.2 within the range of plus or minus ten percent (10%) upon reasonable notice to the Government of Ontario, and subject to Article 16.8, the Parties, acting reasonably, may agree to amend the Targeted Generation Capacity for each Phase of the Project within the range of plus or minus twenty percent (20%), in either case based on such factors as technical evaluations, the availability of Transmission System access and design capacity, site location and characteristics, availability of suitable land, availability of necessary equipment, permitting and the then current economic circumstances, subject to Targeted Generation Capacity of 1,369 MW overall for the Project. The Parties acknowledge that the Phase 1 and Phase 2 Capacity in MWs has been adjusted pursuant to this Section from an aggregate of 1,000 MW to an aggregate of 1,069 MW.

ARTICLE 4. PROJECT COMPANIES

4.1 The Korean Consortium may undertake each Phase of the Project through one or more entities (hereinafter individually referred to as a "**Project Company**") and may invite one or more investors, including financial institutions, equipment or material suppliers and/or any other strategic partners, to the Project or a particular Phase of the Project (or part thereof) or to a particular Project Company, provided that Samsung and/or KEPCO shall retain Control of each Project Company until such Project Company enters into a PPA with the OPA and thereafter the provisions in the FIT Contract related to Control and assignment shall apply to the Project Company.

4.2 The Korean Consortium may divide a Phase into one or more smaller Generation Facilities provided that the Korean Consortium provides notice to the Government of Ontario of its intent to do so.

ARTICLE 5. ROLES AND RESPONSIBILITIES OF THE PARTIES

5.1 In carrying out their respective roles and responsibilities hereunder, each of the Parties shall act reasonably and in good faith to advance the Project.

5.2 The Parties will establish a working group (the "**Working Group**"), comprised of eight (8) members, with equal membership from the Korean Consortium and the Government of Ontario, which will meet regularly throughout the term of this Agreement. Each of the Korean Consortium and the Government of Ontario shall

name a Co-chair of the Working Group. The Working Group may be informed by such persons with such expertise as are required by any Party from time to time, including persons affiliated with the Parties' agencies or affiliates. The roles and responsibilities of the Working Group shall include:

(a) Establishing its processes for conducting the business of the Working Group;

(b) Resolving issues that arise in relation to this Agreement. including material changes to the Project and issues that arise with respect to the determination of Jobs and the calculation of the Economic Development Adders.

(c) Recommending suitable sites for Phase 2 and Phase 3 subject to existing transmission capacity or the expected expansion of the Bulk Transmission System where it is determined to be feasible under Applicable Laws and facilitating the resolution of issues relating to transmission capacity and connection access for such sites and the relevant Points of Connection;

(d) Exchanging information relevant to the Project;

(e) Reviewing the tentative schedule prepared by the Korean Consortium for each Phase, and monitoring progress toward Commercial Operation Dates for each Phase by identifying milestones for each Phase and, from time to time, assessing whether such milestones can reasonably be achieved;

(f) Providing a forum for reporting on actions that each Party is undertaking to facilitate the Project;

(g) As further described in Article 6.6, assisting and facilitating the Korean Consortium in securing rights of ways for connection to the Transmission System through participation in a joint committee to work on land owner issues;

(h) Establishing priorities among issues arising from this Agreement;

(i) Negotiating Aboriginal consultation/engagement protocols in accordance with Article 10; and

(j) Subject to Article 15, attempting to resolve disputes between the Parties and escalating disputes in accordance with Article 15 as necessary.

5.3 The Parties acknowledge that each Phase of the Project will require the execution of agreements with various counterparties that are customary for projects of this nature and necessary for the purposes of successful financing of each Phase (collectively the "**Project Agreements**"). Such Project Agreements include:

(a) PPA between the OPA and the Project Company, as applicable;

(b) Lease Agreements and/or other land tenure documents for the Project sites and any connection lines to be constructed by the Project Company;

(c) Interconnection Agreements between Hydro One Networks Inc. or another transmitter or distributor and the Project Company relating to access to the Transmission System; and

(d) Engineering Procurement and Construction Contracts and Operation and Maintenance Contracts.

ARTICLE 6. SITES

6.1 The Korean Consortium undertakes to study and explore potential site locations for each Phase of the Project, having regard to technical evaluations, transmission capacity, social issues and availability of government and private land. The Korean Consortium undertakes to establish plans for securing land required for generation in consultation with private land holders and the Government of Ontario, as appropriate, and in accordance with the Targeted Commercial Operation Date for each Phase of the Project. The Korean Consortium will present plans for securing the land required for each Phase to the Working Group.

6.2 The Korean Consortium's current intention is that the lands for the Phase 1 sites will comprise approximately: (i) 20,000 acres of land under public and private ownership in Haldimand County, Ontario; and (ii) 30,000 acres of land under private ownership in greater Essex County, Chatham-Kent County and the town of Lake Shore, Ontario. The Parties acknowledge that the quantity and location of lands are subject to change as the Korean Consortium completes its due diligence, including assessment of the availability of suitable land. The Korean Consortium will provide evidence of Access Rights, as contemplated by the FIT Rules ("**Access Rights**"), for 80% of the land held by private land holders required for Phase 1 on or before August 31, 2010.

6.3 In respect of Phase 1, subject to the approval of Treasury Board of Cabinet and the Lieutenant Governor in Council granting an order in council for the disposition of land and subject to the Government of Ontario in cooperation with the Korean Consortium satisfying the Duty to Consult, if any, and engaging Aboriginal Communities as set out in the Aboriginal consultation/engagement protocol, if requested to do so by the Korean Consortium, the Government of Ontario, by its agent, the Ontario Infrastructure and Lands Corporation, or its successor in title, will provide or will cause to be provided to the applicable Project Company a long term lease or other interest in the lands within the South Cayuga Land Bank in Haldimand County (with a minimum term tied to the duration of the applicable PPA and renewable for an additional 20 years upon the agreement of the parties) and on standard government terms and conditions for documents of this nature and at market price per acre, having regard to its use, for Ministry of Infrastructure land.

6.4 In respect of Phases 2 and 3, the Government of Ontario commits to work with the Korean Consortium and the Ministry of Natural Resources to secure appropriate Crown land sites for the applicable Project Companies. Long term leases or other interests in Crown land sites as identified by the Working Group will be negotiated on standard government terms with the duration of the interest tied to the applicable PPA (and renewable for an additional 20 years upon the agreement of the parties) and will

be subject to any required internal government approvals and subject to the Government of Ontario in cooperation with the Korean Consortium satisfying the Duty to Consult, if any, and engaging Aboriginal Communities as set out in the Aboriginal consultation/engagement protocol.

6.5 Upon the request of the Korean Consortium, the Government of Ontario undertakes to assist and facilitate the Korean Consortium's use of Class 3 agricultural land located in Haldimand County for a solar Generation Facility not to exceed 100 MW in Phase 1.

6.6 The Government of Ontario agrees to assist and facilitate the Korean Consortium in securing rights of way for connection to the Transmission System through the participation of Ministry of Energy and the Korean Consortium in a joint committee to work with land owners.

ARTICLE 7. UNDERTAKINGS

7.1.1 The Korean Consortium undertakes to or to cause the applicable Project Company to:

(a) Obtain all Project Agreements, necessary permits, licenses and approvals from all relevant authorities, including those related to interconnection to the Transmission or Distribution Systems, as the case may be, for each Phase;

(b) Construct, own and operate the required connection facilities for the wind or solar Generation Facilities, as the case may be, to the Point of Connection to the Bulk Transmission System or Distribution System, for each Phase; and

(c) Use best efforts to specify Points of Connection to the existing Transmission System or specify project locations for the Generation connection for the Generation Facilities for Phase 2 on or before September 30, 2010 and for Phase 3 on or before December 31, 2014, and in all cases demonstrate the necessary Access Rights, for a Generation Facility at least two years prior to the Targeted Commercial Operation Date for the Phase.

7.1.2 The Parties acknowledge that the Korean Consortium specified to the Government of Ontario Points of Connection for all Phase 1 Generation Facilities on or before December 31, 2009 and that the Government of Ontario is relying on the Points of Connection so specified. The Parties may consider changes to the Points of Connection for Phase 1 Generation Facilities only if the transmission capacity required by any change does not exceed the transmission capacity reserved in accordance with Article 7.3(b) and sufficient connection capacity exists at the proposed Point of Connection at the time of the proposed change.

7.2 The Parties may agree to extend the times specified in Article 7.1.1(c) in accordance with Article 16.8.

7.3 The Government of Ontario undertakes to:

(a) Facilitate the Korean Consortium in obtaining necessary regulatory approvals and permits through the Renewable Energy Project Management Branch Office of the Ministry of Energy;

(b) Guarantee priority access to, the Bulk Transmission System capacity allocated under the FIT Program, and availability of connection access to the Bulk Transmission System for Phase 1 by reserving for and allocating to the relevant Project Companies 240 MW of transmission capacity allocated under the FIT Rules in Haldimand County and 260 MW of transmission capacity allocated under the FIT Rules in Essex County, Chatham-Kent County and the town of Lake Shore;

(c) Provide to the applicable Project Company priority access to the Bulk Transmission System capacity allocated under the FIT Program and availability of connection access to the Bulk Transmission System for Phases 2 and 3 or part thereof), inclusive, at the Points of Connection identified and agreed by the Working Group, subject to existing capacity within the Bulk Transmission System or the expected expansion of the Bulk Transmission System where it is determined to be feasible according to Applicable Laws; and

(d) To facilitate and assist the Korean Consortium in obtaining information related to the availability of Bulk Transmission System access and capacity at potential sites.

7.4 The Government of Ontario's undertaking under Article 7.3(c) in respect of availability of priority access to the Bulk Transmission System for Phases 2 and 3 is conditional upon at least one Manufacturing Partner, during the previous Phase, commencing Manufacturing of a Component. By way of an example, if, during Phase 1, a Manufacturing Partner commences to Manufacture towers in the Province of Ontario and a Project Company procures solar inverters in accordance with Article 8.1, the Government of Ontario assures the Korean Consortium of availability of priority access to adequate bulk transmission connectivity/capacity for Phases 2 and 3.

7.5 The Government of Ontario shall use best efforts to require that Hydro One Networks Inc. and the Independent Electricity System Operator use best efforts to deliver in a timely manner the System Impact Assessments and Customer Impact Assessments required for the connection of the Generation Facilities to the Transmission System. The Renewable Energy Facilitation Office, at the request of the Project Company(ies), shall liaise with the Ministry of Environment regarding renewable energy approvals for any of the Generation Facilities and the OEB regarding Leave to Construct approvals for the Generation Facilities.

ARTICLE 8. MANUFACTURING COMMITTMENT

8.1.1 The Korean Consortium will endeavour on a commercially reasonable basis to have its Manufacturing Partners commence commercial operation of the Manufacturing Plants for blades, towers and solar inverters on or before December 31, 2011.

8.1.2 The Korean Consortium will endeavour on a commercially reasonable basis to have its Manufacturing Partner commence commercial operation of the Manufacturing Plant for solar modules and Solar MV Station in London, Ontario on or before December 31, 2013.

8.1.3 The Korean Consortium will provide documentation to the Government of Ontario that all four Manufacturing Plants are providing 900 Jobs at peak capacity on or before December 31, 2013.

8.2 Jobs shall be calculated as follows as the aggregate of (a) and (b):

(a) A Job, x, for hourly employees, in respect of any calendar year, is calculated as

$$x = a/2000$$

where a = the total number of hours worked during each calendar year by all hourly employees, including hours taken as paid vacation, sick leave, and for other similar reasons, and hours for which pay is provided in lieu of notice.

(b) A Job for a salaried employee means a full time job of a salaried employee during one entire calendar year. If a salaried employee is employed for fewer than 12 months over a calendar year, each full month that the employee is actually employed shall be considered to be 1/12th of a Job.

8.3 The Parties acknowledge and agree that the Economic Development Adder payable pursuant to Article 9 is in consideration of the Korean Consortium's attraction of Manufacturing Plants to the Province of Ontario and the Jobs that result therefrom. For greater certainty, bringing Manufacturing Plants to Ontario includes the use of existing facilities for a new purpose.

8.4 To be eligible for the Economic Development Adder as per Article 9.3 and assurance of availability of and priority access to the Bulk Transmission System for Phase 2 and 3 as per Article 7.3(c), the Korean Consortium shall inform the Government of Ontario of its selection of each Manufacturing Partner and provide evidence of its Manufacturing commitment through documentation between the Korean Consortium and the Manufacturing Partner, such as agreements or memoranda, and any other relevant document which substantiates the arrangements between the Korean Consortium and the Manufacturing Partner, the establishment of new facilities for Manufacturing in the Province of Ontario or the use of existing facilities for Manufacturing Components. The Parties acknowledge and agree that the number of employees working at an R&D Center in the Province of Ontario shall be deemed to be Jobs for the purpose of Section 9.3.

8.5 The Korean Consortium estimates that the Manufacturing commitment will create approximately nine hundred (900) jobs in Ontario.

8.6 The Korean Consortium shall immediately notify the Government of Ontario of any material change in the commercial operation of a Manufacturing Plant relating to the Manufacture of a Component in Ontario of which the Korean Consortium becomes aware, including plans to reduce or cease Manufacturing and the effect on the number of jobs created in the Manufacturing Plant. In the event that a Manufacturing Partner ceases operation of a Manufacturing Plant of a Component prior to December 31, 2016, then the Economic Development Adder payable thereafter pursuant to Article 9.3.1 shall be reduced by twenty-five (25%) percent.

8.7 The Government of Ontario agrees that it shall not provide, or permit to be provided by its agencies, to any other renewable energy project or developer the benefit of an economic development adder or similar incentive which is greater than the Economic Development Adder unless the developer has entered into an agreement with the Government of Ontario or one of its agencies with a value and scope comparable to or greater than that provided for in this Agreement. For greater certainty, this does not include the Community Price Adder or Aboriginal Price Adder contemplated by the FIT Rules.

8.8 The Korean Consortium shall receive exclusive benefit and credit through the Economic Development Adder for the Manufacturing Partners and their respective facilities in Ontario, provided, however, that any developer may procure items from Manufacturing Partners for the purposes of meeting Domestic Content requirements. The Government of Ontario will not directly or indirectly provide any benefit, credit (save that pertaining to Domestic Content in respect of a FIT Contract of an applicant under the FIT Rules) or incentive to other renewable energy projects or developers in connection with the Manufacturing Partners, provided that the Korean Consortium identifies its Manufacturing Partners to the Government of Ontario and provides evidence satisfactory to the Government of Ontario, acting reasonably, that the Manufacturing Partners are working or are in association with the Korean Consortium in accordance with the procedures established by the Working Group.

8.9 Notwithstanding that the Economic Development Adder is payable to the Korean Consortium for Manufacturing, the Parties acknowledge and agree that the Government of Ontario is not a party to any agreements, relationships or negotiations between the Korean Consortium and any of its Manufacturing Partners, except where the Government of Ontario has entered into an agreement with a Manufacturing Partner as part of a program of the Government of Ontario to provide incentives, a grant or the like. The Korean Consortium shall hold harmless the Government of Ontario, its ministers, appointees, officers, employees and agents (a "**Protected Person**") for legal fees and settlement amounts (incurred with written consent of the Korean Consortium) and other expenses reasonably incurred by the Protected Person which a Protected Person suffers or incurs as a result of any and all suits, actions, claims, demands or proceedings made, brought or threatened against a Protected Person by a Manufacturing Partner (a "**Claim**") which are attributable to or in connection with the agreement or arrangement of either the Korean Consortium (or

any of KEPCO, Samsung or their affiliates) or a Project Company with a Manufacturing Partner and related to the Korean Consortium's manufacturing commitment under this Agreement, except where the Protected Person is held liable by a court or competent authority or the Protected Person settles such Claim without prior written consent of the Korean Consortium or to the extent that such Claim is attributable to or in connection with an incentive or other program provided by the Government of Ontario to a Manufacturing Partner.

ARTICLE 9. POWER PURCHASE AGREEMENT

9.1 The Parties agree that the payment for Hourly Delivered Electricity generated by each Phase of the Project shall be effected through one or more PPAs between Project Companies and the OPA. Promptly following the execution of this Agreement, the Government of Ontario will instruct the OPA to commence negotiating the form of PPA for Phase 3 projects with the Korean Consortium. If a Project Company submits to the OPA: (i) connection details with respect to mutually agreed Point(s) of Connection; (ii) evidence of necessary Access Rights as specified in the FIT Rules for a Phase (or part thereof) satisfactory to the OPA; (iii) an application package which has been determined by the OPA to be complete in accordance with the OPA's standard application package requirements for the FIT Program and; (iv) a draft form of PPA which is in accordance with the requirements set out in this Article 9.1, and it so advises the Government of Ontario and the OPA, the Government of Ontario shall cause OPA to be directed to enter into a PPA with the Project Company for the procurement of the Electricity supply and capacity contemplated by such Phase (or part thereof). The directive will require the OPA to deliver, within sixty (60) days of such conditions precedent being fulfilled, an executed PPA substantially in the form of the most recent version of the FIT Contract and FIT Rules in use by the OPA at such time that the OPA executes and delivers the PPA, with only such amendments as are required to give effect to the Economic Development Adder, to ensure compliance with the municipal council support resolution requirements set out in Section 9.2 hereof and which contains only such additional changes as are required to address the Korean Consortium's commitments under this Agreement. If, however, the OPA has not signed and delivered such PPA within such sixty (60) day period and the Korean Consortium has fulfilled the conditions precedent set out above to the satisfaction of the OPA, then for each day that the OPA delays in signing and delivering such PPA after such sixty (60) day period, the Milestone Date for Commercial Operation under that PPA (that is, the Targeted Commercial Operation Date of Phase 3, being December 31, 2016) will be extended by one day. For greater certainty, subject to any new versions or material changes to the FIT Program being introduced before the Project Company has fulfilled such conditions precedent and/or before the OPA has executed and delivered a signed PPA as contemplated above, it is intended that, for Phase 3, version 2.1.1 of the FIT Contract and FIT Rules will apply for the purpose of the Project Company's application and for the purpose of the form of PPA. Each such PPA will provide that the price payable by the OPA for the Electricity supply and capacity subject to such agreement will be the aggregate of,

(a) for wind, the price as specified in the then current Price Schedule; provided that for Phase 3 wind, the price will be the greater of: (i) 10.5 cents per kWh; and (ii) the price as specified in the then current Price Schedule; and

(b) for solar, the price as specified in the then current Price Schedule; provided that for Phase 3 solar, the price will be the greater of: (i) 29.5 cents per kWh; and (ii) the price as specified in the then current Price Schedule.

(the "**base prices**") plus the Economic Development Adder, as applicable, and any other adder to which the Project Company would be entitled had it made application for a FIT Contract pursuant to the FIT Rules. Each such PPA will constitute a "Procurement Contract" for the purposes of the *Electricity Act, 1998*. Upon execution of a PPA, the rights and obligations of the Parties with respect to the Phase (or part thereof where the Phase has been subdivided) shall be governed exclusively by that PPA.

9.2 The Korean Consortium recognizes and acknowledges that among various commitments and obligations of the FIT Contract, the Korean Consortium or the Project Company shall be required to: (a) achieve Domestic Content requirements as required by the FIT Rules and, in particular, PPAs for Phase 3 will include Domestic Content requirements contained in the FIT 2.0 program as of May 1, 2013; (b) for Phase 3, obtain municipal council support resolutions from each municipal council in which a generating facility which is the subject of a PPA has lands situated in, as required by the FIT Rules, as an additional condition to obtaining Notice to Proceed under such PPA.

For greater certainty, if, as a result of obtaining municipal council support resolutions from the City of Kingston and/or Loyalist Township for the Phase 2 Kingston Solar Project or upon a failure to obtain one or both of such municipal council support resolutions, the number of MW for such project is reduced such that it is less than 100 MW, the reduced MW will be forfeited and the aggregate MW for the Project shall be reduced by such amount (for example, if as a result of the foregoing, the MW for the Phase 2 Kingston Solar Project is reduced from 100 MW to 50MW, then the aggregate MW for the Project (Phases 1, 2 and 3) shall be reduced from 1,319 MW to 1,359 MW).

If a Phase 3 PPA is terminated by the OPA pursuant to Section 2.4 of such PPA, priority access would be re-granted to the Korean Consortium for no more than the same number of MW and for the same generation source (wind or solar PV) contemplated by that PPA, conditional upon the Korean Consortium committing to at least the same proportionate number of Jobs originally attributable to such MW, taking into account any change in PPA milestones arising from new PPAs.

9.3 **Economic Development Adders**

9.3.1 Subject to reduction as provided herein, the Economic Development Adder for Phases 1 and 2 shall be 0.27 cents per kWh for wind generation and 1.43 cents per kWh for solar generation, payable over twenty (20) years through PPAs for Phases 1 and 2, payment commencing upon the Commercial Operation Date of the applicable

Generation Facility. In no event shall the total of the Economic Development Adder for Phases 1 and 2 exceed $110 million net present value.

9.3.2 (a) Within 60 days after December 31, 2013, December 31, 2014 and December 31, 2015, the Korean Consortium shall provide evidence of the Jobs at the Manufacturing Plants over the previous twelve months. For greater certainty, measurement of Jobs will be on an aggregate basis, without regard to the number of Jobs per Manufacturing Plant. Such evidence may include but is not limited to payroll records; Canada Revenue Agency remittances; lists of employees by position, hire date and termination date (if applicable) and hours worked ("**Jobs Documentation**").

(b) Upon receipt of the Jobs Documentation, the Government of Ontario shall review same in a timely manner. The Government of Ontario may request that the Korean Consortium provide additional information or explanation with respect to such documentation. The Korean Consortium shall respond to such requests for information or explanation in a reasonably detailed and timely manner.

9.3.3 (a) If the average Jobs between January 1, 2013 and December 31, 2013 is less than eighty five (85) percent of nine hundred (900) Jobs, then the Economic Development Adder will be reduced for Phase 1 PPAs on a *pro rata* basis.

(b) If the average Jobs between January 1, 2013 and December 31, 2014 is less than eighty five (85) percent of nine hundred (900) Jobs, then the Economic Development Adder will be reduced for Phase 1 and Phase 2 PPAs on a *pro rata* basis. If the average Jobs between January 1, 2013 and December 31, 2014 is equal to or greater than eighty five (85) percent of nine hundred (900) Jobs, then the Economic Development Adder will be adjusted for Phase 1 PPAs and applied to Phase 2 PPAs.

(c) If the average Jobs between January 1, 2013 and December 31, 2015 is less than eighty five (85) percent of nine hundred (900) Jobs, then the Economic Development Adder will be reduced for Phase 1 and Phase 2 PPAs on a *pro rata* basis. If the average Jobs between January 1, 2013 and December 31, 2015 is equal to or greater than eighty five (85) percent of nine hundred (900) Jobs, then the Economic Development Adder will be adjusted for Phase 1 and Phase 2 PPAs.

(d) By way of example, if the average Jobs in a period described in (a), (b) or (c) is equal to or greater than eighty five (85) percent of nine hundred (900) Jobs, then the Economic Development Adder would be the amounts in Article 9.3.1 for wind generation and for solar generation respectively. If the average Jobs in a period described in (a), (b) or (c) is fifteen (15) percent below eighty five (85) percent of nine hundred (900) Jobs, then the Economic Development Adder for wind generation and solar generation would be reduced by fifteen (15) percent.

9.3.4 Subject to reduction as provided herein, the Economic Development Adder for Phase 3 solar shall be 1.43 cents per kWh, payable over twenty (20) years through PPAs for Phase 3 solar, payment commencing upon the Commercial Operation Date of the applicable Generation Facility.

9.3.5 (a) Within 60 days after December 31, 2016, the Korean Consortium shall provide evidence of the Jobs at (i) the Manufacturing Plants producing Solar Components and (ii) the R&D Center for and in relation to Solar Components over the previous twelve months. For greater certainty, measurement of Jobs will be on an aggregate basis, without regard to the number of Jobs per Manufacturing Plant. Such evidence may include but is not limited to Jobs Documentation.

(b) Upon receipt of the Jobs Documentation, the Government of Ontario shall review same in a timely manner. The Government of Ontario may request that the Korean Consortium provide additional information or explanation with respect to such documentation. The Korean Consortium shall respond to such requests for information or explanation in a reasonably detailed and timely manner.

9.3.6 (a) If the average Jobs specified in Article 9.3.5(a) between January 1, 2016 and December 31, 2016 is less than eighty five (85) percent of three hundred (300) Jobs, then the Economic Development Adder will be reduced for Phase 3 solar PPAs on a *pro rata* basis.

(b) By way of example, if the average Jobs in the period described in (a) is equal to or greater than eighty five (85) percent of three hundred (300) Jobs, then the Economic Development Adder would be the amount in Article 9.3.4. If the average Jobs in the period described in (a) is fifteen (15) percent below eighty five (85) percent of three hundred (300) Jobs, then the Economic Development Adder for Phase 3 solar generation would be reduced by fifteen (15) percent.

9.3.7 (a) When the Government of Ontario is satisfied with the documentation provided pursuant to Article 9.3.2(a), the Government of Ontario and the Korean Consortium have agreed on the calculation of average Jobs and the amount of the Economic Development Adder, as applicable, the Korean Consortium may prepare and provide to the Government of Ontario a draft Joint Instruction to the OPA. Upon receipt of the draft Joint Instruction, the Government of Ontario shall review the draft Joint Instruction and provide the Korean Consortium with any comments that it has on the form of draft Joint Instruction in a timely manner.

(b) At such time as the form of the draft Joint Instruction has been settled, the Parties shall, as soon as practicable, execute and deliver the Joint Instruction to the OPA in the form approved by the Parties. A Joint Instruction shall be effective on the date that it is executed by the last Party to execute it.

(c) If at any time any Party is of the view that a change to a Joint Instruction is necessary for any reason, that Party shall provide the other Parties with a revised draft Joint Instruction and the provisions of (a) and (b) shall apply *mutatis mutandis*.

(d) Any dispute as to the calculation of average Jobs, the amount of the Economic Development Adder or the form of draft Joint Instruction shall be brought to the Working Group for resolution in a timely manner and, if no resolution is reached at the Working Group, resolved in accordance with Article 15.

9.4 The Government of Ontario or the OPA may take such steps as are reasonable in the circumstances, including inspection of documentation and visits to manufacturing and Generation Facilities, and the Korean Consortium shall reasonably assist with such steps, including the provision of documentation and facilitation of visits, to verify the requirements of Article 9.3.

9.5 Articles 8.6, 9.3 and 9.4 and Schedule A shall survive until the termination or expiration of the last PPA entered into in connection with Phases 1 and 2 and Phase 3 solar, notwithstanding any termination or expiration of this Agreement.

ARTICLE 10. ABORIGINAL COMMUNITIES

10.1 The Parties agree that they will carry out all appropriate steps and provide all necessary mutual assistance to ensure that the Duty to Consult obligations, if any, regarding the Project or activities related to it are met and that Aboriginal Communities are engaged as necessary. The Parties agree to negotiate in good faith, each acting reasonably, and to enter into one or more Aboriginal consultation/engagement protocols that shall address the respective roles of the Parties, including costs, with respect to the consultation/engagement.

10.2 The Korean Consortium will assess its interests pertaining to Aboriginal communities and,

(a) Consider engaging a consultant based in Canada and expert in local Aboriginal matters to advise on all Phases, including Phase 1;

(b) Consider opportunities for equity participation by Aboriginal communities in each Phase of the Project; and

(c) Where possible, consider employing qualified members of Aboriginal communities in each Phase,

provided that the provisions of paragraphs (b) and (c) above do not create an obligation to include Aboriginal communities in any Phase of the Project as equity participants or to hire members of Aboriginal communities.

10.3 The Korean Consortium shall consider opportunities that would allow it to qualify for an Aboriginal Price Adder under the FIT Rules.

10.4 In the event that the Korean Consortium is unable, after making reasonable efforts, to reach an agreement with Six Nations elected council about its Phase 1 project in Haldimand County, Ontario by July 31, 2012, then the Minister shall direct the OPA to allow the Korean Consortium or relevant Project Company, as the case may be, to terminate any PPA for Phase 1 wind and/or solar projects in Haldimand County without liability to any of the OPA or the Korean Consortium or Project Company, as the case may be, and coincidentally to enter into PPAs for wind and solar projects of similar Capacity at sites and with Points of Connection satisfactory to each of the Korean Consortium, the OPA and the Government of Ontario, each acting reasonably, together with Milestone Dates of Commercial Operation no more than 32 months from the date of such PPAs.

ARTICLE 11. CONDITIONS

11.1 The obligations of the Parties in connection with each Phase or part thereof shall be subject to and conditional upon the satisfaction of the following conditions in respect of each Phase or part thereof, each of which is acknowledged to benefit each of the Parties:

(a) The Korean Consortium has completed the feasibility study for the Phase or part thereof and the results of the feasibility study are to its satisfaction and the satisfaction of its proposed investors and lenders;

(b) The Project Agreements relating to such Phase or part thereof have been entered into;

(c) Each of KEPCO, Samsung and the Project Company, as applicable, duly obtains all necessary regulatory, corporate and internal approvals for the implementation of the Phase or part thereof;

(d) The necessary financing for each Phase or part thereof is successfully arranged and committed on terms and conditions acceptable to each of KEPCO and Samsung; and

(e) Korean Consortium to use best efforts to specify Points of Connection to the existing Transmission System or specify project locations for the generation connection for the Generation Facilities for Phase 2 on or before September 30, 2010 and for Phase 3 on or before December 31, 2014, and for Phases 2 and 3 demonstrate the necessary Access Rights, including Points of Connection, for a Generation Facility at least two (2) years prior to the Targeted Commercial Operation Date for the Phase.

ARTICLE 12. COVENANTS, REPRESENTATIONS AND WARRANTIES

12.1 Each of Samsung and KEPCO represent and warrant in respect of itself that:

(a) It is a corporation organized, existing and in good standing under the laws of the Republic of Korea with power and capacity to act in the Province of Ontario;

(b) It has good and sufficient power, authority and right to execute and deliver this Agreement and to perform its obligations hereunder;

(c) This Agreement has been duly authorized, executed and delivered by it and is a valid and legally binding obligation of Samsung or KEPCO, as the case may be, and is enforceable in accordance with its terms;

(d) All obligations of the Korean Consortium constitute valid and binding obligations of both KEPCO and Samsung;

(e) Neither Samsung nor KEPCO is in default in any material respect in connection with any requirement to: (i) file Canadian federal, provincial, municipal tax returns; or (ii) pay or withhold Canadian federal, provincial, municipal taxes or assessments (including interest or penalties with respect thereto and including installments due in respect of its current taxation year but not including taxes which are being contested in good faith in accordance with Applicable Laws) which are due and payable or required to be withheld, as the case may be, in each case, in respect of its income, business or property; and

(f) Except as disclosed in writing to the Government of Ontario, to the best of Samsung and KEPCO's knowledge and belief, there are (i) no criminal charges pending against Samsung or KEPCO and (ii) no actions, suits, or proceedings pending against or affecting Samsung or KEPCO, in either case which might materially affect the ability of Samsung or KEPCO to perform and satisfy all covenants and obligations which they are to perform or are responsible for having performed under this Agreement.

12.2 Samsung and KEPCO covenant that the business of the Korean Consortium in respect of the Project will be conducted in a proper and efficient manner so as to protect their property and assets and in substantial compliance with all Applicable Laws and Samsung, as leading member, will represent the Korean Consortium.

12.3 The Government of Ontario represents and warrants that:

(a) It has good and sufficient power and authority to enter into this Agreement; and

(b) This Agreement has been duly authorized, executed and delivered by the Government of Ontario and is a valid and legally binding obligation of the Government of Ontario enforceable against the Government of Ontario in accordance with its terms, subject to the *Financial Administration Act*, the availability of equitable remedies against the Crown, the *Proceedings Against the Crown Act* and the limitations with respect to the enforcement of remedies against sovereign entities and their agencies, including the qualification that a court of Ontario may not grant an injunction against the Government of Ontario, make an order for specific performance, make an order for recovery or delivery of real or personal property or issue execution or attachment or process in the nature thereof other than garnishment in limited circumstances.

12.4 Each of KEPCO, Samsung and the Government of Ontario covenant that each will perform and satisfy all covenants and obligations to be performed by it under this Agreement.

12.5 Each of the Parties acknowledges that the other Parties are relying on its representations and warranties herein contained in entering into and performing their obligations under this Agreement.

ARTICLE 13. PROJECT DEVELOPMENT COST AND EXPENSES

13.1 Each Party shall bear its own costs and expenses incurred by such Party, including but not limited to, travel expenses and accommodation costs, and legal and advisory costs and expenses, for the purpose of or in connection with the performance of its obligations under this Agreement.

ARTICLE 14. EFFECTIVENESS AND TERMINATION

14.1 This Agreement shall become effective as of the date of its execution and shall remain in full force and effect until the earlier of: (a) the Commercial Operation Date of the last of the three Phases of the Project to be completed; and (b) December 31, 2017, unless earlier terminated pursuant to Article 14.2 or extended by mutual agreement in writing by the Parties.

14.2 **Termination of the Agreement**

(a) The Parties may terminate this Agreement at any time by agreement in writing, upon such terms and conditions as the Parties may agree.

(b) The Korean Consortium may terminate this Agreement as it relates to a particular Phase within sixty (60) days after the completion of a feasibility study for that Phase upon thirty (30) days' notice to the Government of Ontario if the Korean Consortium determines at its sole discretion that the result of such feasibility study is not satisfactory.

(c) Either of the Government of Ontario or the Korean Consortium may terminate this Agreement upon thirty (30) days' notice to the other party if the conditions listed in Articles 11.1(a), (b), (c) and (d), in respect of Phase 3 or part thereof are not satisfied with respect to that Phase or waived on or before six (6) months prior to the Targeted Commercial Operation Date for that Phase or if the conditions listed in Article 11.1(e) in respect of Phase 3 or part thereof are not satisfied with respect to that Phase or waived on or before twenty-four (24) months prior to the Targeted Commercial Operation Date for that Phase.

(d) The Government of Ontario may terminate this Agreement immediately upon notice to the Korean Consortium in the event that either Samsung or KEPCO proposes a compromise or arrangement to its creditors generally, has any petition for in bankruptcy filed against it unless the same is discharged or dismissed within thirty (30) days, has taken or consented to any proceeding to

have itself declared bankrupt or wound-up or to have a receiver appointed over a substantial portion of its property.

14.3 **Consequences of Termination**

(a) Notwithstanding any termination of this Agreement pursuant to Article 14, all of the provisions of this Agreement that expressly or by their nature survive the expiry or termination of this Agreement (including Articles 8.6, 9.5, 14, 15, 16.1 and 16.3) shall survive despite expiry or termination until they are satisfied or by their nature expire.

(b) Subject in any event to Article 14.3(a), no Party will have any liability to, or claim against, any of the other Parties if this Agreement is terminated pursuant to Article 14.2.

ARTICLE 15. GOVERNING LAW; DISPUTE RESOLUTION

15.1 This Agreement shall be governed by and construed in accordance with the laws of Ontario and the laws of Canada applicable therein and subject to the dispute resolution and arbitration provisions specified in this Article, the Parties agree to the exclusive jurisdiction of the courts of Ontario for the settlement of any disputes arising out of or in connection with this Agreement.

15.2 The Government of Ontario and the Korean Consortium shall, in good faith, use their reasonable efforts to co-operate and work together to preserve the intentions and mutual benefits contemplated by this Agreement, and to ensure the effective and efficient performance of this Agreement's terms and conditions.

15.3 Any dispute, controversy or claim between the Government of Ontario and the Korean Consortium relating to this Agreement or the matters contemplated hereunder (each a "**Dispute**") shall be resolved in accordance with the provisions of this Article 15.

15.4 All Disputes shall initially be referred by any Party to the other Parties for review, consideration and amicable resolution. Such referrals shall be made to the members of the Working Group. Such referrals shall include reasonable information that is accurate, sufficiently detailed, complete and current concerning the Dispute. If the Working Group is unable to resolve the Dispute within ten (10) Business Days after referral of the Dispute to it, the Working Group shall then submit the Dispute, including all related information to the senior executives of the Parties for resolution.

15.5 In the event that a Dispute cannot be resolved pursuant to Article 15.4, the Dispute shall be referred by the senior executives to each of an Executive Vice President of Samsung and/or Executive Vice President of KEPCO as specified by the Korean Consortium and the Minister, for their review, consideration and resolution. Such referral shall include an executive summary of each Party's assessment of the Dispute and the differences between the Parties that have prevented the resolution of the Dispute to that stage of the proceedings. If such individuals are unable to resolve the Dispute within ten (10) Business Days after referral of the Dispute to them, either Party, in its sole and unfettered discretion, shall then have the right to proceed to

arbitration of the Dispute pursuant to Article 15.6. No party shall have the right to proceed to arbitration until it has complied with all steps in the process set out in this Article.

15.6 In the event that either Party submits the Dispute to binding arbitration, the arbitration shall be before one (1) arbitrator ("**Designated Arbitrator**") in Toronto, Ontario pursuant to the *Arbitration Act, 1991* (Ontario), subject to a dispute resolution protocol to be negotiated by the Parties.

ARTICLE 16. MISCELLANEOUS

16.1 Confidentiality

The Parties acknowledge and agree that any information provided by any Party pursuant to or in connection with this Agreement, including all documents and correspondence relating to the negotiation of this Agreement, (collectively, the "**Confidential Information**") was or is to be supplied in confidence. The Parties agree that the disclosure of the Confidential Information could reasonably be expected to result in undue loss to one or all of the Parties. Accordingly, except as may be required by Applicable Laws or the rules of any stock exchange where a Party's shares are circulated or listed, or an order from a government agency or authority or to enforce its rights hereunder, all such Confidential Information provided by any Party hereto pursuant to or in connection with this Agreement shall be kept confidential by the Parties and only used as necessary for the purposes of this Agreement and shall only be made available to a Party's representatives, employees, advisors, consultants, investors or lenders (and in the case of the Government of Ontario, its energy agencies including the OPA, and in case of the Korean Consortium, subsidiaries of Samsung and KEPCO, Manufacturing Partners including prospective Manufacturing Partners, and investors and prospective investors in the Project Company) as are required to have access to the Confidential Information in order to perform the Party's obligations and exercise the Party's rights under this Agreement. Any Party's representatives, employees, advisors, consultants, investors or lenders receiving Confidential Information shall be similarly bound by these provisions. Prior to disclosing any Confidential Information to its representatives, employees, advisors, consultants, investors or lenders, a Party shall take reasonable precautions to ensure that such recipients of Confidential Information are bound by confidentiality obligations substantially similar to those set out in this Article. Each of the Parties receiving Confidential Information agrees to promptly advise the Party that has disclosed such Confidential Information in the event that a recipient of Confidential Information receives a request to disclose such Confidential Information, whether pursuant to this Agreement or otherwise.

16.2 Public Announcement

Except as required by law, Samsung and KEPCO shall not make any public announcement, communication, statement or disclosure with regard to this Agreement, including its execution, except as agreed to by the Government of Ontario. The Parties shall develop and agree to a process for joint communications and public

announcement strategies whereby the Parties will agree to consult, share drafts and co-ordinate with each other in advance of any such event. The Parties hereto consent and agree to the public release of this Agreement at the earliest opportunity.

16.3 **Notice**

Unless otherwise expressly provided herein, all notices and communications required or permitted to be given under this Agreement by each Party shall be made by (a) facsimile, with the original document and the facsimile transmission confirmation to be delivered to the receiving Party by courier within five (5) business days from such transmission; or (b) courier, to the Party addressed as follows:

To Government of Ontario
Hearst Block, 4th Floor, 900 Bay Street, Toronto, Ontario, Canada, M7A 2E1
Attention: Assistant Deputy Minister, Renewables and Energy Efficiency Division
Telephone No.: 416-327-5555
Facsimile No.: 416-325-3438

To KEPCO
502, Yeongdongdaero, Gangnam-Gu, Seoul, Korea
Attention: Jong-Hwa Kim
Telephone No.: 82-2-3456--5503
Facsimile No.: 82-2-3456-5590

To Samsung
Samsung C&T Corporation Bldg., 1321- 20, Seocho 2-Dong,
Seocho-Gu, Seoul 137-857, Korea
Attention: Cho, Sunggi
Telephone No.: 82-2-2145-3076
Facsimile No.: 82-2-2023-3306

or to such other street address, individual or facsimile number as may be designated by notice given by one Party to the others. Any notice or communications if given by (i) personal delivery will be conclusively deemed to have been given on the day of actual delivery thereof; and (ii) facsimile, will be conclusively deemed to have been given on the day of transmittal if given during normal business hours of the recipient and on the business day during which such normal business hours next occur if not given during normal business hours on any day provided the copy thereof is delivered as provided above.

16.4 **Successors and Assigns**

This Agreement shall be binding upon and enure to the benefit of the Parties and their respective successors and permitted assigns. None of the Korean Consortium, KEPCO or Samsung shall assign or otherwise transfer any of its rights or obligations under this Agreement to a third party without the prior written consent of the Government of Ontario. The Government of Ontario may assign this Agreement to any ministry of the Government of Ontario, the OPA or any agent of Her Majesty the

Queen in Right of Ontario at any time upon the delivery of written Notice to the Korean Consortium and without consent of the Korean Consortium. The Government of Ontario shall not otherwise assign, transfer or convey any interest in this Agreement without the prior written consent of the Korean Consortium.

16.5 **Severability**

If any provision of this Agreement is held invalid, illegal or unenforceable for any reason by any court of competent jurisdiction, that provision will be severed from this Agreement and all of the remaining terms and provisions of this Agreement shall nevertheless remain in full force and effect. Upon such determination that any term or other provision is invalid, illegal or incapable of being enforced, the Parties shall negotiate in good faith to modify this Agreement so as to effect the original intent of the Parties, as contained herein, as closely as possible.

16.6 **Entire Agreement**

This Agreement constitutes the entire agreement between the Parties with respect to the subject matter hereof and cancels and supersedes any prior understandings and agreements between the Parties with respect hereto. There are no representations, warranties, terms, conditions, undertakings or collateral agreements, express, implied or statutory, between the Parties other than as expressly set forth in this Agreement.

16.7 **Independent Parties**

Samsung and KEPCO acknowledge that neither is an agent, joint venturer, partner or employee of the Government of Ontario and that they shall not take any actions that could establish or imply such a relationship.

16.8 **Amendment**

The Agreement may only be amended by a prior written agreement duly executed by the Parties. At the request of either Party, the Parties will negotiate in good faith such amendments to this Agreement in order to foster the success of the Project for matters that were not capable of being foreseen at the time of the execution of the Green Energy Investment Agreement, including those related to schedule, capacity, location and generation mix of solar and wind of the Phases, or parts thereof, where such Party has determined, acting reasonably, that same are required to reflect such factors including economic viability, the results of a feasibility study, the investor's requests or financing terms.

16.9 **FIPPA**

Samsung and KEPCO acknowledge that the Government of Ontario is bound by FIPPA and as such that any information provided to the Government of Ontario in connection with the Project or otherwise in connection with this Agreement may be required to be disclosed in accordance with FIPPA. In the event the Government of Ontario is requested to disclose, and the Government of Ontario is planning to disclose, to others pursuant to FIPPA any Confidential Information disclosed by the

Korean Consortium, or either of such Parties, to the Government of Ontario, the Government of Ontario will promptly advise the Korean Consortium of such request so that such Party will have the opportunity to make detailed representations to the appropriate authority about the nature of the information.

16.10 **Future Business in the Province of Ontario**

The Government of Ontario is willing to review business proposals put forward by the Korean Consortium, but such review by the Government of Ontario shall not obligate the Government of Ontario to accept any future proposal, in whole or in part.

16.11 **Time of the Essence**

In the performance and observance of the terms and conditions of this Agreement, time shall be of the essence.

16.12 **Further Assurances**

Each Party will at any time and from time to time, upon the request of another Party, execute and deliver on a timely basis such further documents and do such further acts and things as the other Party may reasonably request in order to evidence, carry out and give full effect to the terms, conditions, intent and meaning of this Agreement.

16.13 **Waiver**

If a Party fails to comply with any term of the Agreement, that Party may only rely on a waiver of the other Party if the other Party has provided a written waiver in accordance with the notice provisions in Article 16.3. Any waiver must refer to a specific failure to comply and shall not have the effect of waiving any subsequent failures to comply.

16.14 **Counterparts**

This Agreement may be executed in one or more counterparts each of which when so executed shall be deemed to be an original and such counterparts together shall constitute but one and the same instrument.

(intentionally left blank)

IN WITNESS WHEREOF, the Parties hereby execute this Agreement by the signatures of their authorized representatives as of the date first above written.

HER MAJESTY THE QUEEN IN RIGHT OF ONTARIO
as represented by the Minister of Energy

Name: Robert Chiarelli
Title: Minister of Energy

KOREA ELECTRIC POWER CORPORATION

Name: Shin Kim
Title: Attorney-in-fact

SAMSUNG C&T CORPORATION

Name: Shin Kim
Title: President and CEO

IN WITNESS WHEREOF, the Parties hereby execute this Agreement by the signatures of their authorized representatives as of the date first above written.

HER MAJESTY THE QUEEN IN RIGHT OF ONTARIO
as represented by the Minister of Energy

Name: Robert Chiarelli
Title: Minister of Energy

KOREA ELECTRIC POWER CORPORATION

Name: Shin Kim
Title: Attorney-in-fact

SAMSUNG C&T CORPORATION

Name: Shin Kim
Title: President and CEO

SCHEDULE A

FORM OF JOINT INSTRUCTION

TO: Ontario Power Authority

DATE: •, 20•

RE: Amended and Restated Green Energy Investment Agreement by and among Her Majesty the Queen in Right of Ontario as represented by the Minister of Energy, Korea Electric Power Corporation and Samsung C&T Corporation dated June 20, 2013 (the "**GEIA**")

PROJECT COMPANY: _____

PROJECT NAME: _____

PROJECT SIZE: _____

DETAILS OF GENERATION FACILITY: _____

POWER PURCHASE AGREEMENT between OPA and the Project Company (If previously signed) _____

You are hereby directed that with effect from [insert date] [the commercial operation of the Project] the Economic Development Adder, as defined in the GEIA, for the PPA related to the Generation Facility is • cents per kWh. Such amount shall apply until you receive a replacement Joint Instruction from the Parties hereto in respect of the Generation Facility in which case, the Economic Development Adder shall thereafter be as set forth therein until again changed.

Unless the context requires otherwise terms defined in the GEIA and used herein shall have the respective meanings ascribed to such terms in the GEIA.

DATED this ___ day of _____. 20 ___

HER MAJESTY THE QUEEN IN RIGHT OF ONTARIO, as represented by the Minister of Energy

By: _____

Name:
Title:

KOREA ELECTRIC POWER CORPORATION

By: _____

Name:
Title:

SAMSUNG C&T CORPORATION

By: _____

Name:
Title:

IMPACT ON RATE-REGULATED TRANSMITTER

The Applicant and Hydro One Networks Inc. ("**Hydro One**") entered into a Customer Connection Engineering Agreement ("**CCEA**") in December 2015. The Applicant expects to receive a draft Generator Customer Connection and Cost Recovery Agreement ("**CCRA**") from Hydro One in early 2016 and expects this to be finalized on or about April 2016. Pursuant to the CCEA, Hydro One determines the protection and controls work required for connection of the Wind Farm, and the CCRA will allocate Applicant's responsibility for the costs of certain protection and controls work that needs to be undertaken in support of the interconnection. No Network reinforcement work is contemplated on Hydro One's system and the Applicant does not expect that the CCRA will contemplate any work by Hydro One that is not fully chargeable to the Applicant. As such, neither the Wind Farm nor the Transmission Project will affect the Uniform Transmission Rate.

ROUTE AND PHYSICAL DESIGN

This Exhibit provides a detailed description of the Transmission Line route, as well as the location and physical design of the Transmission Project. In addition, to provide context, this Exhibit briefly describes the location and physical design of the Wind Farm and its collection system, as well as the Hydro One transmission system to which the Transmission Project will be connected.

i. The Wind Farm and Collector System

The Wind Farm will be located in the Town of Lakeshore in the County of Essex, Ontario on public and private lands south of the community of Belle River. Its location was established based on interest expressed by local landowners, the availability of wind resources and availability of existing infrastructure for connection to the electrical grid.

The Wind Farm will be comprised of approximately forty-one (41) Wind Turbine Generators ("**WTGs**"). The maximum generation capacity of some of the WTGs will be permanently de-rated based on noise compliance requirements so that the total project output will not exceed 100 MW. The WTGs will connect to the Joe Byrne Substation via four 34.5 kV collectors.

A map that illustrates the location of the Wind Farm is at Exhibit C, Tab 2, Schedule 1(i).

ii. The Joe Byrne Substation

The 230 kV/34.5 kV Joe Byrne Substation will be located on private property on Lakeshore Road 125 just north of Byrnedale Road in the Town of Lakeshore in the County of Essex, Ontario. Its location is illustrated by the map at Exhibit C, Tab 2, Schedule 1(ii).

The Joe Byrne Substation will consist of the main 34.5 kV switchgear B1 bus and a main transformer rated 66/88/110 MVA, 240/34.5 kV with an under load tap changer.

A single line diagram of the Joe Byrne Substation is at Exhibit C, Tab 3, Schedule 1(ii). An illustration of the layout of the Joe Byrne Substation is at Exhibit C, Tab3, Tab 1(v).

iii. The Transmission Line

Components

From the 230 kV Joe Byrne Substation, a three phase single circuit 230 kV overhead transmission line, approximately 7 km in length, will connect to the 230 kV Brody Switching Station. Approximately 35 self-supporting steel pole structures with average spans of 160-180 m will be installed on private land and Municipal road allowance to carry the Transmission Line conductors and aluminum clad steel shield wire with optical fibers. All the steel poles will be galvanized and will have concrete foundations.

The Transmission Line will be a three phase single circuit line with 795 or 954 MCM ACSR conductors and OPGW installed on top of the conductor. The transmission line structure heights will range from 29 m to 33.5 m above existing grade. The lowest conductors will maintain minimum of 7 m above existing ground and roadways.

The horizontal and vertical clearance of the Transmission Line from ground will be as per CSA C22.3 1-06 Standard. Along the proposed route, the Transmission Line will require approximately 8-10 m of width within the municipal road allowance.

Please refer to Exhibit C, Tab 3, Schedule 1(iv) for pole an illustration of steel pole configuration and framing drawings. Please refer to Exhibit C, Tab 3, Schedule 1(vii) for Transmission Line plan and profile drawings.

Proposed Transmission Route

The Transmission Line will run west from the Joe Byrne Substation towards the Lakeshore Road 125 for approximately 115 m (Transmission Pole #1 to Transmission Pole #2). The Transmission Line will then turn south and run along the Lakeshore Road 125 road allowance for approximately 430m and cross the Byrnedale Road (Transmission Pole #2 to Transmission Pole

#4). The Transmission Line will continue to run south along the unopened road allowance of the Lakeshore Road 125 for approximately 1.2 km (Transmission Pole #4 to Transmission Pole #11) and cross the Highway 401. After crossing the Highway 401, it will continue to run south along the unopened road allowance of Wheatfield Road for approximately 1 km (Transmission Pole #12 to Transmission Pole #18) until it reaches N Middle Road. At N Middle Road, it will turn east and run along the road allowance of N Middle Road for approximately 900m (Transmission Pole #18 to Transmission Pole #23) until it reaches French Line Road. At French Line Road, it will turn south and run approximately 1.9 km along the road allowance of the French Line Road (Transmission Pole #23 to Transmission Pole #35) and then turn west to enter the Brody Switching Station.

A map of the Transmission Line's route is at Exhibit C, Tab 2, Schedule 1(ii).

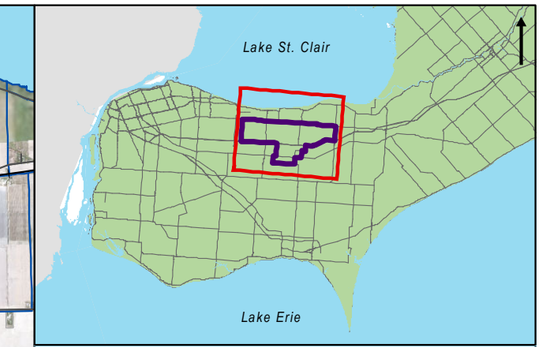
iv. The Brody Switching Station

The 230 kV Brody Switching Station will be located on private property, adjacent to the Hydro One existing 230 kV transmission line on French Line Road, as illustrated by the map at Exhibit C, Tab 2, Schedule 1(ii). The Transmission Line will connect to Hydro One's transmission system via the Brody Switching Station at connection point C23Z.

The switching station area will be approximately 60m x 45m and will be an open air facility surrounded by a chain link fence. The main components of the switching station will be two dead-end towers, a 230 kV circuit breaker, two disconnect switches, capacitive voltage transformer, current transformer, potential transformer, surge arrestors, station service transformer and a control building. The control building will house the batteries, chargers and protection and control relays.

A single line diagram of the Brody Switching Station is at Exhibit C, Tab 3, Schedule 1(iii). An illustration of the layout of the Brody Switching Station is at Exhibit C, Tab3, Tab 1(vi).

Map - The Wind Farm



Project Layout

- Turbines
- Meteorological Tower
- Collector Line
- Access Road
- Potential Transmission Line Route
- Project Location / Investigation Area
- Potential Laydown Area
- Potential Point of Interconnection
- Collector Substation / Operations & Maintenance Building

Base Layers

- Roads
- Rail Roads
- Existing Transmission Lines
- Property Boundaries
- Waterbodies
- Wooded Areas
- Project Study Area

N

0 1 2 4
Kilometres

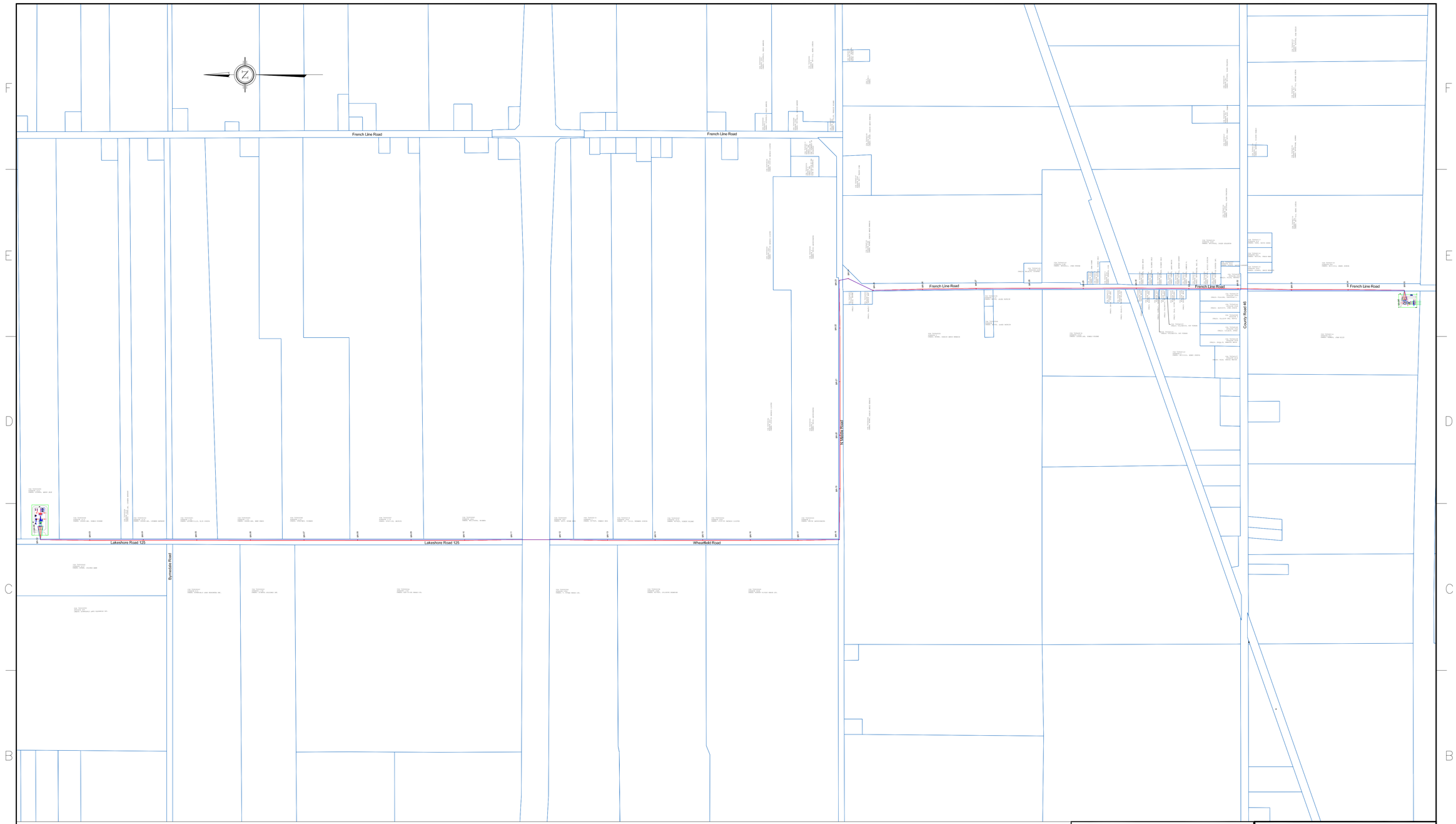
Belle River Wind Project

May 2015	1:60,000	Datum: NAD 83, Zone 17 Source: OBM, BING 2012

AECOM

Map location: F:\AECOM-Work\60321893-Belle River\Design\RE A\FINAL_Feb2015\Belle_Project\Location_20150209.mxd
Date Saved: 5/27/2015 2:31:41 PM

Map - The Transmission Line



PLAN LEGEND:

- 230kV TRANSMISSION LINE CONDUCTOR
- OPGW
- LOT LINE

REV	DDMMYY	REVISION	DR	CHK	APP	APP	APP	APP
B	10/12/15	ISSUED FOR LTC APPLICATION	T.L.	E.K.				
A	13/11/15	ISSUED FOR REVIEW	T.L.	E.K.				

ISS	DDMMYY	ISSUED FOR	APP
B	11/12/15	ISSUED FOR LTC APPLICATION	
A	13/11/15	ISSUED FOR REVIEW	

REF	NUMBER	TITLE

STAMP/SEAL

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE

PROJECT NO. | ACTIVITY NO.

SCALE N.T.S. | PACKAGE CODE

	BY	DDMMYY
DSN		04/08/15
DRN		04/08/15
CHK		
APP		

SAMSUNG

Pattern

Chimax Inc.
Engineering Company
3950 Fourteenth Ave. East, Suite 506
Markham, On., L3R 0A9
Email: chimax@chimax.ca

AREA: PATTERN ENERGY - BELLE RIVER 230 kV TRANSMISSION LINE

SUBJECT: 1CCT 230kV TRANSMISSION LINE SITE PLAN SHEET 0 OF 7

CLIENT DWG. NO.

DRAWING NO. 1523-P001-S0

REV. B

CAD FILE:

PIN 750530099
STREET# 1615
OWNER: SCHWAB, HARRY JACK

PIN 750530098
STREET# 1673
OWNER: LASSALINE, DONALD EUGENE

PIN 750530094
STREET# 1679
OWNER: LASSALINE, LEONARD ANTHONY

PIN 750530230
STREET# 1679
OWNER: LASSALINE, LEONARD ANTHONY

PIN 750530091
STREET# 1701
OWNER: QUENNEVILLE, ELIE JOSEPH

PIN 750530089
STREET# 1721
OWNER: LASSALINE, MARK DENIS

PIN 750530088
STREET# 1751
OWNER: UKRAINEC, RICHARD

CGS-DE

BR-02

BR-03

BR-04

BR-05

BR-06

BR-07

Lakeshore Road 125

Byrnedale Road

PIN 750530060
STREET# 1672
OWNER: BYRNE, DOLORES ANNE

PIN 750530062
STREET# 570
OWNER: BYRNEDALE LAND RESOURCES INC.

PIN 750530063
STREET# 1738
OWNER: JUMARCE HOLDINGS INC.

PIN 750530059
STREET# 655
OWNER: BYRNEDALE LAND RESOURCES INC.

PLAN LEGEND:

- 230kV TRANSMISSION LINE CONDUCTOR
- OPGW
- LOT LINE

REV	DDMMYY	REVISION	DR	CHK	APP	APP	APP	APP
B	10/12/15	ISSUED FOR LTC APPLICATION	T.L.	E.K.				
A	13/11/15	ISSUED FOR REVIEW	T.L.	E.K.				

ISS	DDMMYY	ISSUED FOR	APP
B	11/12/15	ISSUED FOR LTC APPLICATION	
A	13/11/15	ISSUED FOR REVIEW	

REF	NUMBER	REFERENCES	TITLE

STAMP/SEAL

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE

PROJECT NO. | ACTIVITY NO.

SCALE: N.T.S.

PACKAGE CODE

	BY	DDMMYY
DSN		04/08/15
DRN		04/08/15
CHK		
APP		

AREA: PATTERN ENERGY - BELLE RIVER 230 kV TRANSMISSION LINE

SUBJECT: 1CCT 230kV TRANSMISSION LINE SITE PLAN SHEET 1 OF 7

CLIENT DWG. NO.

DRAWING NO. 1523-P001-S1

REV. B

CAD FILE:

Chimax Inc.
Engineering Company
3950 Fourteenth Ave. East, Suite 506
Markham, On., L3R 0A9
Email: chimax@chimax.ca

PIN 750530088
STREET# 1751
OWNER: UKRAINEC, RICHARD

PIN 750530087
STREET# 1779
OWNER: SCHILLER, MAURICE

PIN 750530082
STREET# 1841
OWNER: BELLEMORE, MICHAEL

PIN 750530081
STREET# 1901
OWNER: SMIT, KOENE HERO

BR-07

BR-08

BR-09

BR-10

BR-11

BR-12

Lakeshore Road 125

PIN 750530064
STREET# 1769
OWNER: ASH RIVER FARMS LTD.

PIN 750530289
STREET# 1936
OWNER: V. BYRNE FARMS LTD.

PLAN LEGEND:

230kV TRANSMISSION LINE CONDUCTOR
OPGW
LOT LINE

REV	DDMMYY	REVISION	DR	CHK	APP	APP	APP	APP
B	10/12/15	ISSUED FOR LTC APPLICATION	T.L.	E.K.				
A	13/11/15	ISSUED FOR REVIEW	T.L.	E.K.				

ISS	DDMMYY	ISSUED FOR	APP
B	11/12/15	ISSUED FOR LTC APPLICATION	
A	13/11/15	ISSUED FOR REVIEW	

REF	NUMBER	TITLE

REFERENCES

STAMP/SEAL

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE

PROJECT NO.

ACTIVITY NO.

SCALE
N.T.S.

PACKAGE CODE

	BY	DDMMYY
DSN		04/08/15
DRN		04/08/15
CHK		
APP		

AREA
PATTERN ENERGY - BELLE RIVER
230 kV TRANSMISSION LINE

SUBJECT
1CCT 230kV TRANSMISSION LINE
SITE PLAN
SHEET 2 OF 7

CLIENT DWG. NO.

DRAWING NO.
1523-P001-S2

REV.
B

Chimax Inc.
Engineering Company
3950 Fourteenth Ave. East, Suite 506
Markham, On., L3R 0A9
Email: chimax@chimax.ca

CAD FILE:

PIN 750530081
STREET# 1901
OWNER: SMIT, KOENE HERO

PIN 750530079
STREET# 0
OWNER: RIVEST, DENNIS PAUL

PIN 750530078
STREET# 1949
OWNER: ST. LOUIS, BERNARD JOSEPH

PIN 750530287
STREET# 1979
OWNER: RIVEST, ROBERT ROLAND

PIN 750530264
STREET# 2001
OWNER: 1329705 ONTARIO LIMITED

PIN 750530265
STREET# 0
OWNER: FACCA INCORPORATED

BR-12 BR-13 BR-14 BR-15 BR-16 BR-17 BR-18 BR-19

Wheatfield Road

PIN 750530289
STREET# 1936
OWNER: V. BYRNE FARMS LTD.

PIN 750530238
STREET# 1948
OWNER: RIVEST, JULIETTE DESNEIGE

PIN 750530069
STREET# 2008
OWNER: ROBERT RIVEST FARMS LTD.

PLAN LEGEND:

230kV TRANSMISSION LINE CONDUCTOR
OPGW
LOT LINE

REV	DDMMYY	REVISION	DR	CHK	APP	APP	APP	APP
B	10/12/15	ISSUED FOR LTC APPLICATION	T.L.	E.K.				
A	13/11/15	ISSUED FOR REVIEW	T.L.	E.K.				

ISS	DDMMYY	ISSUED FOR	APP
B	11/12/15	ISSUED FOR LTC APPLICATION	
A	13/11/15	ISSUED FOR REVIEW	

REF	NUMBER	REFERENCES

STAMP/SEAL

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE

PROJECT NO. | ACTIVITY NO.

SCALE: N.T.S. | PACKAGE CODE:

	BY	DDMMYY
DSN		04/08/15
DRN		04/08/15
CHK		
APP		

AREA: PATTERN ENERGY - BELLE RIVER 230 kV TRANSMISSION LINE

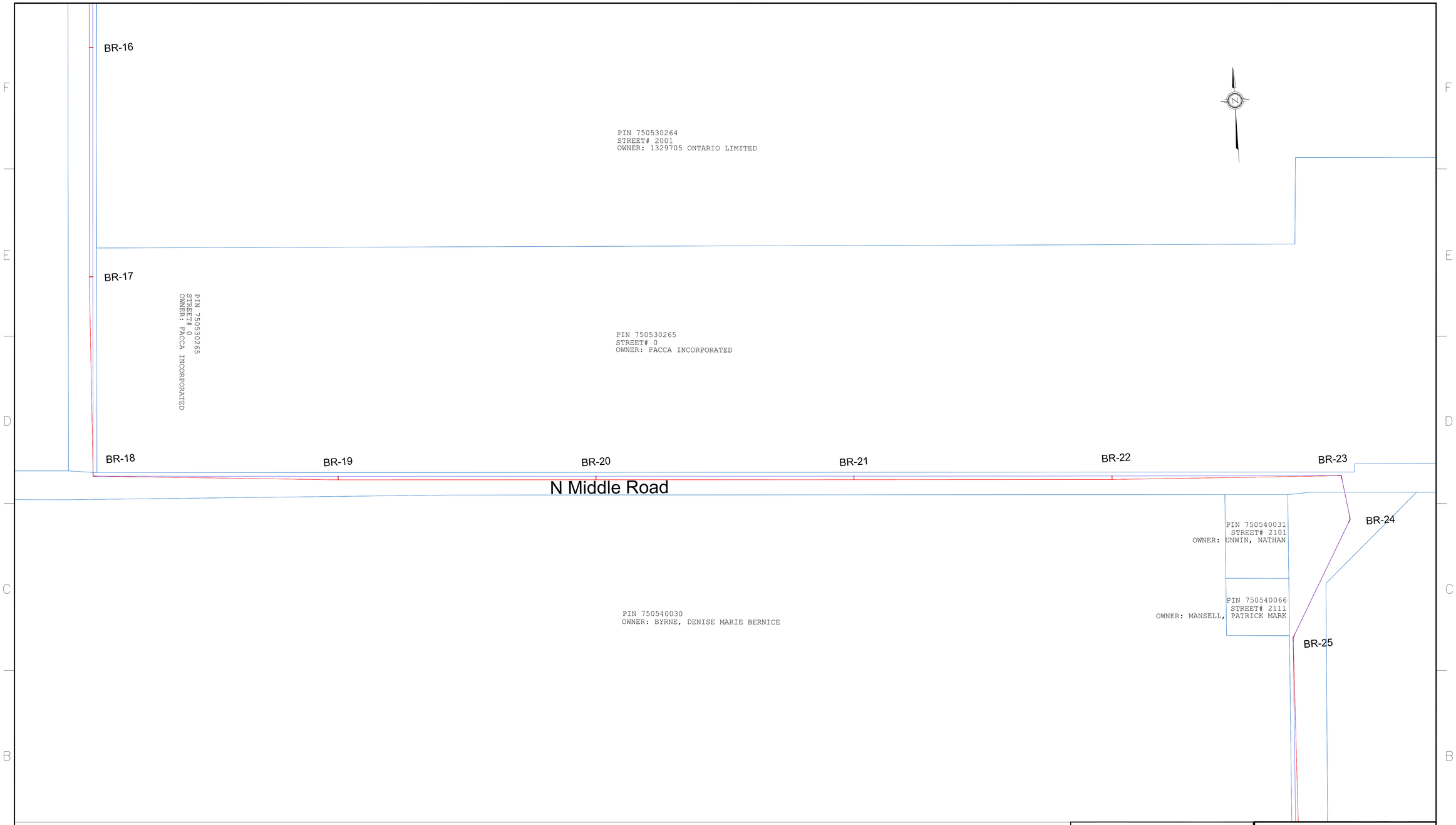
SUBJECT: 1CCT 230kV TRANSMISSION LINE SITE PLAN SHEET 3 OF 7

CLIENT DWG. NO.

DRAWING NO. 1523-P001-S3 | REV. B

Chimax Inc.
Engineering Company
3950 Fourteenth Ave. East, Suite 506
Markham, On., L3R 0A9
Email: chimax@chimax.ca

CAD FILE:



PLAN LEGEND:

- 230kV TRANSMISSION LINE CONDUCTOR
- OPGW
- LOT LINE

REV	DDMMYY	REVISION	DR	CHK	APP	APP	APP	APP
B	10/12/15	ISSUED FOR LTC APPLICATION	T.L.	E.K.				
A	13/11/15	ISSUED FOR REVIEW	T.L.	E.K.				

ISS	DDMMYY	APP	ISSUED FOR
B	11/12/15		ISSUED FOR LTC APPLICATION
A	13/11/15		ISSUED FOR REVIEW

REF	NUMBER	TITLE

STAMP/SEAL

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE

PROJECT NO. | ACTIVITY NO.

SCALE: N.T.S. | PACKAGE CODE

	BY	DDMMYY
DSN		04/08/15
DRN		04/08/15
CHK		
APP		

AREA: PATTERN ENERGY - BELLE RIVER 230 kV TRANSMISSION LINE

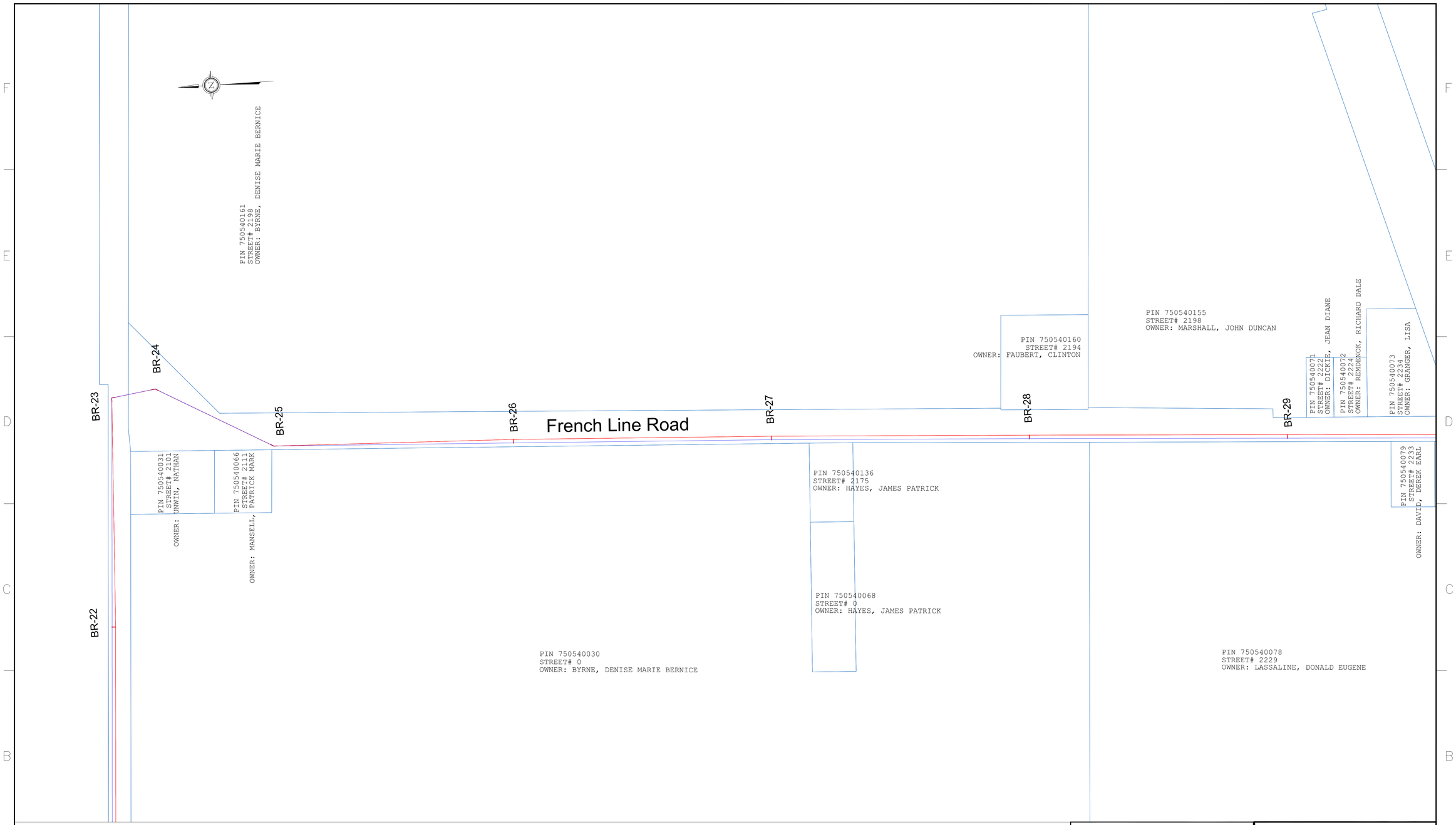
SUBJECT: 1CCT 230kV TRANSMISSION LINE SITE PLAN SHEET 4 OF 7

CLIENT DWG. NO.

DRAWING NO. 1523-P001-S4 | REV. B

CAD FILE:

Chimax Inc.
Engineering Company
3950 Fourteenth Ave. East, Suite 506
Markham, On., L3R 0A9
Email: chimax@chimax.ca



PLAN LEGEND:

- 230kV TRANSMISSION LINE CONDUCTOR
- OPGW
- LOT LINE

REV	DDMMYY	REVISION	DR	CHK	APP	APP	APP	APP
B	10/12/15	ISSUED FOR LTC APPLICATION	T.L.	E.K.				
A	13/11/15	ISSUED FOR REVIEW	T.L.	E.K.				

ISS	DDMMYY	ISSUED FOR	APP
B	11/12/15	ISSUED FOR LTC APPLICATION	
A	13/11/15	ISSUED FOR REVIEW	

REF	NUMBER	REFERENCES TITLE

STAMP/SEAL

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE

PROJECT NO. | ACTIVITY NO.

SCALE: N.T.S. | PACKAGE CODE

	BY	DDMMYY
DSN		04/08/15
DRN		04/08/15
CHK		
APP		

SAMSUNG

Pattern

Chimax Inc.
Engineering Company
3950 Fourteenth Ave. East, Suite 506
Markham, On., L3R 0A9
Email: chimax@chimax.ca

AREA: PATTERN ENERGY - BELLE RIVER 230 kV TRANSMISSION LINE

SUBJECT: 1CCT 230kV TRANSMISSION LINE SITE PLAN SHEET 5 OF 7

CLIENT DWG. NO.

DRAWING NO.: 1523-P001-S5

REV.: B

CAD FILE:

PIN 750540155
STREET# 2198
OWNER: MARSHALL, JOHN DUNCAN

PIN 750540071
STREET# 2222
OWNER: DICKIE, JEAN DIANE

PIN 750540072
STREET# 2224
OWNER: REMDENOK, RICHARD DALE

PIN 750540073
STREET# 2234
OWNER: GRANGER, LISA

BR-29

PIN 750540105
STREET# 2246
OWNER: BISSON, MONICA MARIE

BR-30

PIN 750540140
STREET# 2252
OWNER: REMDENOK, RICHARD DALE

PIN 750540104
STREET# 2260
OWNER: REMDENOK, RICHARD DALE

PIN 750540103
STREET# 2264
OWNER: DENNIS, LARRY BRUCE

PIN 750540102
STREET# 2266
OWNER: KIEBERT, ANTHONY HUBERT

PIN 750540101
STREET# 2270
OWNER: DENNIS, LYNWOOD R.

BR-31

PIN 750540100
STREET# 2274
OWNER: HARRINGTON, PAUL JR.

PIN 750540099
STREET# 2278
OWNER: ALLARD, NICOLE JOCELYN

PIN 750540098
STREET# 2288
OWNER: WOODSLEE ESTATES INC.

PIN 750540097
STREET# 2664
OWNER: ELGIE, DAVID CLARENCE

PIN 750540096
STREET# 2660
OWNER: POMPA, ANTONIO

BR-32

French Line Road

BR-33

PIN 750540106
STREET# 2692
OWNER: SKIDMORE, ROGER STAINTON

PIN 750540117
STREET# 878
OWNER: PARE, DAVID JAMES

PIN 750540116
STREET# 866
OWNER: TAYLOR, CRAIG EARL

PIN 750540115
STREET# 2665
OWNER: GIRARD, MARIE BERNICE

PIN 750540118
STREET# 894
OWNER: MAILLOUX, HENRI JOSEPH

PIN 750540118
STREET# 894
OWNER: MAILLOUX,

PIN 750540079
STREET# 2233
OWNER: DAVID, DEREK EARL

PIN 750540080
STREET# 2239
OWNER: BEZAIRE, THOMAS WILLIAM

PIN 750540083
STREET# 2249
OWNER: BISSON, MONICA MARIE

PIN 750540094
STREET# 2255
OWNER: BEATON, PETER

PIN 750540093
STREET# 2257
OWNER: RUSSELL, JAMES LAWRENCE

PIN 750540092
STREET# 2263
OWNER: TREPANIER, ROY VERNON

PIN 750540091
STREET# 2265
OWNER: CAZA, BRIAN CHRISTOPHER

PIN 750540090
STREET# 2269
OWNER: THOMSON, DAVE

PIN 750540139
STREET# 2654
OWNER: FLAMING, CHRISTINE L.

PIN 750540145
STREET# 2648
OWNER: JAKOVCIC, JOHN JOSEPH

PIN 750540088
STREET# 0
OWNER: PEZESHK ZAD, PARVIZ

PIN 750540146
STREET# 2642
OWNER: RICHARD, JAMES

PIN 750540138
STREET# 2634
OWNER: JACQUES, ANNETTE MARIE

PIN 750540137
STREET# 2618
OWNER: REEB, DANIEL WALTER

County Road 46

PIN 750540152
OWNER: TREPANIER, ROY VERNON

PIN 750540151
OWNER: TREPANIER, ROY VERNON

PIN 750540078
STREET# 2229
OWNER: LASSALINE, DONALD EUGENE

PIN 750540153
STREET# 0
OWNER: MAILLOUX, HENRI JOSEPH

PIN 750540114
STREET# 852
OWNER: FENNER, JO

PLAN LEGEND:

230kV TRANSMISSION LINE CONDUCTOR
OPGW
LOT LINE

REV	DDMMYY	REVISION	DR	CHK	APP	APP	APP	APP
B	10/12/15	ISSUED FOR LTC APPLICATION	T.L.	E.K.				
A	13/11/15	ISSUED FOR REVIEW	T.L.	E.K.				

ISS	DDMMYY	ISSUED FOR	APP
B	11/12/15	ISSUED FOR LTC APPLICATION	
A	13/11/15	ISSUED FOR REVIEW	

REF	NUMBER	REFERENCES

STAMP/SEAL

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE

PROJECT NO. ACTIVITY NO.

SCALE N.T.S.

PACKAGE CODE

	BY	DDMMYY
DSN		04/08/15
DRN		04/08/15
CHK		
APP		

SAMSUNG

Pattern

Chimax Inc.
Engineering Company
3950 Fourteenth Ave. East, Suite 506
Markham, On., L3R 0A9
Email: chimax@chimax.ca

AREA PATTERN ENERGY - BELLE RIVER 230 kV TRANSMISSION LINE

SUBJECT
1CCT 230kV TRANSMISSION LINE
SITE PLAN
SHEET 6 OF 7

CLIENT DWG. NO.

DRAWING NO. 1523-P001-S6

REV. B

CAD FILE:

PIN 750540118
STREET# 894
OWNER: MAILLOUX, HENRI JOSEPH

PIN 750540117
STREET# 878
OWNER: PARE, DAVID JAMES

PIN 750540116
STREET# 866
OWNER: TAYLOR, CRAIG EARL

ARENCE

PIN 750540115
STREET# 2665
OWNER: GIRARD, MARIE BERNICE

PIN 750540118
STREET# 894
OWNER: MAILLOUX, HENRI JOSEPH

PIN 750540130
STREET# 0
OWNER: SKIDMORE, JACK EDWARD

BR-33

BR-34

French Line Road

BR-35

SS-DE

County Road 46

PIN 750540114
STREET# 852
OWNER: FENNER, JOHN RILEY

PIN 750540113
STREET# 2597
OWNER: BROWN, GARTH VICTOR

PIN 750540127
STREET# 779
OWNER: ROY MAX FARMS LTD.

PLAN LEGEND:

230kV TRANSMISSION LINE CONDUCTOR
OPGW
LOT LINE

REV	DDMMYY	REVISION	DR	CHK	APP	APP	APP	APP
B	10/12/15	ISSUED FOR LTC APPLICATION	T.L.	E.K.				
A	13/11/15	ISSUED FOR REVIEW	T.L.	E.K.				

ISS	DDMMYY	ISSUED FOR	APP
B	11/12/15	ISSUED FOR LTC APPLICATION	
A	13/11/15	ISSUED FOR REVIEW	

REF	NUMBER	TITLE

REFERENCES

STAMP/SEAL

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE

PROJECT NO. | ACTIVITY NO.

SCALE: N.T.S.

PACKAGE CODE

	BY	DDMMYY
DSN		04/08/15
DRN		04/08/15
CHK		
APP		

AREA: PATTERN ENERGY - BELLE RIVER 230 kV TRANSMISSION LINE

SUBJECT: 1CCT 230kV TRANSMISSION LINE SITE PLAN SHEET 7 OF 7

Chimax Inc.
Engineering Company
3950 Fourteenth Ave. East, Suite 506
Markham, On., L3R 0A9
Email: chimax@chimax.ca

CLIENT DWG. NO.

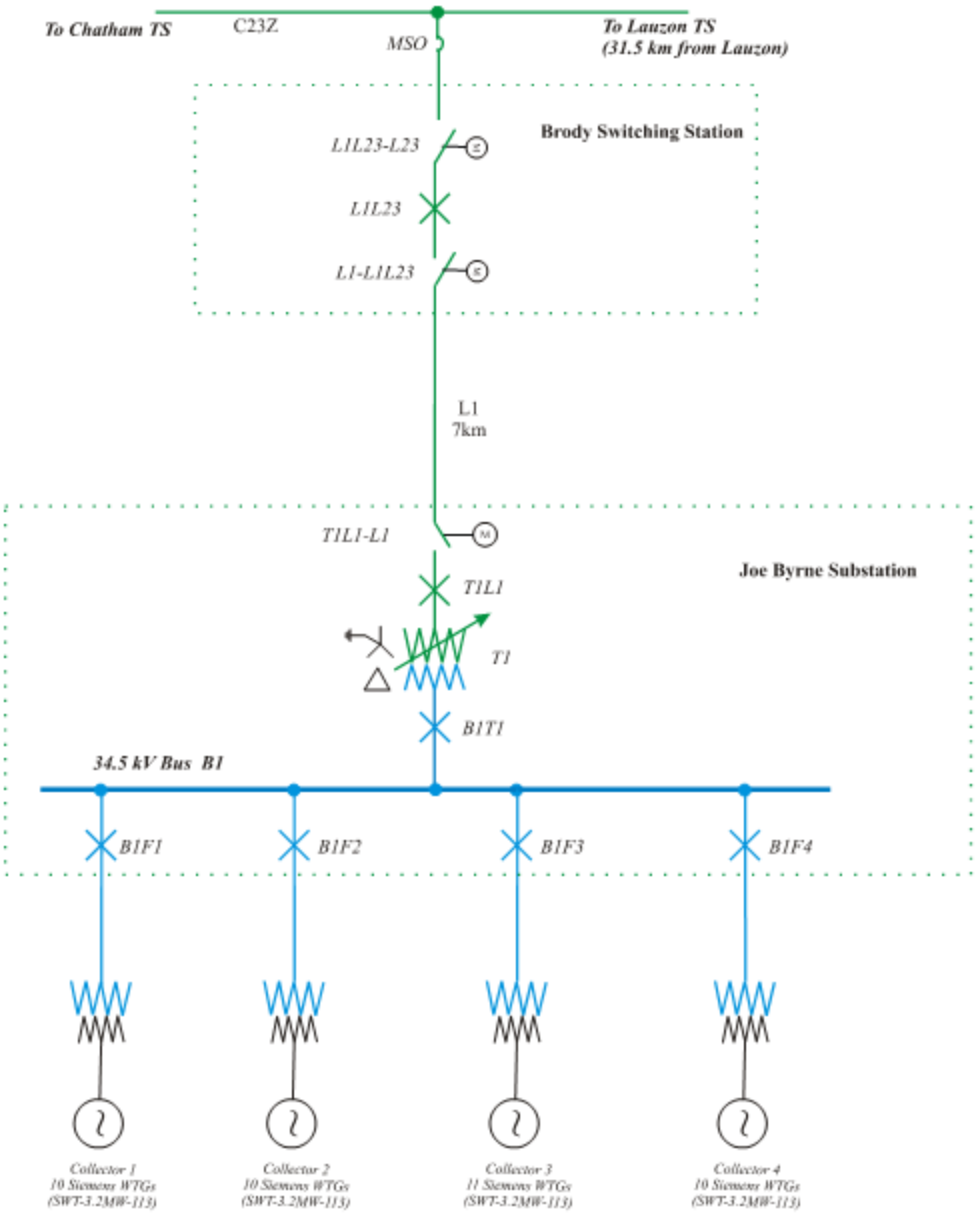
DRAWING NO. 1523-P001-S7

REV. B

CAD FILE:

Single Line Diagram of the Wind Farm and Transmission Project

Single Line Diagram of the Wind Farm and Transmission Project



Single Line Diagram of the Joe Byrne Substation

FOR CONTINUATION REFER TO 176406-2000-0F00-SLD-0001.001

L1
7.0kM CW/SHEAD TRANSMISSION CONDUCTOR SIZE 795MCM ACSR (MINIMUM SIZE)

JOE BYRNE SUBSTATION

T1L1-L1
250kV, 1050kV BIL, 1200A, 63kA RMS SYM

SA1
STATION CLASS

CVT02

T1L1
250kV, 1050kV BIL, 1200A, 63kA RMS SYM

SA10
STATION CLASS

T1
66/88/110MVA
240kV-34.5kV
ULTC ±8 X 1.25%
Z=7.5%

BUS DUCT

B1T1
CIRCUIT BREAKER
38kV, 150kV, BIL
2500A, 31.5kA RMS SYM

BUS B1, 34.5kV, 150kV BIL, 2500A, 25kA RMS SYM.

B1T21 630A
B1F1 630A
B1F2 630A
B1F3 630A
B1F4 630A
B1S1

50-50N-51-51N

A21/A27/A50BF/A87N/A81/A87L
B21/B27/B50BF/B87N/B81/B87L
A87T-A50-A51
A50BF-A51
DISTURBANCE RECORDER
B87TB-B50-B51
B50BF-B51
GRID MGMT. SYS (BY SIEMENS)

SPARE

NEXT WTG

T001
3MVA
690V-34.5kV
Z=6%

FILTER

WTG

SIEMENS 3.0MW (DE-RATED) (TYPICAL)

T21
STATION SERVICE TRANSFORMER

CCT #1
CCT #2
CCT #3
CCT #4

RS-232 METERING (DIAL-UP LINE)
ESO MAINTENANCE (DIAL-UP LINES)
ESO TELEMETRY (5 ESO)
HONI TELEMETRY (TEL LEASED LINES)
OWNER SCADA
HIGH SPEED INTERNET (WAN/DVS/BACK)
DIAL-UP LINE
HIGH SPEED INTERNET
HYDRO ONE TRANSFER TRIP "X" COMMUNICATION
HYDRO ONE TRANSFER TRIP "B" COMMUNICATION

TID

MEDIA CONVERTER
DSU/FRAD
MODEM
MODEM & SECURITY GATEWAY
MODEM & SECURITY GATEWAY
STATION TELEPHONE
BOP SCADA

FIBER OPTIC "A" FOPP-WGS
FIBER OPTIC "B" FOPP-WGS
STATION SERVER
WEB-WPS BY SIEMENS
TRANSFER TRIP "A" PROTECTION
TRANSFER TRIP "B" PROTECTION

FROM PROTECTIVE RELAYS & OTHER IED'S

PROTECTION AND CONTROL BUILDING

REVENUE METER
ATS10
"A1" AC PANELBOARD
T11
STATION SERVICE TRANSFORMER
FROM LOCAL DISTRIBUTION COMPANY LINE
BB10 BATTERY BANK
BB11 BATTERY BANK
BC10 BATTERY CHARGER
BC11 BATTERY CHARGER
MTS10
"A" DC PANELBOARD
"B" DC PANELBOARD

SWITCHGEAR BUILDING

NOTES

1. PROTECTION AND CONTROL DEVICES ARE INDICATIVE ONLY.
2. COMMUNICATION DEVICES ARE INDICATIVE ONLY.

LEGEND

21	– DISTANCE PROTECTION
27	– UNDERVOLTAGE PROTECTION
29	– ISOLATING SWITCH
43	– MANUAL SWITCH
50	– INST. OVERCURRENT PROTECTION
50N	– NEUTRAL INST. OVERCURRENT PROTECTION
50BF	– BREAKER FAILURE PROTECTION
51	– INV. TIME OVERCURRENT PROTECTION
51N	– NEUTRAL INV. TIME OVERCURRENT PROTECTION
BF	– CIRCUIT BREAKER WITH BF PROTECTION
67	– DIRECTIONAL OVERCURRENT
81	– FREQUENCY
87B	– BUS DIFFERENTIAL PROTECTION
87T	– TRANSFORMER DIFFERENTIAL PROTECTION
87L	– LINE DIFFERENTIAL PROTECTION

(K) KEY INTERLOCKS
× CURRENT TEST SWITCH
(M) MOTOR OPERATOR
TID TELECOM ISOLATING DEVICE
DR DISTURBANCE RECORDER INPUTS
HYDRO ONE OPERATING DESIGNATION
FIBRE OPTIC CABLE

NOT TO BE USED FOR CONSTRUCTION

REV	DDMMMYY	REVISION / ISSUE DESCRIPTION	DRN	CHK	APP	APP	APP	APP
D	05MAY15	ISSUED FOR SIA APPLICATION	AM	FC	SD			
C	30MAR15	ISSUED FOR SIA APPLICATION	AM	FC	SC			
B	28MAR14	ISSUED FOR USE	MM	RY	IS			
A	27MAR14	ISSUED FOR SQUAD CHECK	MM	RY	IS			

REF	NUMBER	TITLE
1	2000-DF00	BELLE RIVER 230 kV SWITCHING STATION SINGLE LINE DIAGRAM

REFERENCES

STAMP/SEAL

LICENSED PROFESSIONAL ENGINEER W. D. F. COSTA 100129016 04/05/2015 PROVINCE OF ONTARIO

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE

PROJECT NO. 176408

ACTIVITY NO.

SCALE NTS

PACKAGE CODE

	BY	DDMMMYY
DSN	BJN	25MAR14
DRN	MM	25MAR14
CHK	RY	25MAR14
APP	IS	25MAR14

SP BELLE RIVER WIND LP

AREA

SUBJECT
BELLE RIVER WIND PROJECT
230kV/34.5kV SUBSTATION
SINGLE LINE DIAGRAM

CLIENT DWG. NO.

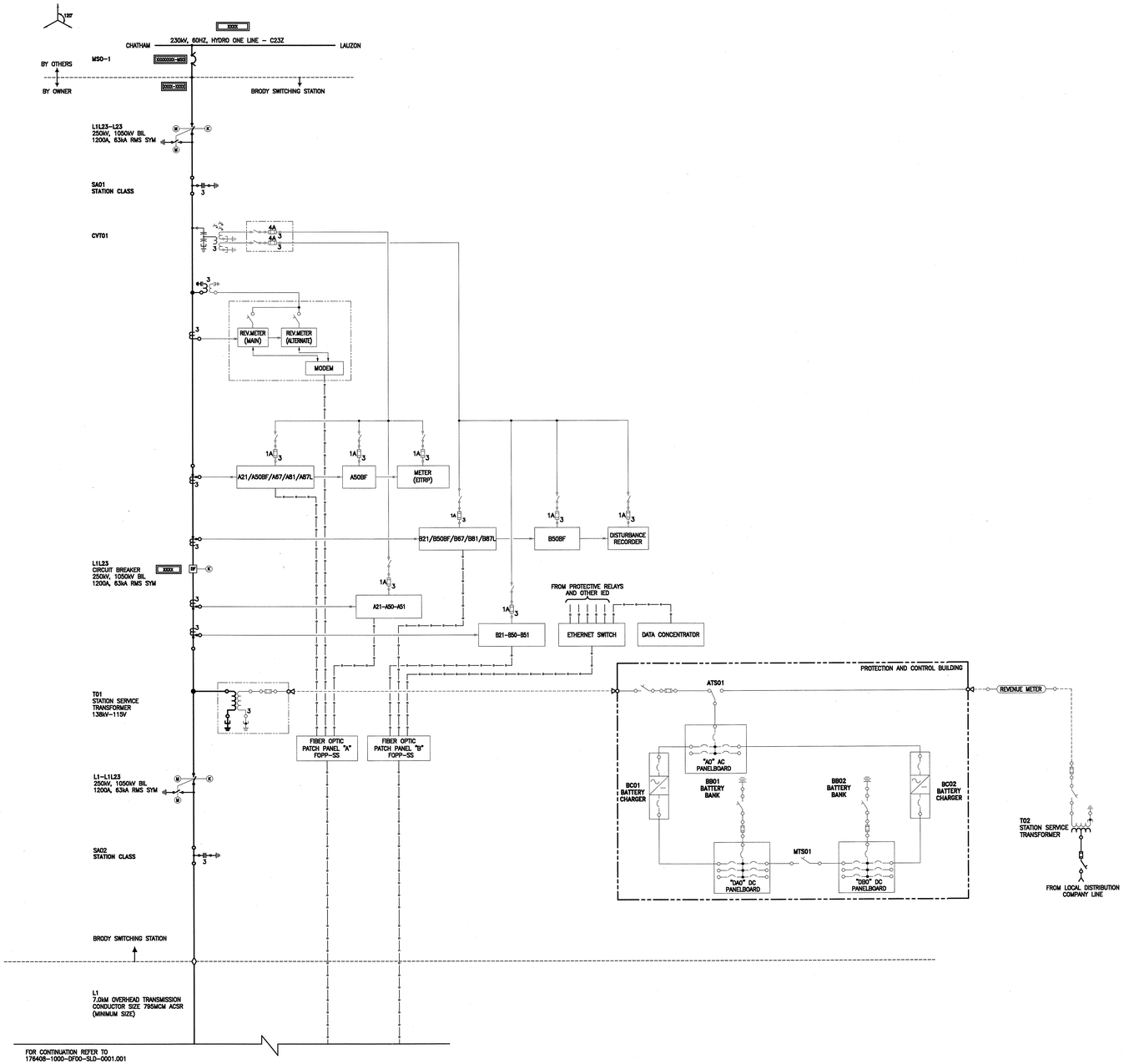
DRAWING NO. 176408-1000-DF00-SLD-0001.001

REV. D

CAD FILE: W:\176408-1000-DF00-SLD-0001.001.DWG

SAVED: 04-May-15 3:00 PM PLOTTED: 04-May-15 3:11 PM USER: MCGOWAN, ANDREW L

Single Line Diagram of the Brody Switching Station



NOTES

1. PROTECTION AND CONTROL DEVICES ARE INDICATIVE ONLY.
2. COMMUNICATION DEVICES ARE INDICATIVE ONLY.

LEGEND

21	– DISTANCE PROTECTION
27	– UNDERVOLTAGE PROTECTION
29	– ISOLATING SWITCH
43	– MANUAL SWITCH
50	– INST. OVERCURRENT PROTECTION
50N	– NEUTRAL INST. OVERCURRENT PROTECTION
50BF	– BREAKER FAILURE PROTECTION
51	– INV. TIME OVERCURRENT PROTECTION
51N	– NEUTRAL INV. TIME OVERCURRENT PROTECTION
BF	– CIRCUIT BREAKER WITH BF PROTECTION
67	– DIRECTIONAL OVERCURRENT
81	– FREQUENCY
87B	– BUS DIFFERENTIAL PROTECTION
87T	– TRANSFORMER DIFFERENTIAL PROTECTION
87L	– LINE DIFFERENTIAL PROTECTION

(K) KEY INTERLOCKS
× CURRENT TEST SWITCH
(M) MOTOR OPERATOR
TID TELECOM ISOLATING DEVICE
DR DISTURBANCE RECORDER INPUTS
HYDRO ONE OPERATING DESIGNATION
FIBRE OPTIC CABLE

NOT TO BE USED FOR CONSTRUCTION

REV	DDMMMYY	REVISION / ISSUE DESCRIPTION	DRN	CHK	APP	APP	APP	APP
D	05MAY15	ISSUED FOR SIA APPLICATION	AM	FC	SD			
C	30MAR15	ISSUED FOR SIA APPLICATION	AM	FC	SC			
B	28MAR14	ISSUED FOR USE	MM	RY	IS			
A	27MAR14	ISSUED FOR SQUAD CHECK	MM	RY	IS			

REF	NUMBER	TITLE
1	1000-DF00	BELLE RIVER 230kV/34.5kV SUBSTATION SINGLE LINE DIAGRAM

REFERENCES

STAMP/SEAL

LICENSED PROFESSIONAL ENGINEER W. B. P. COSTA 100125016 04/05/15 PROVINCE OF ONTARIO

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE

PROJECT NO. 176408 | ACTIVITY NO.

SCALE NTS | PACKAGE CODE

	BY	DDMMMYY
DSN	BJN	25MAR14
DRN	MM	25MAR14
CHK	RY	25MAR14
APP	IS	25MAR14

SP BELLE RIVER WIND LP

AREA

SUBJECT: BELLE RIVER WIND PROJECT 230kV SWITCHING STATION SINGLE LINE DIAGRAM

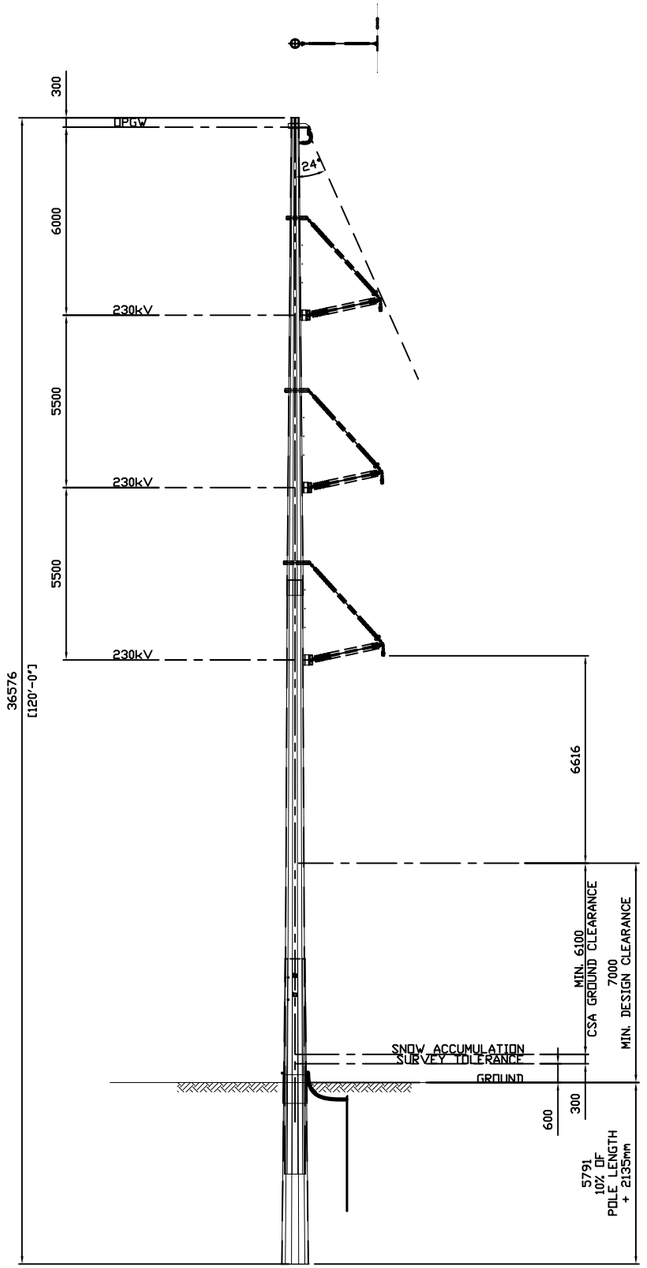
CLIENT DWG. NO.

DRAWING NO. 176408-2000-DF00-SLD-0001.001 | REV. D

CAD FILE: W:\176408-2000-DF00-SLD-0001.001.DWG

SAVED: 04-May-15 3:00 PM PLOTTED: 04-May-15 3:10 PM USER: MCGOWAN, ANDREW L

Tower Design Illustrations



1CCT 230kV TRANSMISSION LINE
TANGENT (0 - 2°) VERTICAL CONFIGURATION STEEL POLE FRAMING

DESIGN NOTES:

THE PROPOSED STRUCTURE FRAMING, POLE REQUIREMENT AND RECOMMENDATION STANDARD SPAN ARE BASED ON THE FOLLOWING DESIGN DATA:

A. DESIGN CRITERIA

1. METEOROLOGICAL LOCATION:	CHATHAM / LEAMINGTON
2. MINIMUM DESIGN LOADING	
2.1. CSA 22.3 No.1 (LIMIT STATE DESIGN) - CSA HEAVY CONDITION	
HOURLY WIND	400 Pa
RADIAL ICE THICKNESS	12.7 mm (1/2")
CONDUCTOR TEMPERATURE	-20°C
2.2. CSA 22.3 No.60826 (IEC RELIABILITY DESIGN) - 1/50 PERIOD	
(i) IEC ICE (1/50)	28 mm @ -10°C
(ii) IEC WIND (1/50)	99 km/h (482.5 Pa) @ -10°C
(iii) COMBINED ICE (85%) & WIND (60%)	23.8 mm & 183.5 Pa @ -10°C

WIRE ADJUSTMENT MODELS & MATERIAL FACTORS AS PER CSA 22.3 No. 60826.

B. CLEARANCE CRITERIA

1. MEAN ANNUAL SNOW ACCUMULATION:	0.3 m
2. ADDITIONAL SURVEY TOLERANCE:	0.6 m
3. VERTICAL GROUND CLEARANCE:	
3.1. MINIMUM CSA 22.3 No.1 VERTICAL GROUND CLEARANCE	
230kV CONDUCTOR	6.10 m
3.2. DESIGN VERTICAL GROUND CLEARANCE	
230kV CONDUCTOR	7.00 m
3.3. FARM VEHICLE VERTICAL CLEARANCE (VEHICLE 14' HEIGHT)	
230kV CONDUCTOR	7.30m
3.4. MINIMUM CSA 22.3 No.1 RAILWAY CROSSING	
230kV CONDUCTOR	9.00m
4. HORIZONTAL CLEARANCE FROM RAILWAY TRACK	
4.1. MINIMUM CSA 22.3 No.1 ALONG RAILWAY R.O.W.	
SUPPORT STRUCTURE	2.5m FROM RAILWAY
230kV CONDUCTOR	4.1m FROM RAILWAY TRACK
5. VERTICAL GROUND CLEARANCE LOADING CONDITIONS	
5.1. PHASE CONDUCTOR	
(i) MAXIMUM CONDUCTOR TEMPERATURE	100°C
(ii) DESIGN CONDUCTOR TEMPERATURE (AS PER IEEE STD. 738)	75°C
(iii) RADIAL ICE THICKNESS (CLEARANCE)	25.4 mm (1")
6. PHASE CLEARANCE CONDITIONS:	
(i) HOURLY WIND (NATIONAL BUILDING CODE 1/50)	470 Pa (~99 km/hr)
(ii) NORMAL BLOWOUT WIND	290 Pa
(iii) GALLOPING	
GALLOPING SWING	290 Pa
GALLOPING ICE	12.7 mm (1/2")

C. WIND POWER PROJECT CIRCUITS DATA

1. MERCHANT CIRCUIT(S)	
1.1. NOMINAL SYSTEM VOLTAGE	230 kV
1.2. NUMBER OF PHASES	3
1.3. SYSTEM FREQUENCY	60 Hz
1.4. NUMBER OF CIRCUIT	1 (ONE)
1.5. MAXIMUM CIRCUIT CURRENT	350 A PER CIRCUIT
1.6. PHASE CONDUCTOR SIZE	954MCM ACSR (RAIL)
1.7. DESIGN CONDUCTOR TEMPERATURE	75°C

REV	D/M/Y	REVISION	DR	CHK	APP	APP	APP	APP
A	07/10/15	ISSUED FOR REVIEW	C.L.	M.H.				

ISS	D/M/Y	ISSUED FOR	APP
A	07/10/15	ISSUED FOR REVIEW	

REF	NUMBER	REFERENCES	TITLE

STAMP/SEAL

APPROVED FOR CONSTRUCTION

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE

PROJECT NO.	ACTIVITY NO.	PACKAGE CODE

SCALE	BY	D/M/Y
N.T.S. (11"x17")	DSN. E.KWONG	17/09/15
	DRN. C.LIN	17/09/15

SAMSUNG

Pattern

Chimax Inc.
Engineering Company
3060 Fourteenth Ave. East, Suite 506
Markham, On., L3R 0A9
Email: chimax@chimax.ca

AREA: PATTERN ENERGY – BELLE RIVER 230 kV TRANSMISSION LINE

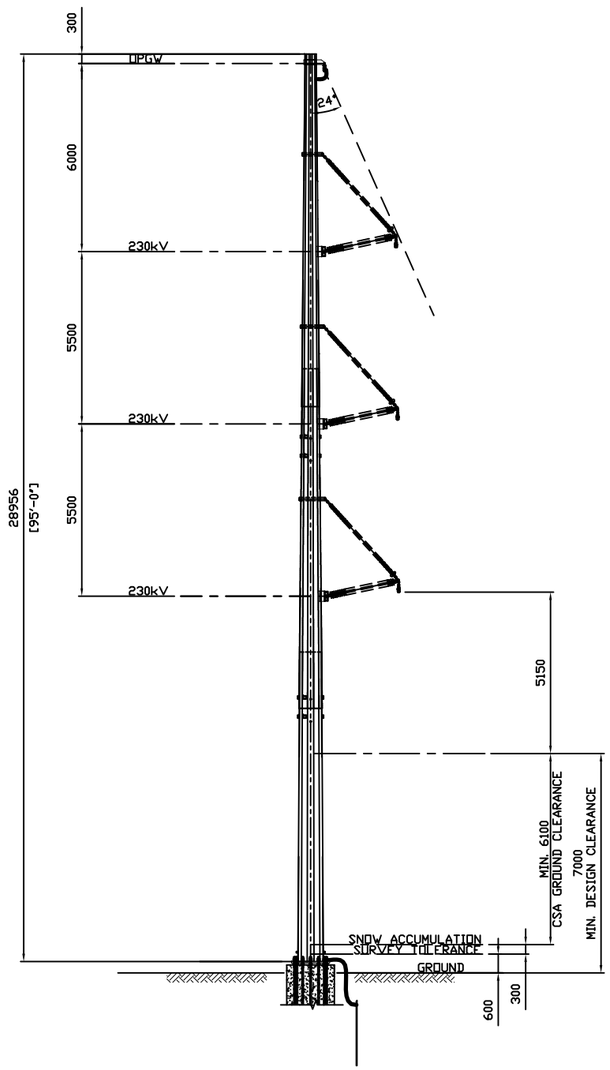
SUBJECT: 1CCT 230kV TRANSMISSION LINE TANGENT (0 – 2°) VERTICAL CONFIGURATION STEEL POLE FRAMING

CLIENT DWG. NO.

DRAWING NO.: 1523-P101A

REV.: A

CADD FILE ADDRESS: 1523-P101A-A



1CCT 230kV TRANSMISSION LINE
LIGHT ANGLE (2 - 15°) STEEL POLE FRAMING

DESIGN NOTES:

THE PROPOSED STRUCTURE FRAMING, POLE REQUIREMENT AND RECOMMENDATION STANDARD SPAN ARE BASED ON THE FOLLOWING DESIGN DATA:

A. DESIGN CRITERIA

1. METEOROLOGICAL LOCATION:	CHATHAM / LEAMINGTON
2. MINIMUM DESIGN LOADING	
2.1. CSA 22.3 No.1 (LIMIT STATE DESIGN) - CSA HEAVY CONDITION	
HOURLY WIND	400 Pa
RADIAL ICE THICKNESS	12.7 mm (1/2")
CONDUCTOR TEMPERATURE	-20°C
2.2. CSA 22.3 No.60826 (IEC RELIABILITY DESIGN) - 1/50 PERIOD	
(i) IEC ICE (1/50)	28 mm @ -10°C
(ii) IEC WIND (1/50)	99 km/h (482.5 Pa) @ -10°C
(iii) COMBINED ICE (85%) & WIND (60%)	23.8 mm & 183.5 Pa @ -10°C

WIRE ADJUSTMENT MODELS & MATERIAL FACTORS AS PER CSA 22.3 No. 60826.

B. CLEARANCE CRITERIA

1. MEAN ANNUAL SNOW ACCUMULATION:	0.3 m
2. ADDITIONAL SURVEY TOLERANCE:	0.6 m
3. VERTICAL GROUND CLEARANCE:	
3.1. MINIMUM CSA 22.3 No.1 VERTICAL GROUND CLEARANCE	
230kV CONDUCTOR	6.10 m
3.2. DESIGN VERTICAL GROUND CLEARANCE	
230kV CONDUCTOR	7.00 m
3.3. FARM VEHICLE VERTICAL CLEARANCE (VEHICLE 14' HEIGHT)	
230kV CONDUCTOR	7.30m
3.4. MINIMUM CSA 22.3 No.1 RAILWAY CROSSING	
230kV CONDUCTOR	9.00m
4. HORIZONTAL CLEARANCE FROM RAILWAY TRACK	
4.1. MINIMUM CSA 22.3 No.1 ALONG RAILWAY R.O.W.	
SUPPORT STRUCTURE	2.5m FROM RAILWAY
230kV CONDUCTOR	4.1m FROM RAILWAY TRACK
5. VERTICAL GROUND CLEARANCE LOADING CONDITIONS	
5.1. PHASE CONDUCTOR	
(i) MAXIMUM CONDUCTOR TEMPERATURE	100°C
(ii) DESIGN CONDUCTOR TEMPERATURE (AS PER IEEE STD. 738)	75°C
(iii) RADIAL ICE THICKNESS (CLEARANCE)	25.4 mm (1")
6. PHASE CLEARANCE CONDITIONS:	
(i) HOURLY WIND (NATIONAL BUILDING CODE 1/50)	470 Pa (~99 km/hr)
(ii) NORMAL BLOWOUT WIND	290 Pa
(iii) GALLOPING	
GALLOPING SWING	290 Pa
GALLOPING ICE	12.7 mm (1/2")

C. WIND POWER PROJECT CIRCUITS DATA

1. MERCHANT CIRCUIT(S)	
1.1. NOMINAL SYSTEM VOLTAGE	230 kV
1.2. NUMBER OF PHASES	3
1.3. SYSTEM FREQUENCY	60 Hz
1.4. NUMBER OF CIRCUIT	1 (ONE)
1.5. MAXIMUM CIRCUIT CURRENT	350 A PER CIRCUIT
1.6. PHASE CONDUCTOR SIZE	954MCM ACSR (RAIL)
1.7. DESIGN CONDUCTOR TEMPERATURE	75°C

REV	D/M/Y	REVISION	C.L.	M.M.				
			DR	CHK	APP	APP	APP	APP
A	07/10/15	ISSUED FOR REVIEW						

ISS	D/M/Y	ISSUED FOR	APP
A	07/10/15	ISSUED FOR REVIEW	

REF	NUMBER	TITLE
		REFERENCES

STAMP/SEAL

APPROVED FOR CONSTRUCTION

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE

PROJECT NO.	ACTIVITY NO.	PACKAGE CODE

SCALE	BY	D/M/Y
N.T.S. (11"x17")	DSN. E.KWONG	17/09/15
	DRN. C.LIN	17/09/15

SAMSUNG

Pattern

Chimax Inc.
Engineering Company
3950 Fourteenth Ave. East, Suite 506
Markham, On., L3R 0A9
Email: chimax@chimax.ca

AREA: PATTERN ENERGY - BELLE RIVER 230 kV TRANSMISSION LINE

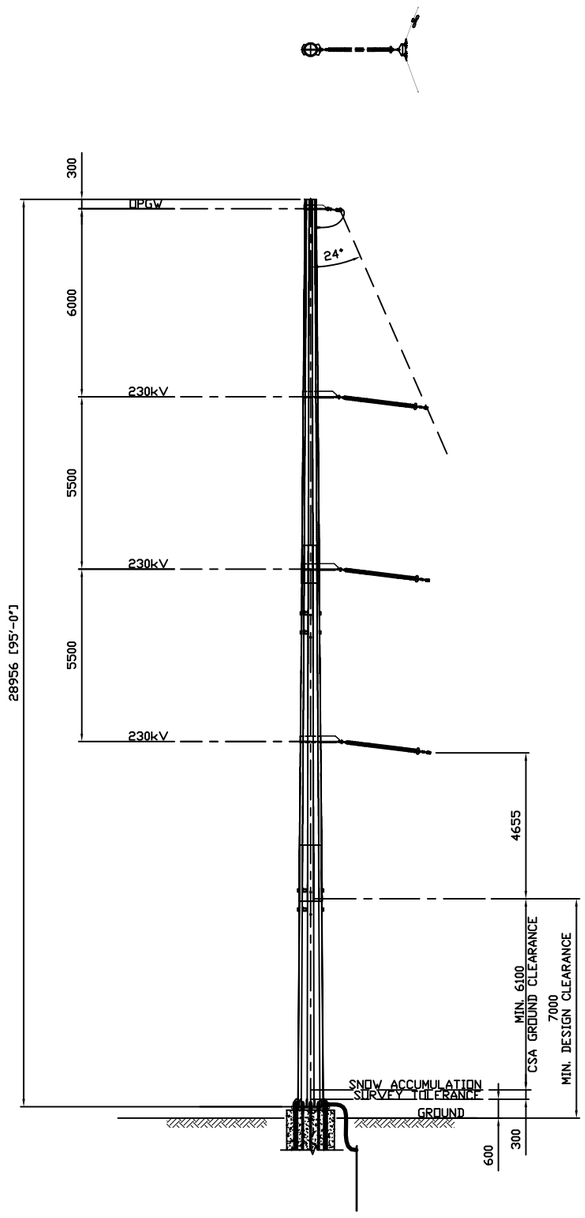
SUBJECT: 1CCT 230kV TRANSMISSION LINE LIGHT ANGLE (2 - 15°) STEEL POLE FRAMING

CLIENT DWG. NO.

DRAWING NO. 1523-P102A

REV. A

CADD FILE ADDRESS \1523-P102A-A



1CCT 230kV TRANSMISSION LINE
MEDIUM ANGLE (15 - 30°) STEEL POLE FRAMING

DESIGN NOTES:

THE PROPOSED STRUCTURE FRAMING, POLE REQUIREMENT AND RECOMMENDATION STANDARD SPAN ARE BASED ON THE FOLLOWING DESIGN DATA:

A. DESIGN CRITERIA

1. METEOROLOGICAL LOCATION:	CHATHAM / LEAMINGTON
2. MINIMUM DESIGN LOADING	
2.1. CSA 22.3 No.1 (LIMIT STATE DESIGN) - CSA HEAVY CONDITION	
HOURLY WIND	400 Pa
RADIAL ICE THICKNESS	12.7 mm (1/2")
CONDUCTOR TEMPERATURE	-20°C
2.2. CSA 22.3 No.60826 (IEC RELIABILITY DESIGN) - 1/50 PERIOD	
(i) IEC ICE (1/50)	28 mm @ -10°C
(ii) IEC WIND (1/50)	99 km/h (482.5 Pa) @ -10°C
(iii) COMBINED ICE (85%) & WIND (60%)	23.8 mm & 183.5 Pa @ -10°C

WIRE ADJUSTMENT MODELS & MATERIAL FACTORS AS PER CSA 22.3 No. 60826.

B. CLEARANCE CRITERIA

1. MEAN ANNUAL SNOW ACCUMULATION:	0.3 m
2. ADDITIONAL SURVEY TOLERANCE:	0.6 m
3. VERTICAL GROUND CLEARANCE:	
3.1. MINIMUM CSA 22.3 No.1 VERTICAL GROUND CLEARANCE	
230kV CONDUCTOR	6.10 m
3.2. DESIGN VERTICAL GROUND CLEARANCE	
230kV CONDUCTOR	7.00 m
3.3. FARM VEHICLE VERTICAL CLEARANCE (VEHICLE 14' HEIGHT)	
230kV CONDUCTOR	7.30m
3.4. MINIMUM CSA 22.3 No.1 RAILWAY CROSSING	
230kV CONDUCTOR	9.00m
4. HORIZONTAL CLEARANCE FROM RAILWAY TRACK	
4.1. MINIMUM CSA 22.3 No.1 ALONG RAILWAY R.O.W.	
SUPPORT STRUCTURE	2.5m FROM RAILWAY
230kV CONDUCTOR	4.1m FROM RAILWAY TRACK
5. VERTICAL GROUND CLEARANCE LOADING CONDITIONS	
5.1. PHASE CONDUCTOR	
(i) MAXIMUM CONDUCTOR TEMPERATURE	100°C
(ii) DESIGN CONDUCTOR TEMPERATURE (AS PER IEEE STD. 738)	75°C
(iii) RADIAL ICE THICKNESS (CLEARANCE)	25.4 mm (1")
6. PHASE CLEARANCE CONDITIONS:	
(i) HOURLY WIND (NATIONAL BUILDING CODE 1/50)	470 Pa (~99 km/hr)
(ii) NORMAL BLOWOUT WIND	290 Pa
(iii) GALLOPING	
GALLOPING SWING	290 Pa
GALLOPING ICE	12.7 mm (1/2")

C. WIND POWER PROJECT CIRCUITS DATA

1. MERCHANT CIRCUIT(S)	
1.1. NOMINAL SYSTEM VOLTAGE	230 kV
1.2. NUMBER OF PHASES	3
1.3. SYSTEM FREQUENCY	60 Hz
1.4. NUMBER OF CIRCUIT	1 (ONE)
1.5. MAXIMUM CIRCUIT CURRENT	350 A PER CIRCUIT
1.6. PHASE CONDUCTOR SIZE	954MCM ACSR (RAIL)
1.7. DESIGN CONDUCTOR TEMPERATURE	75°C

REV	D/M/Y	REVISION	C.L.	M.M.				
			DR	CHK	APP	APP	APP	APP
A	07/10/15	ISSUED FOR REVIEW						

ISS	D/M/Y	ISSUED FOR	APP
A	07/10/15	ISSUED FOR REVIEW	

REF	NUMBER	REFERENCES TITLE

STAMP/SEAL

APPROVED FOR CONSTRUCTION

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE

PROJECT NO.	ACTIVITY NO.	PACKAGE CODE

SCALE: N.T.S. (11"x17")

	BY	D/M/Y
DSN.	E.KWONG	17/09/15
DRN.	C.LIN	17/09/15

AREA: PATTERN ENERGY - BELLE RIVER 230 kV TRANSMISSION LINE

SUBJECT: 1CCT 230kV TRANSMISSION LINE MEDIUM ANGLE (15 - 30°) STEEL POLE FRAMING

SAMSUNG

Pattern

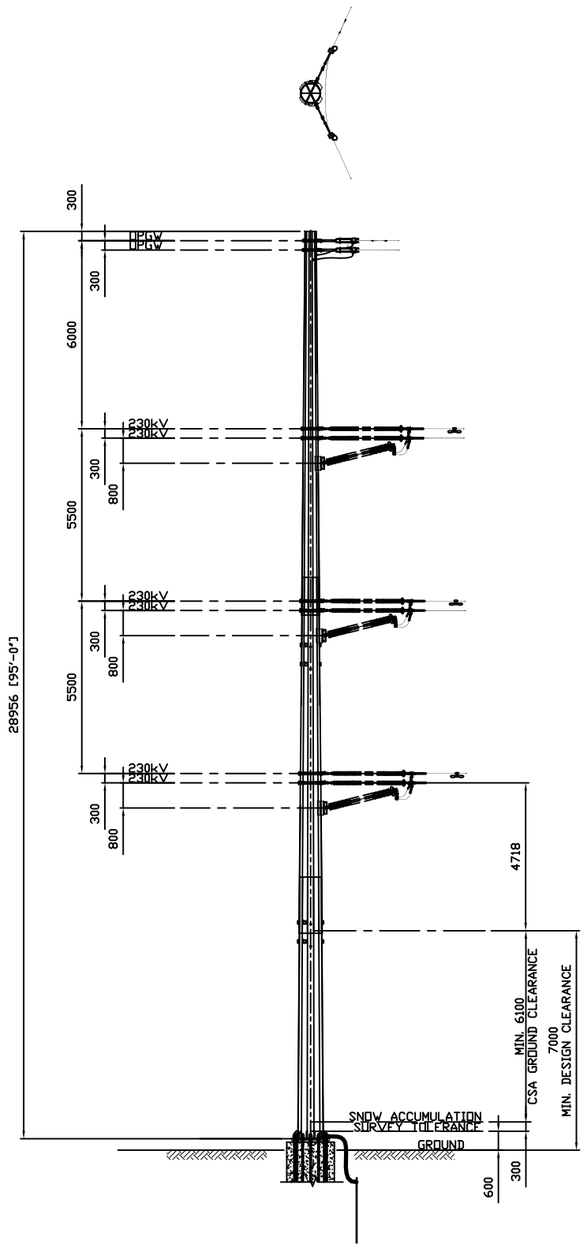
Chimax Inc.
Engineering Company
3650 Fourteenth Ave. East, Suite 506
Markham, On., L3R 0A9
Email: chimax@chimax.ca

CLIENT DWG. NO.

DRAWING NO.: 1523-P103A

REV.: A

CADD FILE ADDRESS: 1523-P103A-A



1CCT 230kV TRANSMISSION LINE
MEDIUM ANGLE (30 - 60°) STEEL POLE FRAMING

DESIGN NOTES:

THE PROPOSED STRUCTURE FRAMING, POLE REQUIREMENT AND RECOMMENDATION STANDARD SPAN ARE BASED ON THE FOLLOWING DESIGN DATA:

A. DESIGN CRITERIA

1. METEOROLOGICAL LOCATION:	CHATHAM / LEAMINGTON
2. MINIMUM DESIGN LOADING	
2.1. CSA 22.3 No.1 (LIMIT STATE DESIGN) - CSA HEAVY CONDITION	
HOURLY WIND	400 Pa
RADIAL ICE THICKNESS	12.7 mm (1/2")
CONDUCTOR TEMPERATURE	-20°C
2.2. CSA 22.3 No.60826 (IEC RELIABILITY DESIGN) - 1/50 PERIOD	
(i) IEC ICE (1/50)	28 mm @ -10°C
(ii) IEC WIND (1/50)	99 km/h (482.5 Pa) @ -10°C
(iii) COMBINED ICE (85%) & WIND (60%)	23.8 mm & 183.5 Pa @ -10°C

WIRE ADJUSTMENT MODELS & MATERIAL FACTORS AS PER CSA 22.3 No. 60826.

B. CLEARANCE CRITERIA

1. MEAN ANNUAL SNOW ACCUMULATION:	0.3 m
2. ADDITIONAL SURVEY TOLERANCE:	0.6 m
3. VERTICAL GROUND CLEARANCE:	
3.1. MINIMUM CSA 22.3 No.1 VERTICAL GROUND CLEARANCE	
230kV CONDUCTOR	6.10 m
3.2. DESIGN VERTICAL GROUND CLEARANCE	
230kV CONDUCTOR	7.00 m
3.3. FARM VEHICLE VERTICAL CLEARANCE (VEHICLE 14' HEIGHT)	
230kV CONDUCTOR	7.30m
3.4. MINIMUM CSA 22.3 No.1 RAILWAY CROSSING	
230kV CONDUCTOR	9.00m
4. HORIZONTAL CLEARANCE FROM RAILWAY TRACK	
4.1. MINIMUM CSA 22.3 No.1 ALONG RAILWAY R.O.W.	
SUPPORT STRUCTURE	2.5m FROM RAILWAY
230kV CONDUCTOR	4.1m FROM RAILWAY TRACK
5. VERTICAL GROUND CLEARANCE LOADING CONDITIONS	
5.1. PHASE CONDUCTOR	
(i) MAXIMUM CONDUCTOR TEMPERATURE	100°C
(ii) DESIGN CONDUCTOR TEMPERATURE (AS PER IEEE STD. 738)	75°C
(iii) RADIAL ICE THICKNESS (CLEARANCE)	25.4 mm (1")
6. PHASE CLEARANCE CONDITIONS:	
(i) HOURLY WIND (NATIONAL BUILDING CODE 1/50)	470 Pa (~99 km/hr)
(ii) NORMAL BLOWOUT WIND	290 Pa
(iii) GALLOPING	
GALLOPING SWING	290 Pa
GALLOPING ICE	12.7 mm (1/2")

C. WIND POWER PROJECT CIRCUITS DATA

1. MERCHANT CIRCUIT(S)	
1.1. NOMINAL SYSTEM VOLTAGE	230 kV
1.2. NUMBER OF PHASES	3
1.3. SYSTEM FREQUENCY	60 Hz
1.4. NUMBER OF CIRCUIT	1 (ONE)
1.5. MAXIMUM CIRCUIT CURRENT	350 A PER CIRCUIT
1.6. PHASE CONDUCTOR SIZE	954MCM ACSR (RAIL)
1.7. DESIGN CONDUCTOR TEMPERATURE	75°C

REV	D/M/Y	REVISION	C.L. DR	M.M. CHK	APP	APP	APP	APP
A	07/10/15	ISSUED FOR REVIEW						

ISS	D/M/Y	ISSUED FOR	APP
A	07/10/15	ISSUED FOR REVIEW	

REF	NUMBER	REFERENCES TITLE

STAMP/SEAL

APPROVED FOR CONSTRUCTION

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE

AREA: PATTERN ENERGY - BELLE RIVER 230 kV TRANSMISSION LINE

PROJECT NO. | ACTIVITY NO. | PACKAGE CODE

SUBJECT: 1CCT 230kV TRANSMISSION LINE MEDIUM ANGLE (30 - 60°) STEEL POLE FRAMING

SCALE: N.T.S. (11"x17")

	BY	D/M/Y
DSN.	E.KWONG	17/09/15
DRN.	C.LIN	17/09/15

CLIENT DWG. NO.

DRAWING NO.: 1523-P104A

REV.: A

CADD FILE ADDRESS: \1523-P104A-A

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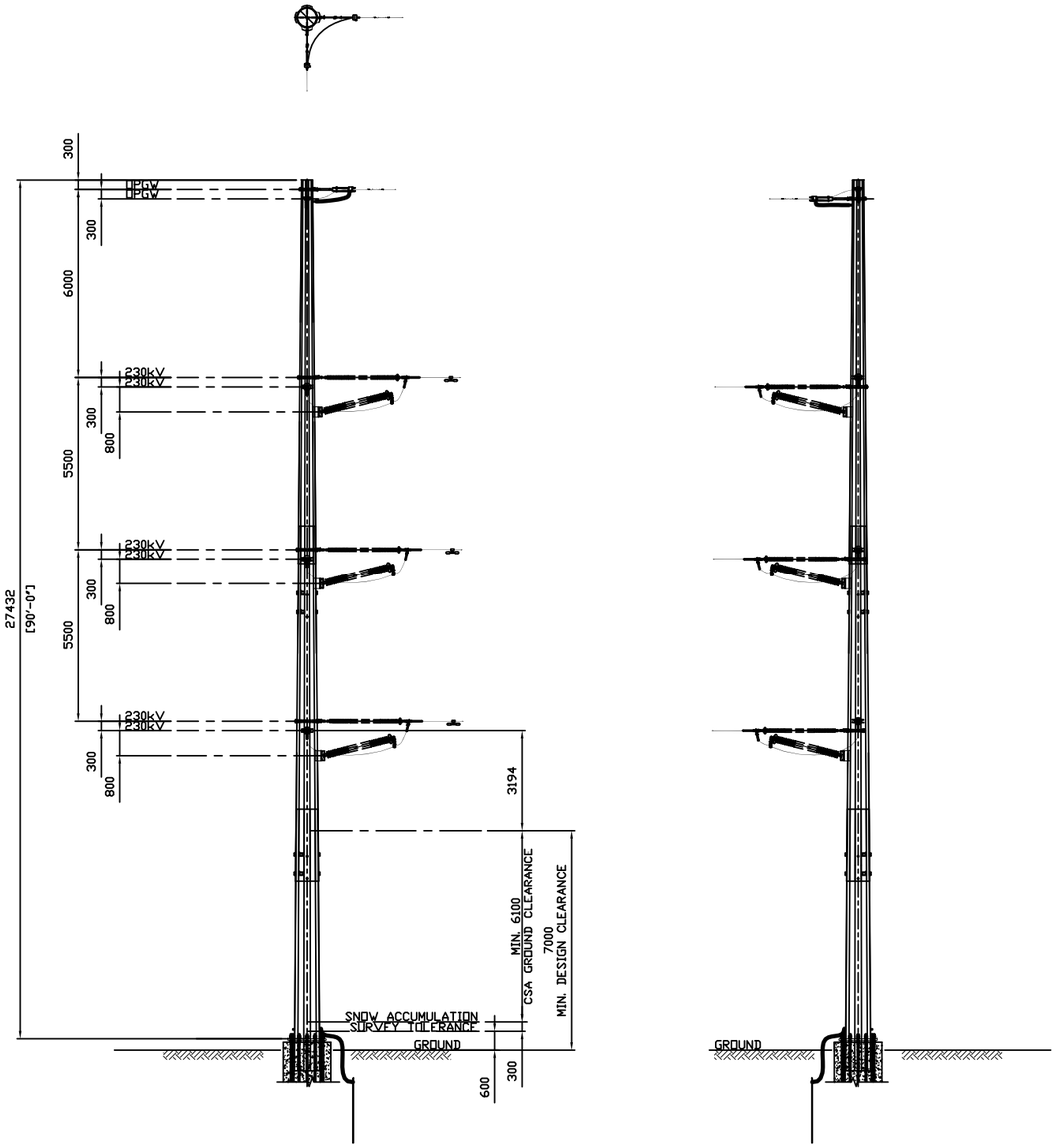
Email: chimax@chimax.ca



1CCT 230kV TRANSMISSION LINE
HEAVY ANGLE (60 - 90°) STEEL POLE FRAMING

DESIGN NOTES:

THE PROPOSED STRUCTURE FRAMING, POLE REQUIREMENT AND RECOMMENDATION STANDARD SPAN ARE BASED ON THE FOLLOWING DESIGN DATA:

A. DESIGN CRITERIA

1. METEOROLOGICAL LOCATION:	CHATHAM / LEAMINGTON
2. MINIMUM DESIGN LOADING	
2.1. CSA 22.3 No.1 (LIMIT STATE DESIGN) - CSA HEAVY CONDITION	
HOURLY WIND	400 Pa
RADIAL ICE THICKNESS	12.7 mm (1/2")
CONDUCTOR TEMPERATURE	-20°C
2.2. CSA 22.3 No.60826 (IEC RELIABILITY DESIGN) - 1/50 PERIOD	
(i) IEC ICE (1/50)	28 mm @ -10°C
(ii) IEC WIND (1/50)	99 km/h (482.5 Pa) @ -10°C
(iii) COMBINED ICE (85%) & WIND (60%)	23.8 mm & 183.5 Pa @ -10°C

WIRE ADJUSTMENT MODELS & MATERIAL FACTORS AS PER CSA 22.3 No. 60826.

B. CLEARANCE CRITERIA

1. MEAN ANNUAL SNOW ACCUMULATION:	0.3 m
2. ADDITIONAL SURVEY TOLERANCE:	0.6 m
3. VERTICAL GROUND CLEARANCE:	
3.1. MINIMUM CSA 22.3 No.1 VERTICAL GROUND CLEARANCE	
230kV CONDUCTOR	6.10 m
3.2. DESIGN VERTICAL GROUND CLEARANCE	
230kV CONDUCTOR	7.00 m
3.3. FARM VEHICLE VERTICAL CLEARANCE (VEHICLE 14' HEIGHT)	
230kV CONDUCTOR	7.30m
3.4. MINIMUM CSA 22.3 No.1 RAILWAY CROSSING	
230kV CONDUCTOR	9.00m
4. HORIZONTAL CLEARANCE FROM RAILWAY TRACK	
4.1. MINIMUM CSA 22.3 No.1 ALONG RAILWAY R.O.W.	
SUPPORT STRUCTURE	2.5m FROM RAILWAY
230kV CONDUCTOR	4.1m FROM RAILWAY TRACK
5. VERTICAL GROUND CLEARANCE LOADING CONDITIONS	
5.1. PHASE CONDUCTOR	
(i) MAXIMUM CONDUCTOR TEMPERATURE	100°C
(ii) DESIGN CONDUCTOR TEMPERATURE (AS PER IEEE STD. 738)	75°C
(iii) RADIAL ICE THICKNESS (CLEARANCE)	25.4 mm (1")
6. PHASE CLEARANCE CONDITIONS:	
(i) HOURLY WIND (NATIONAL BUILDING CODE 1/50)	470 Pa (~99 km/hr)
(ii) NORMAL BLOWOUT WIND	290 Pa
(iii) GALLOPING	
GALLOPING SWING	290 Pa
GALLOPING ICE	12.7 mm (1/2")

C. WIND POWER PROJECT CIRCUITS DATA

1. MERCHANT CIRCUIT(S)	
1.1. NOMINAL SYSTEM VOLTAGE	230 kV
1.2. NUMBER OF PHASES	3
1.3. SYSTEM FREQUENCY	60 Hz
1.4. NUMBER OF CIRCUIT	1 (ONE)
1.5. MAXIMUM CIRCUIT CURRENT	350 A PER CIRCUIT
1.6. PHASE CONDUCTOR SIZE	954MCM ACSR (RAIL)
1.7. DESIGN CONDUCTOR TEMPERATURE	75°C

REV	D/M/Y	REVISION	C.L. DR	M.M. CHK	APP	APP	APP	APP
A	07/10/15	ISSUED FOR REVIEW						

ISS	D/M/Y	ISSUED FOR	APP
A	07/10/15	ISSUED FOR REVIEW	

REF	NUMBER	REFERENCES

STAMP/SEAL

APPROVED FOR CONSTRUCTION

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE

AREA: PATTERN ENERGY - BELLE RIVER 230 kV TRANSMISSION LINE

PROJECT NO. | ACTIVITY NO. | PACKAGE CODE

SUBJECT: 1CCT 230kV TRANSMISSION LINE HEAVY ANGLE (60 - 90°) STEEL POLE FRAMING

CLIENT DWG. NO.

SCALE: N.T.S. (11"x17")

	BY	D/M/Y
DSN.	E.KWONG	17/09/15
DRN.	C.LIN	17/09/15

DRAWING NO.: 1523-P105A

REV.: A

CADD FILE ADDRESS: 1523-P105A-A

Chimax Inc.
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3650 Fourteenth Ave. East, Suite 506
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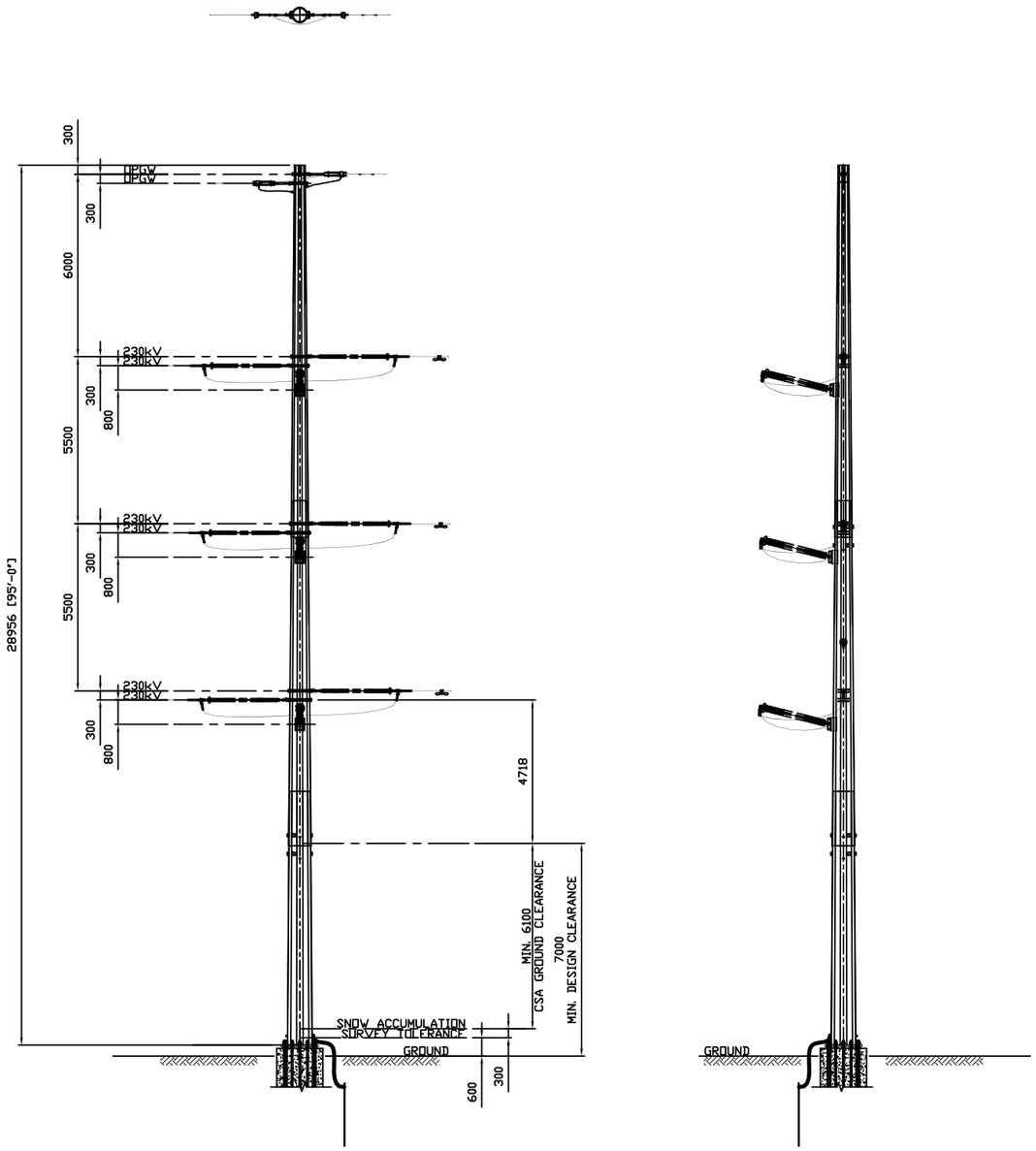
Email: chimax@chimax.ca



1CCT 230kV TRANSMISSION LINE
DOUBLE DEADEND STEEL POLE FRAMING

DESIGN NOTES:

THE PROPOSED STRUCTURE FRAMING, POLE REQUIREMENT AND RECOMMENDATION STANDARD SPAN ARE BASED ON THE FOLLOWING DESIGN DATA:

A. DESIGN CRITERIA

1.	METEOROLOGICAL LOCATION:	CHATHAM / LEAMINGTON
2.	MINIMUM DESIGN LOADING	
2.1.	CSA 22.3 No.1 (LIMIT STATE DESIGN) - CSA HEAVY CONDITION	
	HOURLY WIND	400 Pa
	RADIAL ICE THICKNESS	12.7 mm (1/2")
	CONDUCTOR TEMPERATURE	-20°C
2.2.	CSA 22.3 No.60826 (IEC RELIABILITY DESIGN) - 1/50 PERIOD	
(i)	IEC ICE (1/50)	28 mm @ -10°C
(ii)	IEC WIND (1/50)	99 km/h (482.5 Pa) @ -10°C
(iii)	COMBINED ICE (85%) & WIND (60%)	23.8 mm & 183.5 Pa @ -10°C

WIRE ADJUSTMENT MODELS & MATERIAL FACTORS AS PER CSA 22.3 No. 60826.

B. CLEARANCE CRITERIA

1.	MEAN ANNUAL SNOW ACCUMULATION:	0.3 m
2.	ADDITIONAL SURVEY TOLERANCE:	0.6 m
3.	VERTICAL GROUND CLEARANCE:	
3.1.	MINIMUM CSA 22.3 No.1 VERTICAL GROUND CLEARANCE	
	230kV CONDUCTOR	6.10 m
3.2.	DESIGN VERTICAL GROUND CLEARANCE	
	230kV CONDUCTOR	7.00 m
3.3.	FARM VEHICLE VERTICAL CLEARANCE (VEHICLE 14' HEIGHT)	
	230kV CONDUCTOR	7.30m
3.4.	MINIMUM CSA 22.3 No.1 RAILWAY CROSSING	
	230kV CONDUCTOR	9.00m
4.	HORIZONTAL CLEARANCE FROM RAILWAY TRACK	
4.1.	MINIMUM CSA 22.3 No.1 ALONG RAILWAY R.O.W.	
	SUPPORT STRUCTURE	2.5m FROM RAILWAY
	230kV CONDUCTOR	4.1m FROM RAILWAY TRACK
5.	VERTICAL GROUND CLEARANCE LOADING CONDITIONS	
5.1.	PHASE CONDUCTOR	
(i)	MAXIMUM CONDUCTOR TEMPERATURE	100°C
(ii)	DESIGN CONDUCTOR TEMPERATURE (AS PER IEEE STD. 738)	75°C
(iii)	RADIAL ICE THICKNESS (CLEARANCE)	25.4 mm (1")
6.	PHASE CLEARANCE CONDITIONS:	
(i)	HOURLY WIND (NATIONAL BUILDING CODE 1/50)	470 Pa (~99 km/hr)
(ii)	NORMAL BLOWOUT WIND	290 Pa
(iii)	GALLOPING	
	GALLOPING SWING	290 Pa
	GALLOPING ICE	12.7 mm (1/2")

C. WIND POWER PROJECT CIRCUITS DATA

1.	MERCHANT CIRCUIT(S)	
1.1.	NOMINAL SYSTEM VOLTAGE	230 kV
1.2.	NUMBER OF PHASES	3
1.3.	SYSTEM FREQUENCY	60 Hz
1.4.	NUMBER OF CIRCUIT	1 (ONE)
1.5.	MAXIMUM CIRCUIT CURRENT	350 A PER CIRCUIT
1.6.	PHASE CONDUCTOR SIZE	954MCM ACSR (RAIL)
1.7.	DESIGN CONDUCTOR TEMPERATURE	75°C

REV	D/M/Y	REVISION	DR	CHK	APP	APP	APP	APP
A	07/10/15	ISSUED FOR REVIEW	C.L	M.H.				

ISS	D/M/Y	ISSUED FOR	APP
A	07/10/15	ISSUED FOR REVIEW	

REF	NUMBER	REFERENCES	TITLE

STAMP/SEAL

APPROVED FOR CONSTRUCTION

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE

AREA: PATTERN ENERGY – BELLE RIVER 230 kV TRANSMISSION LINE

PROJECT NO. | ACTIVITY NO. | PACKAGE CODE

SUBJECT: 1CCT 230kV TRANSMISSION LINE DOUBLE DEADEND STEEL POLE FRAMING

SCALE	BY	D/M/Y
N.T.S. (11"x17")	DSN. E.KWONG	17/09/15
	DRN. C.LIN	17/09/15

SAMSUNG

Pattern

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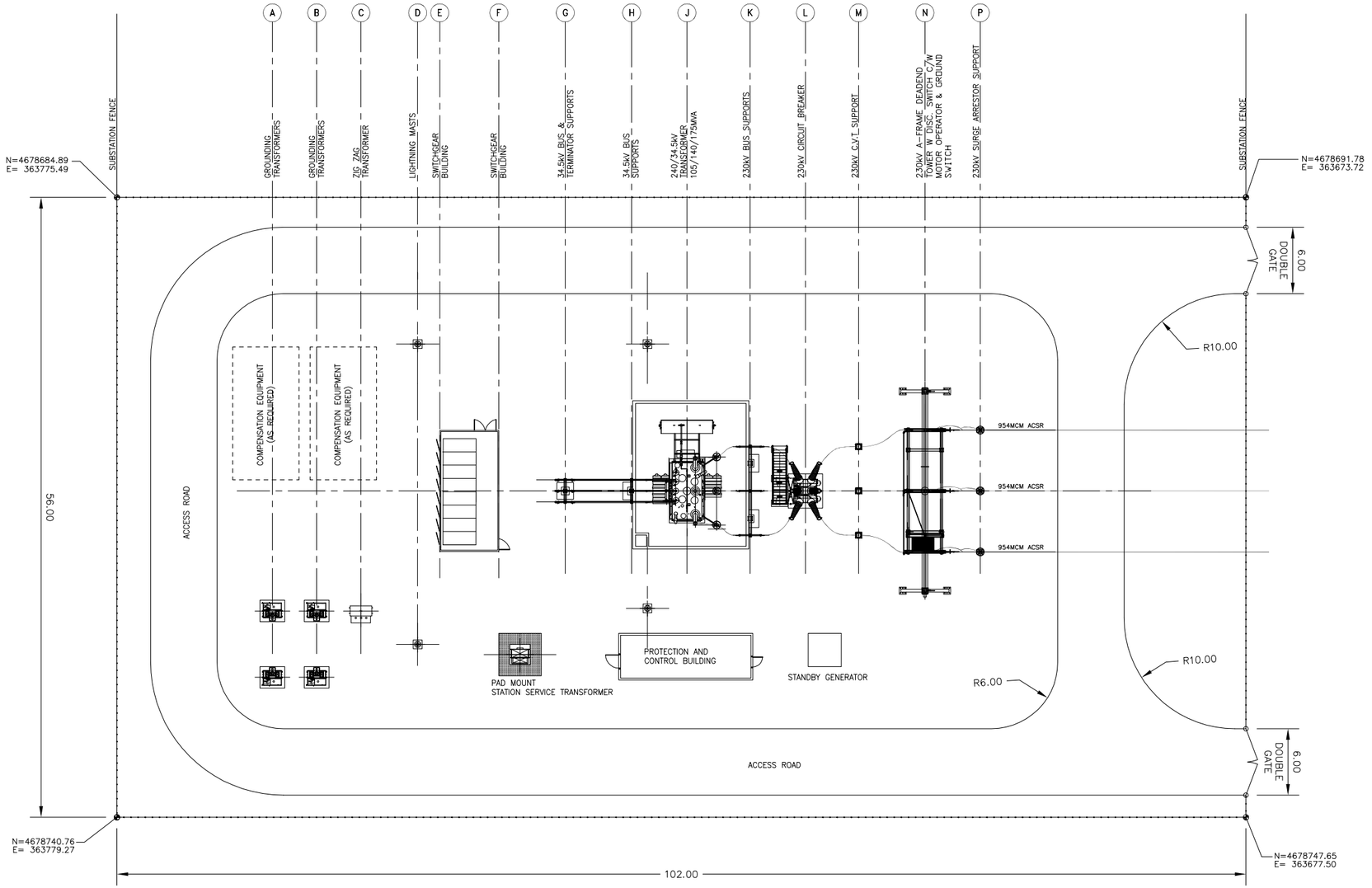
CLIENT DWG. NO.

DRAWING NO. 1523–P106A

REV. A

CADD FILE ADDRESS
1523–P106A–A

Joe Byrne Substation Layout Drawing



REV	D/M/Y	REVISION	DR	CHK	APP	APP	APP	APP
A	11/12/15	ISSUED FOR LTC APPLICATION	V.W.	E.K.				

ISS	D/M/Y	ISSUED FOR	APP
A	11/12/15	ISSUED FOR LTC APPLICATION	

REF	NUMBER	REFERENCES

STAMP/SEAL

APPROVED FOR CONSTRUCTION

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE

PROJECT NO.	ACTIVITY NO.	PACKAGE CODE

SCALE
N.T.S. (11"x17")

	BY	D/M/Y
DSN.	E.KWONG	04/12/15
DRN.	V.WONG	04/12/15

SAMSUNG

Pattern

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AREA
PATTERN ENERGY – BELLE RIVER
230 kV TRANSMISSION LINE

SUBJECT
BELLE RIVER WIND PROJECT
230kV/34.5kV SUBSTATION
STATION LAYOUT

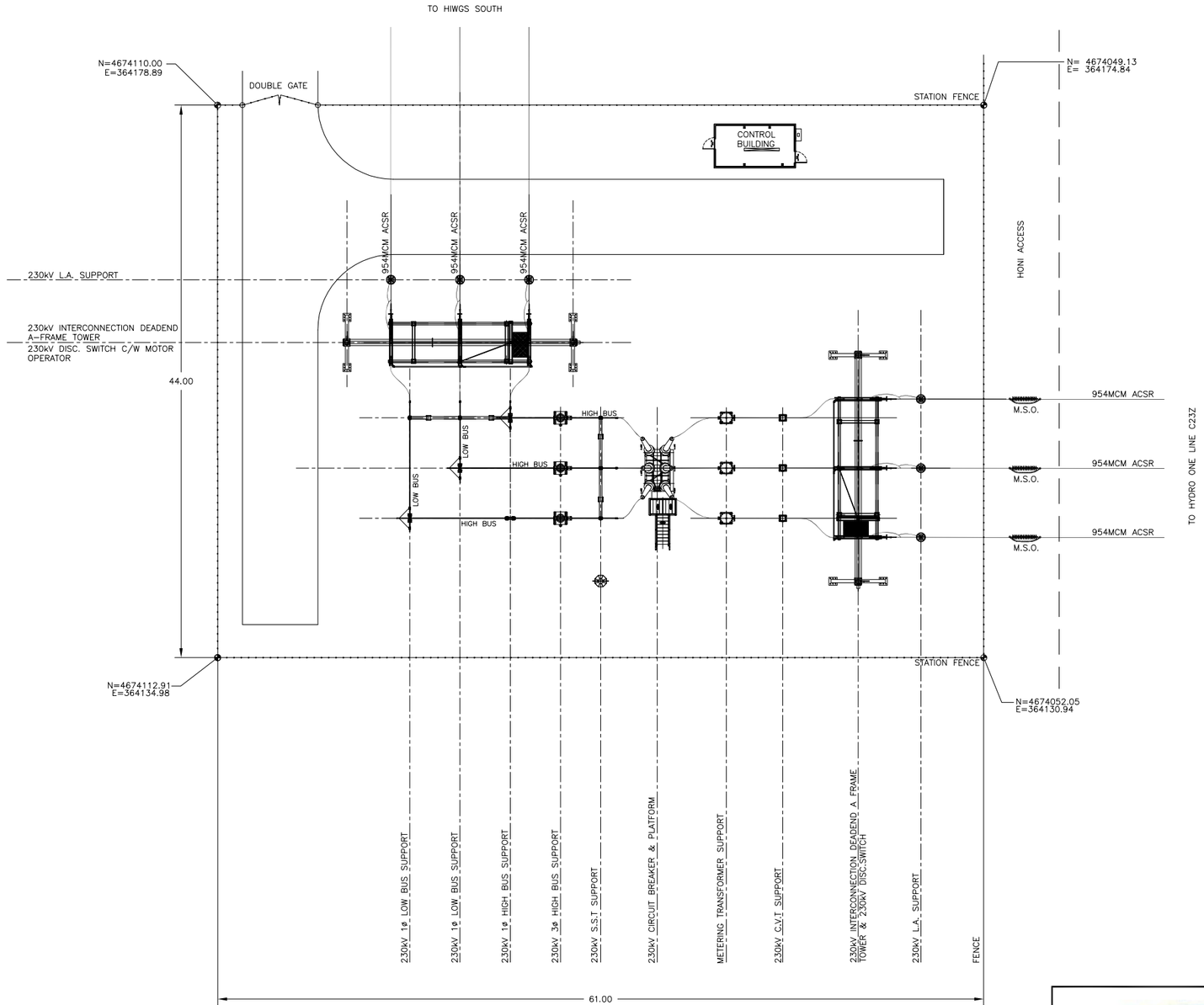
CLIENT DWG. NO.

DRAWING NO.
1523-E101

REV.
A

CADD FILE ADDRESS
1523-E101-A

Brody Switching Station Layout Drawing



REV	D/M/Y	REVISION	DR	CHK	APP	APP	APP	APP
A	11/12/15	ISSUED FOR LTC APPLICATION	V.W.	E.K.				

ISS	D/M/Y	APP	ISSUED FOR
A	11/12/15	APP	ISSUED FOR LTC APPLICATION

REF	NUMBER	REFERENCES
		TITLE

STAMP/SEAL

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APPROVED FOR CONSTRUCTION

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE

PROJECT NO. | ACTIVITY NO. | PACKAGE CODE

SCALE: N.T.S. (11"x17")

	BY	D/M/Y
DSN.	E.KWONG	04/12/15
DRN.	V.WONG	04/12/15

AREA: PATTERN ENERGY – BELLE RIVER 230 kV TRANSMISSION LINE

SUBJECT: BELLE RIVER WIND PROJECT 230kV SWITCHING STATION STATION LAYOUT

SAMSUNG

Pattern

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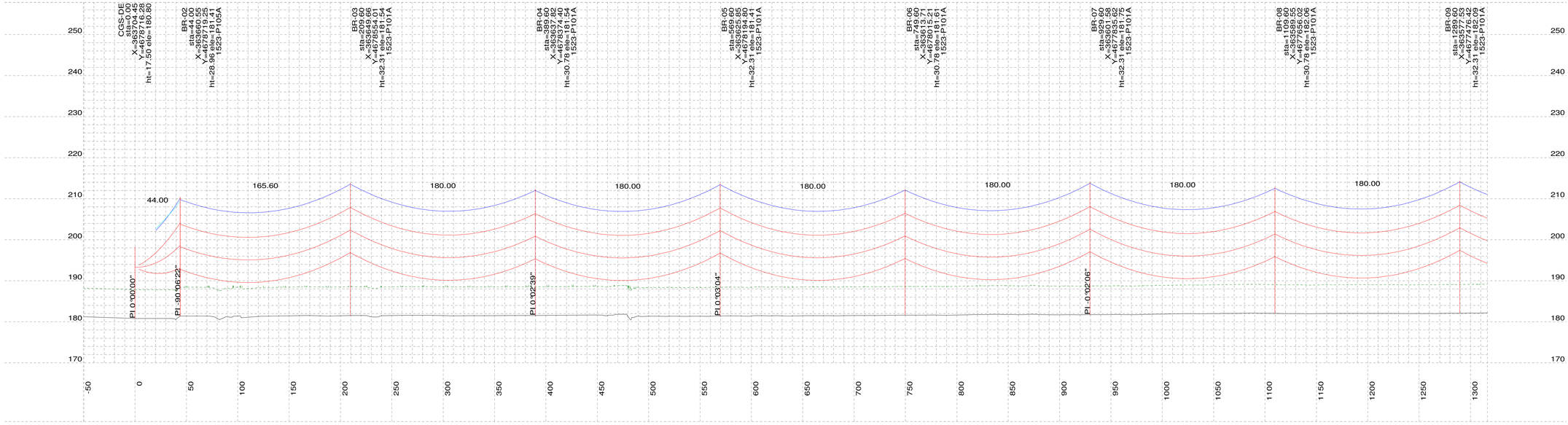
CLIENT DWG. NO.

DRAWING NO. 1523-E202 | REV. A

CADD FILE ADDRESS 1523-E202-A

Transmission Line Plan and Profile Drawings

PLS-CADD Drawing



PLAN & PROFILE LEGEND:

- 1 x 230kV TRANSMISSION LINE CONDUCTOR 954MCM ACSR RAIL
- OPGW
- OHGW
- GROUND CLEARANCE LINE

STRUCTURE DESCRIPTION LEGEND:

BR-03	STRUCTURE NO.
sta	STATION CHAINAGE
X	UTM EASTING
Y	UTM NORTHING
ht	STRUCTURE HEIGHT ABOVE GROUND (M)
ele	GROUND ELEVATION (M)
1523-P101A	FRAMING DRAWING NO.

NOTES:

1. GROUND CLEARANCE LINE SHOWN AT 7.0M (FOR VEHICULAR TRAFFIC).
2. CONDUCTOR (954MCM ACSR RAIL) SAG AT 75°C.
3. OPGW & OHGW SAG AT 50°C.
4. ALL DIMENSIONS ARE IN METERS U.N.O.

REV	DDMMYY	REVISION	DR	CHK	APP	APP	APP	APP	ISS	DDMMYY	APP	ISSUED FOR	REF	NUMBER	TITLE
B	10/12/15	ISSUED FOR LTC APPLICATION	T.L.	E.K.					B	10/12/15		ISSUED FOR LTC APPLICATION			
A	07/10/15	ISSUED FOR REVIEW	M.H	E.K.					A	07/10/15		ISSUED FOR REVIEW			

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE

AREA: PATTERN ENERGY - BELLE RIVER 230 kV TRANSMISSION LINE

PROJECT NO.	ACTIVITY NO.		BY	DDMMYY
		DSN	E.KWONG	07/10/15
		DRN	M.HUANG	07/10/15
		CHK		
		APP		

SCALE: N.T.S.

PACKAGE CODE:

SUBJECT: 1CCT 230kV TRANSMISSION LINE PLAN & PROFILE DRAWINGS SHEET 1 OF 6

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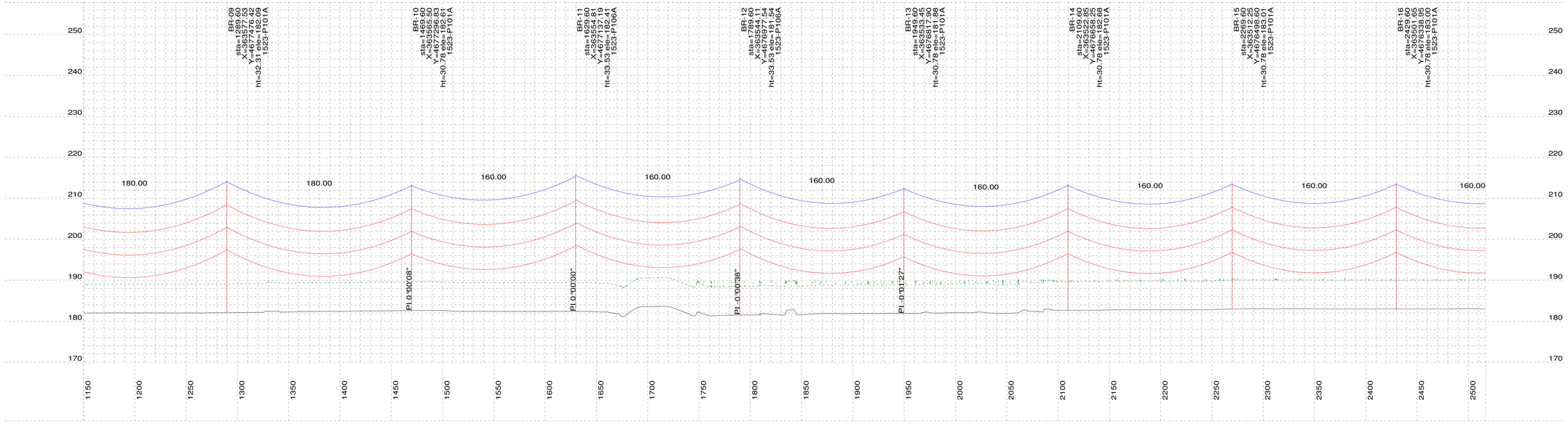
CLIENT DWG. NO.

DRAWING NO. 1523-P002-S01

REV. B

CAD FILE: PLS-CADD FILE: 1523-P002-A2

PLS-CADD Drawing



PLAN & PROFILE LEGEND:

- 1 x 230kV TRANSMISSION LINE CONDUCTOR 954MCM ACSR RAIL
- OPGW
- OHGW
- GROUND CLEARANCE LINE

STRUCTURE DESCRIPTION LEGEND:

BR-03	STRUCTURE NO.
sta	STATION CHAINAGE
X	UTM EASTING
Y	UTM NORTHING
ht	STRUCTURE HEIGHT ABOVE GROUND (M)
ele	GROUND ELEVATION (M)
1523-P101A	FRAMING DRAWING NO.

NOTES:

1. GROUND CLEARANCE LINE SHOWN AT 7.0M (FOR VEHICULAR TRAFFIC).
2. CONDUCTOR (954MCM ACSR RAIL) SAG AT 75°C.
3. OPGW & OHGW SAG AT 50°C.
4. ALL DIMENSIONS ARE IN METERS U.N.O.

REV	DDMMYY	REVISION	DR	CHK	APP	APP	APP	APP	ISS	DDMMYY	APP	ISSUED FOR	REF	NUMBER	TITLE
B	10/12/15	ISSUED FOR LTC APPLICATION	T.L.	E.K.					B	10/12/15		ISSUED FOR LTC APPLICATION			
A	07/10/15	ISSUED FOR REVIEW	M.H	E.K.					A	07/10/15		ISSUED FOR REVIEW			

STAMP/SEAL

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE

AREA: PATTERN ENERGY - BELLE RIVER 230 kV TRANSMISSION LINE

PROJECT NO. | ACTIVITY NO. | SCALE: N.T.S. | PACKAGE CODE

	BY	DDMMYY
DSN	E.KWONG	07/10/15
DRN	M.HUANG	07/10/15
CHK		
APP		

SUBJECT: 1CCT 230kV TRANSMISSION LINE PLAN & PROFILE DRAWINGS SHEET 2 OF 6

CLIENT DWG. NO.

DRAWING NO.: 1523-P002-S02 | REV.: B

Chimax Inc.
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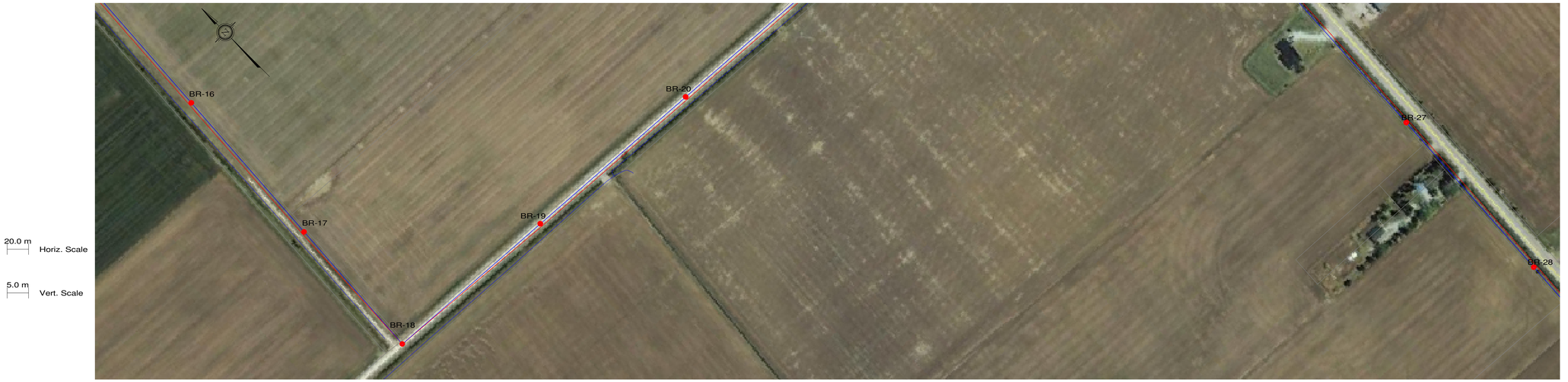
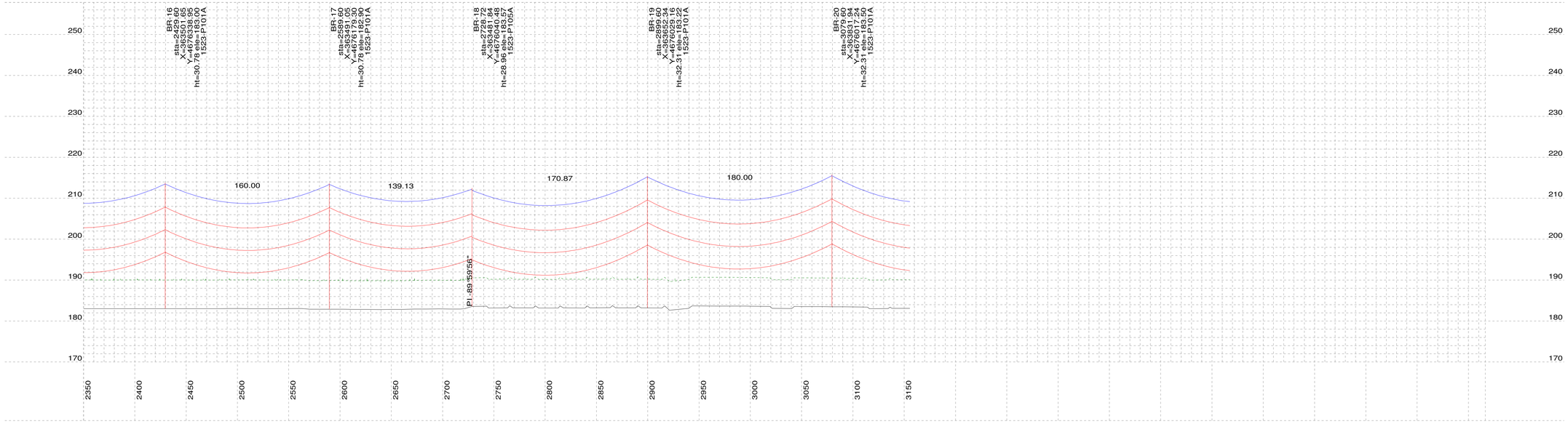
Markham, On., L3R 0A9
Email: chimax@chimax.ca

CAD FILE: PLS-CADD FILE: 1523-P002-A2

PLS-CADD Drawing





PLAN & PROFILE LEGEND:

- 1 x 230kV TRANSMISSION LINE CONDUCTOR 954MCM ACSR RAIL
- OPGW
- OHGW
- GROUND CLEARANCE LINE

STRUCTURE DESCRIPTION LEGEND:

BR-03	STRUCTURE NO.
sta	STATION CHAINAGE
X	UTM EASTING
Y	UTM NORTHING
ht	STRUCTURE HEIGHT ABOVE GROUND (M)
ele	GROUND ELEVATION (M)
1523-P101A	FRAMING DRAWING NO.

NOTES:

1. GROUND CLEARANCE LINE SHOWN AT 7.0M (FOR VEHICULAR TRAFFIC).
2. CONDUCTOR (954MCM ACSR RAIL) SAG AT 75°C.
3. OPGW & OHGW SAG AT 50°C.
4. ALL DIMENSIONS ARE IN METERS U.N.O.

REV	DDMMYY	REVISION	DR	CHK	APP	APP	APP	APP	ISS	DDMMYY	APP	ISSUED FOR	REF	NUMBER	TITLE
B	10/12/15	ISSUED FOR LTC APPLICATION	T.L.	E.K.					B	10/12/15		ISSUED FOR LTC APPLICATION			
A	07/10/15	ISSUED FOR REVIEW	M.H	E.K.					A	07/10/15		ISSUED FOR REVIEW			

SAMSUNG

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CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE

AREA: PATTERN ENERGY - BELLE RIVER 230 kV TRANSMISSION LINE

PROJECT NO. | ACTIVITY NO.

	BY	DDMMYY
DSN	E.KWONG	07/10/15
DRN	M.HUANG	07/10/15
CHK		
APP		

SUBJECT: 1CCT 230kV TRANSMISSION LINE PLAN & PROFILE DRAWINGS SHEET 3 OF 6

CLIENT DWG. NO.

SCALE: N.T.S.

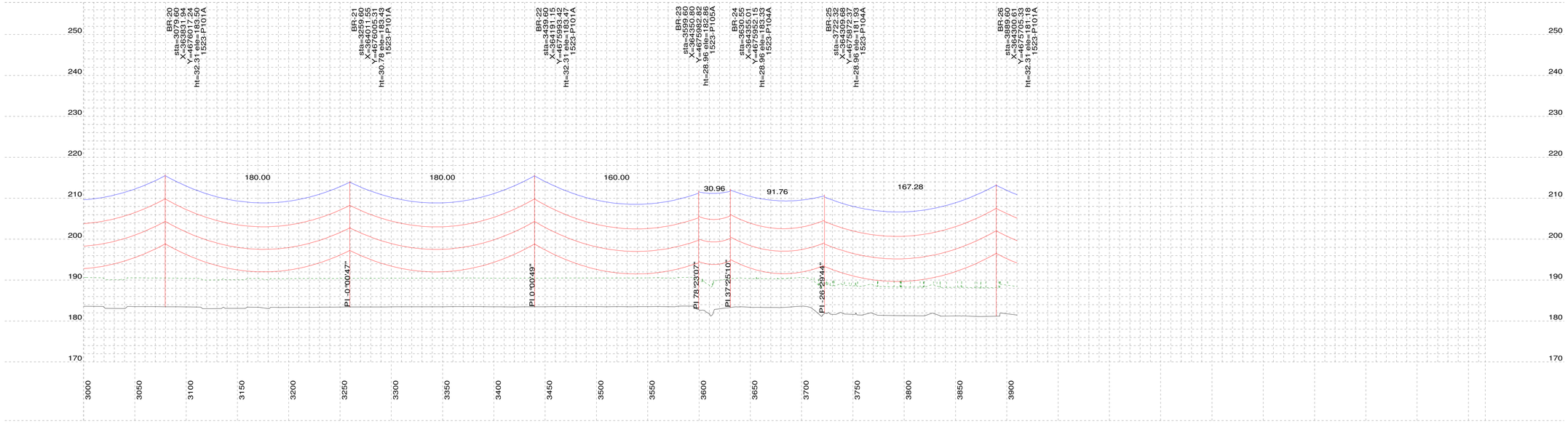
PACKAGE CODE

DRAWING NO.: 1523-P002-S03

REV.: B

CAD FILE: PLS-CADD FILE: 1523-P002-A2

PLS-CADD Drawing



PLAN & PROFILE LEGEND:

- 1 x 230kV TRANSMISSION LINE CONDUCTOR 954MCM ACSR RAIL
- OPGW
- OHGW
- GROUND CLEARANCE LINE

STRUCTURE DESCRIPTION LEGEND:

BR-03	STRUCTURE NO.
sta	STATION CHAINAGE
X	UTM EASTING
Y	UTM NORTHING
ht	STRUCTURE HEIGHT ABOVE GROUND (M)
ele	GROUND ELEVATION (M)
1523-P101A	FRAMING DRAWING NO.

NOTES:

1. GROUND CLEARANCE LINE SHOWN AT 7.0M (FOR VEHICULAR TRAFFIC).
2. CONDUCTOR (954MCM ACSR RAIL) SAG AT 75°C.
3. OPGW & OHGW SAG AT 50°C.
4. ALL DIMENSIONS ARE IN METERS U.N.O.

REV	DDMMYY	REVISION	DR	CHK	APP	APP	APP	APP	ISS	DDMMYY	APP	ISSUED FOR	REF	NUMBER	TITLE
B	10/12/15	ISSUED FOR LTC APPLICATION	T.L.	E.K.					B	10/12/15		ISSUED FOR LTC APPLICATION			
A	07/10/15	ISSUED FOR REVIEW	M.H	E.K.					A	07/10/15		ISSUED FOR REVIEW			

STAMP/SEAL

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE

AREA: PATTERN ENERGY - BELLE RIVER 230 kV TRANSMISSION LINE

PROJECT NO. | ACTIVITY NO. | SCALE: N.T.S. | PACKAGE CODE

	BY	DDMMYY
DSN	E.KWONG	07/10/15
DRN	M.HUANG	07/10/15
CHK		
APP		

SUBJECT: 1CCT 230kV TRANSMISSION LINE PLAN & PROFILE DRAWINGS SHEET 4 OF 6

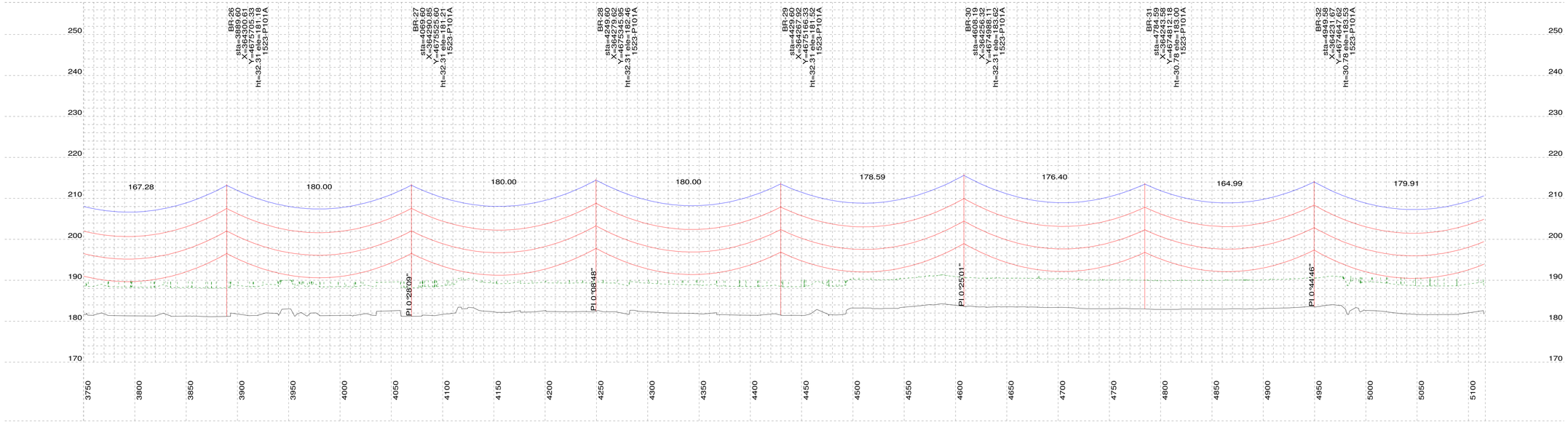
CLIENT DWG. NO.

DRAWING NO. 1523-P002-S04 | REV. B

Chimax Inc.
Engineering Company
3950 Fourteenth Ave. East, Suite 506
Markham, On., L3R 0A9
Email: chimax@chimax.ca

CAD FILE: PLS-CADD FILE: 1523-P002-A2

PLS-CADD Drawing



PLAN & PROFILE LEGEND:

- 1 x 230kV TRANSMISSION LINE CONDUCTOR 954MCM ACSR RAIL
- OPGW
- OHGW
- GROUND CLEARANCE LINE

STRUCTURE DESCRIPTION LEGEND:

BR-03	STRUCTURE NO.
sta	STATION CHAINAGE
X	UTM EASTING
Y	UTM NORTHING
ht	STRUCTURE HEIGHT ABOVE GROUND (M)
ele	GROUND ELEVATION (M)
1523-P101A	FRAMING DRAWING NO.

NOTES:

1. GROUND CLEARANCE LINE SHOWN AT 7.0M (FOR VEHICULAR TRAFFIC).
2. CONDUCTOR (954MCM ACSR RAIL) SAG AT 75°C.
3. OPGW & OHGW SAG AT 50°C.
4. ALL DIMENSIONS ARE IN METERS U.N.O.

REV	DDMMYY	REVISION	DR	CHK	APP	APP	APP	APP	ISS	DDMMYY	APP	ISSUED FOR	REF	NUMBER	TITLE
B	10/12/15	ISSUED FOR LTC APPLICATION	T.L.	E.K.					B	10/12/15		ISSUED FOR LTC APPLICATION			
A	07/10/15	ISSUED FOR REVIEW	M.H	E.K.					A	07/10/15		ISSUED FOR REVIEW			

REFERENCES

STAMP/SEAL

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE

AREA: PATTERN ENERGY - BELLE RIVER 230 kV TRANSMISSION LINE

PROJECT NO. | ACTIVITY NO. | SCALE: N.T.S. | PACKAGE CODE

	BY	DDMMYY
DSN	E.KWONG	07/10/15
DRN	M.HUANG	07/10/15
CHK		
APP		

SUBJECT: 1CCT 230kV TRANSMISSION LINE PLAN & PROFILE DRAWINGS SHEET 5 OF 6

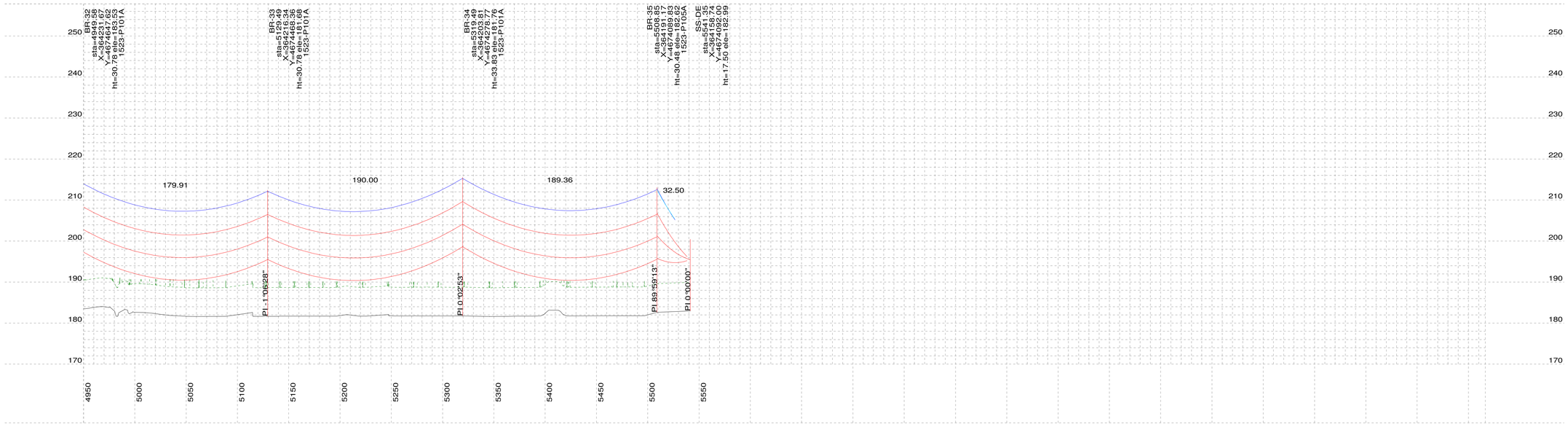
Chimax Inc.
Engineering Company
3950 Fourteenth Ave. East, Suite 506
Markham, On., L3R 0A9
Email: chimax@chimax.ca

CLIENT DWG. NO.

DRAWING NO. 1523-P002-S05 | REV. B

CAD FILE: PLS-CADD FILE: 1523-P002-A2

PLS-CADD Drawing



PLAN & PROFILE LEGEND:

- 1 x 230kV TRANSMISSION LINE CONDUCTOR 954MCM ACSR RAIL
- OPGW
- OHGW
- GROUND CLEARANCE LINE

STRUCTURE DESCRIPTION LEGEND:

BR-03	STRUCTURE NO.
sta	STATION CHAINAGE
X	UTM EASTING
Y	UTM NORTHING
ht	STRUCTURE HEIGHT ABOVE GROUND (M)
ele	GROUND ELEVATION (M)
1523-P101A	FRAMING DRAWING NO.

NOTES:

1. GROUND CLEARANCE LINE SHOWN AT 7.0M (FOR VEHICULAR TRAFFIC).
2. CONDUCTOR (954MCM ACSR RAIL) SAG AT 75°C.
3. OPGW & OHGW SAG AT 50°C.
4. ALL DIMENSIONS ARE IN METERS U.N.O.

REV	DDMMYY	REVISION	DR	CHK	APP	APP	APP	APP	ISS	DDMMYY	APP	ISSUED FOR	REF	NUMBER	TITLE
B	10/12/15	ISSUED FOR LTC APPLICATION	T.L.	E.K.					B	10/12/15		ISSUED FOR LTC APPLICATION			
A	07/10/15	ISSUED FOR REVIEW	M.H	E.K.					A	07/10/15		ISSUED FOR REVIEW			

STAMP/SEAL

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE

PROJECT NO. | ACTIVITY NO. | SCALE N.T.S. | PACKAGE CODE

	BY	DDMMYY
DSN	E.KWONG	07/10/15
DRN	M.HUANG	07/10/15
CHK		
APP		

AREA: PATTERN ENERGY - BELLE RIVER 230 kV TRANSMISSION LINE

SUBJECT: 1CCT 230kV TRANSMISSION LINE PLAN & PROFILE DRAWINGS SHEET 6 OF 6

Chimax Inc.
Engineering Company
3950 Fourteenth Ave. East, Suite 506
Markham, On., L3R 0A9
Email: chimax@chimax.ca

CLIENT DWG. NO.

DRAWING NO. 1523-P002-S06 | REV. B

CAD FILE: PLS-CADD FILE: 1523-P002-A2

OPERATIONAL DETAILS

To guide the operation and maintenance of the Wind Farm and the proposed Transmission Project, an operations and maintenance manual will be developed. The day-to-day operation of the Transmission Project, along with the Wind Farm, will be carried out by a dedicated team of operations staff that will be responsible for carrying out such activities. These staff will work during weekday regular business hours from an equipment/control building located within the Joe Byrne Substation and will be available during evenings and weekends (on-call) in order to be available on a 24/7 basis to respond to operational requests or emergencies. Operators will be trained and operating procedures will be established in accordance with guidelines published by the North American Electric Reliability Corporation ("**NERC**") and the Northeast Power Coordinating Council ("**NPCC**"), as well as with IESO requirements under the Market Rules.

Switching operations and any other operations requiring operator presence at the Brody Switching Station or elsewhere will be performed by a local operator that is capable of responding within the necessary timeframe as required by the Connection Agreement that the Applicant will enter into with Hydro One.

An IESO-compliant metering installation will be installed at the Brody Switching Station by a licensed Metering Service Provider. A metering plan based on this design will be submitted to the IESO as required under the Wind Farm's Power Purchase Agreement.

Day-to-day routine maintenance activities, such as snow clearing, vegetation control and clean-up will likely be provided by local contractors. Maintenance work on the 230 kV equipment will be contracted out to appropriately qualified contractors. For instance, testing of the 230 kV equipment will be contracted out to a suitable contractor qualified to do such work on high voltage lines, of which there are several that regularly do work in Ontario. With respect to emergency management and response, the Applicant will develop and implement a plan and related protocols based on the standard form of emergency plan used at all of the Applicant's partners' related facilities.

LAND MATTERS

1. Affected Landowners

There are two private landowners affected by the Transmission Project as follows:

a) Mr. [redacted] whose property is located on the east side of Lakeshore Road 125, north of Byrnedale Road in the Town of Lakeshore as illustrated by the map at Exhibit C, Tab 2, Schedule 1(ii). The legal description of this property is Part N1/2 Lot 16 Con 4 Rochester as in R993927 s/t an easement in gross over Parts 17, 18 Plan 12R-22393 as in CE237659 Town of Lakeshore being all of PIN 7503-0099(LT). The Joe Byrne Substation will be located on this property.

b) Mr. [redacted] whose property is located on the west side of French Line Road, as illustrated by the map at Exhibit C, Tab 2, Schedule 1(ii). The legal description of this property is Part N1/2 LT 10 Con SMR Rochester as in R978316; S/T Debts in R978316; S/T Reservations in R978316; S/T RO14393; Lakeshore being all of PIN 750540114. The Brody Switching Station will be located on this property.

2. Land Rights

In respect of the Joe Byrne Substation and the Brody Switching Station, the Applicant has entered into Option Agreements (to lease) with each of the two landowners on which these facilities will be located. When the Applicant exercises its options under the Option Agreements, the Applicant and the landowners will enter into binding Lease Agreements. The forms of both the referenced Option Agreement and the Lease Agreement are at Exhibit E, Tab 1, Schedule 2.

In regard to the Transmission Line, the Applicant is close to finalizing a Road Use Agreement with the Town of Lakeshore. The Road Use Agreement will include terms and conditions that are customary for such agreements, including road repair, infrastructure placement and coordination obligations. The Applicant is also entering into discussions regarding a Road Use Agreement with the County of Essex.

Land-Related Forms

CONFIDENTIAL

OPTION AGREEMENT

(Substation and Interconnection Facilities)

THIS AGREEMENT is made as of the _____ day of _____, 2015 (hereinafter referred to as the "**Effective Date**")

B E T W E E N:

SP BELLE RIVER WIND LP, by its general partner, **SP BELLE RIVER WIND GP INC.**
(hereinafter referred to as "**SP**")

- and –

■
(**[collectively]** hereinafter referred to as the "**Property Owner**")

(SP and the Property Owner may be herein collectively referred to as the "**Parties**")

WHEREAS SP is in the process of the development of a wind energy generation project on lands in the vicinity of the Property known as the "Belle River Wind Project" (the "**Project**");

AND WHEREAS the Property Owner is the sole registered legal and beneficial owner of the lands and premises legally described as:

■

(the "**Property**")

AND WHEREAS SP is considering the suitability of the Property for the construction, operation and maintenance of one or more electrical transmission substations and operations and maintenance buildings (including related overhead and underground collection and transmission cables, transmission interconnection facilities, access roads, buried foundations and any ancillary and related equipment, fixtures and infrastructure) (collectively, the "**Substation**");

AND WHEREAS SP and the Property Owner have agreed to enter into this Agreement for the purpose of granting to SP an exclusive option to acquire a lease over all or a portion of the Property for the purposes and on the terms and conditions set out herein.

NOW THEREFORE THIS AGREEMENT WITNESSETH that in consideration of the mutual covenants and obligations contained herein and other good and valuable consideration the receipt and sufficiency of which is hereby acknowledged, the Parties covenant and agree as follows:

1. OPTION AND COMPENSATION

1.1 Subject to the terms and conditions set out herein, the Property Owner hereby grants SP an option to acquire a lease for the purposes of developing, constructing, operating, maintaining and decommissioning the Substation and related equipment and appurtenances on the Property (the "**Option**"), which option may be exercisable by SP in its sole and absolute discretion in accordance with the terms set forth in Section 1.2. Upon exercise of the Option by SP pursuant to Section 1.2, the Property Owner shall duly execute and deliver such lease in the form attached hereto as *Schedule "A"* upon the terms and conditions provided therein (the "**Lease**").

1.2 The Option is exercisable by SP in its sole and absolute discretion and may be exercised by SP by a notice in writing delivered to the Property Owner at any time during a period commencing on the Effective Date and expiring on the ____ day of _____, 2019 (the "**Option Term**").In connection with the delivery of written notice for the exercise of the Option pursuant to this Agreement, SP shall deliver a reference plan or surveyor's sketch delineating the location and dimensions of the Property subject to the Lease (the "**Leased Lands**").

1.3 In consideration of the Option granted herein, SP shall make an annual payment to the Property Owner in an amount of which is calculated at _____ (the "**Option Fee**") which shall be payable in advance on the Effective Date and on each anniversary thereof during the Option Term.

2. COVENANTS, REPRESENTATIONS AND WARRANTIES

2.1 (a) The Property Owner hereby represents and warrants that it is the legal and beneficial owner in fee simple of the Property with good and marketable title thereto free of all encumbrances subject only to:

(i) the oil and gas lease[s] described in subsection(b) below (the "**Oil and Gas Lease[s]**"); and

(ii) [List any other registered encumbrances]

and that the Property Owner has the legal right and authority to grant the Lease to SP and has not and will not grant a lease, conveyance, easement or any other property right, including any petroleum or natural gas lease, related to the Property to any other person that would interfere with the rights granted to SP hereunder. In determining whether any subsequent interest interferes with rights granted to SP, the parties shall evaluate the matter acting reasonably.

(b) The following is a description of the Oil and Gas Lease[s]:

(i) ■

SP shall, prior to exercising the Option, consult with the holders of the "**Oil and Gas Lease[s]**" and SP and the Property Owner shall use commercially reasonable efforts to resolve any issues that may arise out of the exercise of the Option vis-à-vis the Oil and Gas Lease[s] with the goal of ensuring that the Oil and Gas Lease[s] and the Lease can both exist over the Property.

(c) The Property Owner hereby represents and warrants that there are no unregistered encumbrances affecting the Property and, further, that it has not granted any options or leases respecting the Property other than the Option.

2.2 The Property Owner further hereby represents and warrants that **[each person executing this Option Agreement is at least eighteen (18) years of age and, within the meaning of the *Family Law Act* (Ontario) confirms that]/[, as of the date hereof, no part of the Property is occupied as a family residence or 'matrimonial home', and the ownership of a share, or an interest in a share, of the Property Owner does not entitle a shareholder to occupy a housing unit on the Property.] [NTD: If Property Owner is a company delete paragraphs (a) to (g).]**

(a) the Property Owner is not a spouse; or

(b) the Property is not ordinarily occupied by the Property Owner and his/her spouse, who is not separated from the Property Owner as their family residence; or

(c) the Property Owners are spouses of one another and are both parties to this Agreement; or

(d) the Property Owner is separated from his/her spouse and the Property was not ordinarily occupied by them at the time of their separation as their family residence; or

(e) _____ is the spouse of the Property Owner. The Property Owner's spouse has consented to this transaction, including the execution of this Agreement, in accordance with the form of Consent of Spouse attached as Schedule "E" hereto; or

(f) the Property is not designated under the *Family Law Act* as a matrimonial home by the Property Owner and his/her spouse, but there is such a designation of another property as our matrimonial home which has been registered and which has not been cancelled; or

(g) The Property Owner's spouse has released all rights under the *Family Law Act* by a separation agreement.

[Note: Delete or cross out the statements which are inapplicable]

2.3 The Property Owner has sought and received independent legal advice in respect of this Agreement as evidenced by the execution of a Certificate of Independent Legal Advice in the form attached hereto as *Schedule "C"*, understands the nature and consequences of the Agreement and is signing it voluntarily.

2.4 The Property Owner hereby agrees and covenants subsequent to the execution and delivery of this Agreement and without any additional consideration to execute and deliver or cause to be executed and delivered any further legal instruments, including, without limitation, (i) executing any required consents, performing any acts which are or may become necessary to effectuate the purposes of this Agreement and completing the transactions contemplated hereunder, and (ii) executing the "Appointment and Authorization of Agent" (the "**Agency Form**") in the form attached hereto as *Schedule "D"*.

2.5 Upon receipt of copies of the underlying legal bills, SP shall pay for any of the Property Owner's legal expenses up to a maximum amount of _____ that are associated with (i) the execution and delivery of any further legal instrument referred to in Section 2.4, (ii) the performance of any function further to this Agreement or to the Lease attached hereto requested by SP to the Property Owner that would typically require legal counsel, (iii) the review of correspondence from SP to the Property Owner regarding this Agreement that would reasonably require input by legal counsel, and(iv) the actual review and negotiation of this Option Agreement, subject to such legal bills reflecting commercially reasonable rates and billing time given the task at hand and subject to SP having the ability, in its sole discretion, to have the bills assessed by an Assessment Officer of the Ontario Superior Court of Justice (or equivalent thereof). The Property Owner acknowledges that it is free to consult legal counsel to the full extent it chooses to do so, however the maximum obligation of SP with respect to any such legal expenses shall not exceed the maximum amount stated in this Section 2.5.

2.6 The Property Owner specifically acknowledges that a title search has not been conducted on the Property and that SP is entering into this Agreement on the basis of the representations and warranties provided by them hereunder and in particular those provided in Section 2.1. If, after the Effective Date, SP conducts a title search and such search reveals, in SP's sole opinion acting reasonably, that the Property Owner is not the legal and beneficial owner of the Property or does not have the legal right and authority to grant to SP, its servants, agents, consultants, contractors and sub-contractors the right to access the Property or has granted an easement or other property right related to the Property (a "**Prior Encumbrance**") to any other person that would interfere with the rights granted to SP hereunder, SP may, in its sole discretion, terminate this Agreement upon written notice at any time thereafter, which termination shall be in addition to and not in substitution for such other remedies as SP may have in the circumstances.

2.7 If the title search reveals a Prior Encumbrance, SP, in its sole discretion, without prejudice to all of its rights and remedies pursuant to this Agreement, may consult with the holders of such Prior Encumbrance and the Property Owner shall use commercially reasonable efforts to resolve any issues that may arise out of the grant of the Option and the exercise thereof vis-à-vis the Prior Encumbrance with the goal of determining whether the Prior Encumbrance and the Lease can both exist over the Property. Without limitation, the Property Owner shall, if requested by SP, use its commercially reasonable efforts to assist SP in obtaining any postponement agreement that SP, acting reasonably, may require postponing the Prior Encumbrance in favour of the rights and interests of SP pursuant to this Option Agreement and the Lease to be granted pursuant hereto.

2.8 Following the title search, SP may decide, acting reasonably, to amend this Agreement and the Schedules hereto to reflect the results thereof. In such event, the Property Owner covenants to execute such amendment or other document as SP or its solicitors, in their sole discretion, deem necessary in order to give effect to this Agreement.

2.9 Notwithstanding any steps that SP may have taken pursuant to Section 2.6 or 2.7, SP may choose to terminate this Agreement at any time pursuant to Section 3.1(b), which termination shall be in addition to and not in substitution for such other remedies as SP may have in the circumstances.

2.10 The Property Owner acknowledges that SP, its agents or appointees, may need to enter on to the Property during the term of this Option but prior to the exercise thereof, for the purposes of conducting environmental and archaeological investigations, including the right to conduct drilling to assess certain geotechnical conditions relevant to the operation of the Substation (the "**Assessment Activities**") and the Property Owner hereby grants permission to SP, its agents or appointees, to access to the Property for the purposes of conducting such Assessment Activities. The Assessment Activities may include, but are not limited to, the drilling of boreholes for the purposes of assessing soil stability. SP does not anticipate any material damage to the Property resulting from the Assessment Activities, but agrees to compensate the Property Owner for any documented crop loss or other damages and losses that may result directly therefrom.

3. TERMINATION

3.1 Except as otherwise stipulated herein, this Agreement shall terminate at the earlier of:

(a) failure by SP to pay the requisite payments provided for hereunder within sixty (60) days of receipt of written notice of default from the Property Owner, unless otherwise agreed to by the Parties;

(b) receipt by the Property Owner of written notice from SP of SP's election to terminate the Agreement, which SP may elect to deliver in its sole and absolute discretion at any time;

(c) termination by SP pursuant to Section 2.6; or

(d) at the expiry of the Option Term.

For greater certainty, the exercise of the Option shall not result in the automatic termination of this Agreement.

3.2 The representations, warranties, covenants and agreements contained in Article 2.0 hereof shall survive the exercise of the Options or the termination of this Agreement, as applicable, and shall remain in full force and effect.

3.3 In the event that SP terminates this Agreement pursuant to Section 2.6 or Section 2.9, or exercises the Option pursuant to Section 1.2, the consideration payable by SP in the year that the Agreement is terminated, shall be prorated on a per diem basis to the date of the notice of termination delivered pursuant to Section 2.6 or Section 2.9 as the case may be, and SP may withhold or deduct any amounts owing or payable to Property Owner under the lease agreement or any other agreement related to the Option.

4. NOTICES

4.1 Any notice or other writing required or permitted to be given under this Agreement or for the purposes of this Agreement, including an agreement to be delivered pursuant to Section 5.3(c), (referred to in this Section as a "**notice**") to the other Party shall be sufficiently given if delivered personally, or if sent by prepaid registered mail or if transmitted by fax or other form of recorded communication tested prior to transmission to such other Party:

In the case of notice to SP, to:

SP Belle River Wind LP
c/o Samsung Renewable Energy Inc.
2050 Derry Road West, 2nd Floor
Mississauga, ON
L5N 0B9
Attention: President
Fax: (905) 285-1852

With a copy to:

c/o Pattern Energy Group LP
355Adelaide Street West, Suite 100
Toronto, ON
M5V 1S2
Attention: Legal Counsel
Fax: (416) 979-8428

In the case of the Property Owner, to:

■[Name and Address of Property Owner]

Tel: (■) ■
Fax: (■)■

or in each case at such other address as the Party to whom such writing is to be given shall have last notified to the Party giving the same in the manner provided in this Section. Any notice personally delivered to the Party to whom it is addressed as provided in this Section shall be deemed to have been given and received on the day it is so delivered at such address, provided

that if such day is not a Business Day then the notice shall be deemed to have been given and received on the Business Day next following such day. Any notice mailed to the address and in the manner provided for in this Section shall be deemed to have been given and received on the fifth Business Day next following the date of its mailing in Ontario. Any notice transmitted by fax shall be deemed to have been given and received on the first Business Day after its transmission.

For the purposes of this Section, the term "Business Day" means every day except Saturdays, Sundays and statutory holidays in the Province of Ontario.

5. GENERAL PROVISIONS

5.1 This Agreement shall be governed by the laws of the Province of Ontario and the federal laws of Canada applicable therein.

5.2 All matters in dispute between the Parties pursuant to this Agreement shall be determined by arbitration in accordance with this Section. In the event of a dispute with respect to any matter within the purview of this Agreement, one of the Parties may serve upon the other Party a notice requesting that the Parties proceed to arbitration (the "**Arbitration Notice**"). Upon receipt of an Arbitration Notice, the Parties shall have ten (10) days from the date of receipt of the notice to agree upon an arbitrator who is an attorney, engineer, or energy industry executive having expertise in the subject area of the matters, but not the matters themselves, giving rise to the dispute that is the subject of the arbitration. If the Parties are unable to agree on an arbitrator within that time-period, each Party shall appoint a single arbitrator and the two chosen arbitrators shall designate a third arbitrator. *Schedule "E"* sets out the arbitration procedure applicable to any arbitration under this Agreement.

5.3 (a) Subject to Section 5.3(c) below, the Property Owner shall be able to assign this Agreement without the consent of SP to a purchaser of the Property, and shall also be able to mortgage and/or charge the Property to any person(s) or corporation(s). SP shall promptly execute and deliver any consent, confirmation or acknowledgement, or other documentation, reasonably requested by such Mortgagee or Chargee, provided that the execution of any such document does not affect the priority of SP's rights created in this or any other agreement entered into between the Property Owner and SP herein. In any event, in connection with any sale of the Property, this Agreement shall be deemed to attach to and run with the land and the subsequent owner of the Property shall be bound by and subject to this Agreement.

(b) Subject to subsection 5.3(c) below, SP shall be able to assign this Agreement without the consent of the Property Owner to any persons, including but not limited to its lender(s) as security for SP's obligations to such lender(s), Hydro One Networks Inc. ("**HONI**"), and the local electricity distribution company servicing the Town of Lakeshore and the Project (and any of their respective affiliates).The Property Owner shall promptly execute and deliver any consent, confirmation and acknowledgement, or other documentation, reasonably requested by SP, any lender or assignee. For greater certainty, SP shall be entitled to assign this Agreement as to all or a portion of the rights and interests pursuant to this Agreement.

(c) No assignment by either SP or the Property Owner shall be effective unless and until the assignee executes and delivers to the other party an agreement in favour of such other party (without the need for any other party to execute that counterpart) agreeing to be bound by this Agreement and the terms hereof to the same extent as if it had been an original party hereto, and SP or Property Owner (as applicable) shall undertake commercially reasonable efforts to cause a proposed assignee to execute and deliver such assignment and assumption agreement. Upon the assignee (other than an assignment to a lender) executing such agreement to be bound, SP or the Property Owner, as the case may be, shall be released from any obligations or liabilities it may have had hereunder from and after the date of such assignment without any further documentation being required.

5.4 The Property Owner acknowledges, in conjunction with any exercise of the Option by SP, that further grants of easements and rights-of way may be necessary to permit the installation and connection of power lines, access roads, and related apparatus and communication facilities by HONI, or any other distributor or transmitter, to the facilities and equipment of SP on the Leased Lands. The Property Owner covenants and agrees that it will promptly grant to HONI or any other distributor or transmitter all appropriate and required easements and rights-of-way so as to permit the installation of any and all such power lines, access roads, and related apparatus and communication facilities by HONI or such distributor or transmitter and to permit the required

connections to be made to enable SP to conduct its operations on the Leased Lands in furtherance of SP's use and enjoyment of such Leased Lands.

5.5 This Agreement shall be binding upon and enure to the benefit of the Parties hereto, their respective heirs, executors, administrators and other legal representatives and, to the extent permitted hereunder, their respective successors and permitted assigns.

5.6 SP shall be entitled, at its cost and expense, to register this Agreement or a notice thereof and any required reference plans, in the applicable land registry office having jurisdiction over the Property, and the Property Owner agrees to execute, at no cost to the owner, all necessary instruments, plans and documentation for this purpose.

5.7 If any provision of this Agreement is determined to be invalid or unenforceable in whole or in part, such invalidity or unenforceability shall attach only to such provision (or part thereof) and everything else in this Agreement shall continue in full force and effect.

5.8 No change or modification of this Agreement shall be valid unless it is in writing and signed by each Party hereto.

5.9 This Agreement constitutes the entire agreement between the Parties hereto with respect to the subject matter of this Agreement. The Parties hereto acknowledge that there is no representation, warranty, and agreement or understanding between them, whether express or implied, which has induced any of the Parties hereto to enter into this Agreement except as expressly stated herein.

5.10 No failure on the part of any Party to exercise, and no delay by any Party in exercising, any right under this Agreement shall operate as a waiver of such right, unless the Party gives written notice to the other Party of its intention to waive such right.

5.11 This Agreement shall commence on the Effective Date.

5.12 Time shall be of the essence of this Agreement.

5.13 The Section headings herein have been inserted for ease of reference only and shall not affect the construction or the interpretation of this Agreement.

5.14 This Agreement may be executed in several counterparts, each of which so executed shall be deemed to be an original, and such counterparts together shall constitute but one and the same instrument.

5.15 Delivery of this Agreement by facsimile transmission or electronic PDF via e-mail shall constitute valid and effective delivery. Upon request, SP and Property Owner shall provide the other party with original signature pages to this Agreement.

5.16 Any monies to be paid pursuant to this Agreement shall be in Canadian funds.

5.17 The Parties shall execute and deliver such other and further instruments, documents, or papers and perform all such acts reasonably necessary or proper to carry out and effectuate the terms of this Agreement as may be reasonably requested by either Party.

[Remainder of page is left intentionally blank]

IN WITNESS WHEREOF the Parties hereto have executed this Agreement on the date first above written.

SP BELLE RIVER WIND LP, by its general partner, **SP BELLE RIVER WIND GP INC.**

Name:
Title:

Name:
Title:

We have the authority to bind the corporation

Witness
Name:
Address:

Witness
Name:
Address:

CONFIDENTIAL

SCHEDULE "A" to Option Agreement

FORM OF LEASE

(Substation and Interconnection Facilities)

THIS GRANT OF LEASE
is made with effect as of the ■ day of ■ 201[•] (the "Effective Date")

BETWEEN:

■[Name]
[Address]

(hereinafter called the "**Grantor**")

AND:

[SP BELLE RIVER WIND GP INC.], an Ontario corporation

(hereinafter called the "**Grantee**")

WHEREAS the Grantor is the registered owner(s) of an estate in fee simple composed of the lands described in *Schedule "A-1"* hereto (the "**Property**").

AND WHEREAS pursuant to an Option Agreement dated _____, 2015(notice of which is registered on title as Instrument No. _____ on _____, 2015) (the "**Option**") the Grantor granted to the Grantee the right, title and option to acquire a leasehold interest in respect of the Property or portion thereof.

NOW THEREFORE, in consideration of the compensation described in Section 6 hereof, and in consideration of the covenants and conditions hereinafter contained to be kept and performed by the Grantor and the Grantee, the Grantor grants, demises and leases unto the Grantee, free from all encumbrances and restrictions (other than the encumbrances listed in *Schedule "B"* hereto), and Grantee hereby accepts such grant, demise and lease for exclusive use by the Grantee of that portion of the Property more particularly described in *Schedule A-2*attached hereto (hereinafter the "**Leased Lands**"). The Lease includes the unobstructed and exclusive right, liberty and privilege to use Leased Lands for the erection, installation, re-installation, construction, operation, maintenance, inspection, patrol, removal, replacement, reconstruction, relocation, enlargement and repair at all times of one or more electrical transmission substations, operations and maintenance buildings (including related overhead and underground collection and transmission cables, transmission interconnection facilities, access roads, buried foundations and any ancillary and related equipment, fixtures and infrastructure) (collectively, the "**Substation**"), and all related equipment and appurtenances or accessories thereto as may be necessary or convenient in connection therewith for the generation, transmission, distribution or conveyance of electrical energy, together with the rights of ingress to and egress from the Easement Lands for all purposes incidental to this grant and for the purpose of constructing, reconstructing, repairing, replacing, relocating and protecting its Works (as hereinafter defined), effective from the date hereof and for the term hereof on the following terms and conditions:

1. **Definitions**

In this Lease:

(a) "**Construction Financing**" means the completion of the first occurrence of substantial funding to the Grantee of the initial principal loan amounts from third-party project lenders (excluding any funding of preliminary development costs, expenses and fees) for the purpose of funding the costs, expenses and fees incurred in connection with the development, design, engineering, planning, procurement and construction of the Wind Farm (which date shall be determined by the Grantee in its sole and absolute discretion);

(b) "**CPI**" or "**Consumer Price Index**" means the Consumer Price Index (All items for Ontario, base year 2002 = 100) published by Statistics Canada (or by a successor or other governmental agency, including a provincial agency), or (b) if the CPI is no longer published, an index published in substitution for the CPI or any replacement index designated by the Grantee with the consent of the Grantor. If a substitution is required, the Grantee will make the necessary conversions. If the base year for the CPI (or the substituted or replacement index) is changed by Statistics Canada (or by its successor or other governmental agency) the Grantee will make the necessary conversions;

(c) "**Lease**" means this grant of lease, together with all schedules attached hereto, as it may be amended, modified or restated from time to time;

(d) "**Secured Creditor**" means any person to whom the Grantee grants as security a mortgage, charge or other security on all or a portion of the Wind Farm, and/or the rights of the Grantee pursuant to this Lease; and

(e) "**Wind Farm**" means the wind farm known as the Belle River Wind Farm consisting of wind turbine generators, collection and transmission lines, access roads, the Substation (and other works) to be constructed by the Grantee on private and public lands located in the Town of Lakeshore, Ontario.

2. **The Works**

The rights and privileges hereby granted shall include, without limiting the generality of the foregoing, the right to erect, install, construct, operate, maintain, inspect, patrol, remove, replace, reconstruct, relocate, alter, repair and decommission on the Leased Lands, the Substation, transmission interconnection facilities, and all related equipment, apparatus, accessories, works or appurtenances thereto, including, but not limited to, access roads, permanent crane pads, any electricity transmission or distribution lines or cabling and transformer boxes and any related equipment, apparatus, accessories, works or appurtenances thereto, and whether above or below grade (hereinafter collectively called the "**Works**") as the Grantee may deem necessary for the full enjoyment of any or all of the rights and privileges herein granted.

3. **General Rights of the Grantee**

(a) The Grantee (including its successors and assigns), its tenants, officers, agents, servants, employees, contractors, licensees, together with their vehicles, tools, equipment, apparatus and materials of whatsoever nature and kind, shall have the full, free and uninterrupted right to enter upon, use and occupy the Leased Lands for all purposes connected with, or incidental to, the rights and privileges herein granted including, without limitation, the right to load, unload and store material, apparatus and equipment, including, but not limited to, heavy equipment, upon the Leased Lands, to make and keep the Leased Lands free from bush, trees, growths and water and to enter on the Grantor's abutting lands, if any, to remove or trim any trees immediately adjacent to the Leased Lands which, in the reasonable opinion of the Grantee which determination will not be made without prior consultation with the Grantor, may constitute a hazard to the Works and other obstructions that, in the reasonable opinion of the Grantee, may endanger the Works.

(b) Where the Grantee reasonably considers it necessary by reason of the nature or condition of the Leased Lands or the circumstances then existing, the Grantee shall have the right and license, at no additional cost, to go on, across and exit from all or any part of the Grantor's abutting lands whether by the Grantor's access routes or otherwise for the purposes of gaining access to the Leased Lands and the Works and for the purpose of constructing, reconstructing, repairing, replacing, relocating or protecting its Works; provided however, in exercising such rights, the Grantee shall abide by all reasonable safety precautions.

(c) Where the Grantee reasonably considers it necessary by reason of the nature or condition of the Leased Lands or the circumstances then existing, the Grantee shall have the right to obtain, at no additional cost, one or more easements over one or more portions of the Grantor's abutting lands for the purposes of drainage of accumulated water from the Leased Lands over and across the Grantor's abutting lands. The Grantor agrees to grant and execute in favour of the Grantee any such drainage easements which the Grantee, acting reasonably, advises that the same are necessary for the safe and efficient drainage from the Leased Lands in compliance with applicable laws. The Grantee shall pay for upgrades or expansions to existing drainage tile and related infrastructure which are necessary solely as a result of the Grantee's activities on the Leased Lands.

4. **Term**

The term of the Lease shall commence on the date hereof (the "**Commencement Date**") and shall run for a term of forty (40) years (the "**Term**"), subject to early termination in accordance with Sections 25 and 26.

5. **Planning Act Compliance**

Nothing herein is intended to cause or create, or shall be construed as causing or creating, a subdivision of the Leased Lands in contravention of the *Planning Act* (Ontario) and this Lease is entered into subject to the condition that it is to be effective only if the provisions of Section 50 of the *Planning Act* (Ontario) are complied with. The Grantee hereby declares, and the Grantor acknowledges, that the Term of this Lease cannot exceed 50 years and that this Lease has been acquired by the Grantee for the purpose of renewable energy project within the meaning of the *Green Energy Act*, 2009.

6. **Compensation**

(a) In full and final consideration of the Lease granted hereunder, the Grantee shall pay to the Grantor the following amounts:

(i)

(ii)

(iii)

(iv)

(b)

(c)

(d) All payment obligations of the Grantee to Grantor as described in this Agreement shall be paid no later than sixty (60) days following the date such payment obligation accrued.

7. **Studies and Tests**

(a) The rights, privileges and leases hereby granted shall include, without limiting the generality of the foregoing, the right to conduct all engineering, legal surveys and make soil tests, soil compaction and environmental studies and audits in, under, on or over the Leased Lands as the Grantee in its sole discretion considers appropriate and at the Grantee's sole cost and expense. Legal surveys and other tests relevant to the Grantor's use of the Leased Lands (other than information the Grantee considers proprietary) shall be made available to the Grantor upon completion at no cost to the Grantor.

(b) The Grantee shall be responsible for restoring the Leased Lands to the original condition (in so far as reasonably possible) after such studies and tests and compensate the Grantor for any documented crop loss incurred as a result of these studies and tests.

8. **Siting of Works**

(a) The Grantee agrees that where technically possible, safe and commercially feasible, transmission and distribution lines or cables associated with the Substation or forming part of the Works shall be buried underground to a depth of at least one metre. Notwithstanding the foregoing, *Schedule "F"* attached hereto describes overhead transmission or distribution wires or cables transmission or distribution poles or similar structures that will be required to be located upon the Leased Lands. Furthermore, the location of any transmission and distribution lines or cables, once installed, shall not materially interfere with any drainage tiles or materially prevent the Grantor from accessing drainage tiles.

9. **Construction of Works**

(a) Subject to the restrictions, limitations and stipulations in Section 8, the rights and, privileges and leases hereby granted shall include, without limiting the generality of the foregoing, the right of the Grantee to:

(i) excavate or dig into and under the Leased Lands for the purposes of situating, stabilizing or anchoring the Works as required, in the Grantee's sole and reasonable discretion;

(ii) temporarily store any equipment, apparatus, materials and vehicles, including heavy equipment vehicles of whatsoever nature and kind upon the Leased Lands during the construction of the Works; and

(iii) construct temporary or permanent access roads to permit construction, operation, maintenance and decommissioning of the Works in accordance with this Agreement.

(b) The Grantee shall indemnify and save harmless the Grantor with respect to any claims under the provisions of the *Construction Lien Act* (Ontario), and successors thereto, including any legal costs incurred by the Grantor on a basis as between a solicitor and his own client.

10. **Maintenance of Works**

(a) The Grantee will exercise its rights hereunder so as to do as little injury as possible to the Leased Lands and will keep and maintain the Works in good repair. Without limiting the generality of the foregoing, the Grantee will conduct inspections of the Works, including the Substation, on a regular basis and complete any maintenance which the Grantee, in its reasonable opinion, determines is required in order to ensure that the Works, including the Substation, maintain a clean and uncluttered appearance and are, at all times, operating in a safe manner.

(b) The Grantor may, acting reasonably, provide notice to the Grantee with respect to a maintenance issue respecting the Works sited on the Leased Lands and request that the Grantee conduct maintenance or repair and the Grantee shall respond to such request with reasonable dispatch and determine, in the Grantee's reasonable opinion, whether any maintenance is required and the nature and scope of such required maintenance. If the Grantee determines that maintenance is required, the Grantee shall, at the Grantee's sole cost, complete such maintenance with reasonable dispatch and in a workmanlike manner.

11. **Modification of Works**

The Grantee, without paying any additional consideration, shall be entitled to erect upon the Leased Lands such Works as it may deem necessary for the purpose of reconstruction, relocating, replacing and decommissioning its Works and all related equipment, accessories and appurtenances thereto, within, upon or over the Leased Lands; provided, however, the Grantee will, as soon as practicable under the circumstances, take down, dismantle and remove all Works that are no longer required for its reconstructed, relocated or replaced Works and all related equipment, accessories and appurtenances thereto and will fill up all holes caused by such removal and restore the surface of the Leased Lands as far as may be reasonable and possible. For greater clarity, any reconstruction or replacement of Works and all related equipment shall be subject to Section 8.

12. **Advertising upon the Works**

Neither the Grantor, nor the Grantee shall be permitted to post any advertising, notice, poster, message or other publication of any kind whatsoever, using any medium either directly upon the Works or as an attachment or addition to the Works at any time during the Term. Notwithstanding this general prohibition, any manufacturer or retailer advertising associated directly with the Works, which appears upon the Works at the time such Works are purchased by the Grantee shall be permitted to remain at the sole discretion of the Grantee. Further, the Grantee shall be permitted to maintain or update such advertising in accordance with any requirements in any agreement between the Grantee and the vendor, supplier or manufacturer of the Works.

13. **Removal of Debris upon Completion of Construction**

Upon completion of the construction of the Works, the Grantee shall level any area of the Leased Lands on which the Grantee has undertaken construction or the Works have been installed unless otherwise agreed to by the Grantor, and shall remove all debris from the Leased Lands and restore the same to its former state except that the Substation and other Works shall not constitute debris.

14. **Storage of Equipment**

The Grantee shall not be entitled to store any construction-related vehicles, equipment and materials on the Leased Lands except in connection with the construction, maintenance, modification or removal of the Works. Grantee may store reasonable quantities of spare parts, materials and equipment necessary for the operation and maintenance of the Works by Grantee and its subcontractors.

15. **Access and Permitted Construction**

(a) The Grantor shall not, without the Grantee's consent in writing, not to be unreasonably withheld, change or permit the existing configuration, grade or elevation of the Leased Lands to be changed or permit any excavation or opening which may disturb the existing surface of the Leased Lands that would interfere with the Works.

(b) The Grantor shall not erect or store upon the Leased Lands any buildings, structures, erections, installations, materials, equipment, vehicles, agricultural products or any other obstructions whether above or below ground which might interfere with the use by the Grantee of the Leased Lands or the Works, including the efficient operation of any wind turbines and any Substation, without obtaining the prior written consent of the Grantee, not be unreasonably withheld.

(c) The Grantee may install fencing or other barriers on the Leased Lands in order to restrict unauthorized access to the Works. Should fencing be erected, Grantee shall install gates in every fence now or constructed in the future across the Leased Lands, such gates to be of sufficient width to admit passage of the Grantor's agricultural vehicles. The Grantee shall, if requested by the Grantor, furnish such gates with a lock.

16. **Construction Notice**

The Grantee shall submit the Construction Notice to Grantor not less than seventy-two (72) hours before the Leased Lands are initially accessed for the purposes of constructing and installing the Works, with no requirement for continued notice thereafter.

17. **Damage to Grantor's Property**

(a) The Grantee shall be liable for damage done to any of the Grantor's personal or real property (other than to crops, which is governed by section 6(a)(iii), including but not limited to damages to tile drains, fences, buildings, livestock, merchantable timber, shelter belts, windbreaks, ornamental or special use trees which may be installed, growing or running upon the Leased Lands or other lands owned by the Grantor (collectively, the "**Grantor's Property**"), by reason of the exercise by the Grantee of any or all the rights, privileges and Leases granted by this Lease (excepting damage caused to the property of the Grantor by his own act or that of his servants, agents or contractors and excepting damage caused to the Leased Lands by reason of or arising from the Works for which separate and sufficient compensation is paid by the Grantee to the Grantor pursuant to the consideration payments contemplated in this Lease) and, in the event that Grantor and the Grantee cannot agree at any time on the amount of damage payable to the Grantor hereunder, the Grantor shall provide written notice to the Grantee outlining the basis for the Grantor's assertion of damage to the Grantor's Property, the exact nature of damage, the source of the assertion that the alleged damage is the result of the exercise by the Grantee of the rights, privileges and Leases granted by this Lease and satisfactory evidence of the damage including documentation showing the extent of the damage and the financial impact of such damage.

(b) Within sixty (60) days of such documentation and evidence referred to in subsection (a) above being provided to the Grantee, the Grantee and the Grantor hereby agree to meet to discuss the nature and extent of the damage, whether the damage occurred as a result of the Grantee's exercise of its rights, privileges and Leases pursuant to this Lease. The Grantee and the Grantor hereby agree to use good faith efforts and act reasonably, to come to a determination as to whether and to what extent any compensation should be paid by the Grantee to the Grantor for the alleged damage. If any compensation is agreed to be paid to the Grantor, the Grantee shall provide payment to the Grantor within sixty (60) days of such agreement. If the Grantor and Grantee are not able to come to an agreement within sixty (60) days of their first meeting on the issue, then, in the case of crop loss, in each year where the Grantee is obliged to pay compensation, the Grantee will pay to the Grantor compensation for crop loss based on the fair market value of such crops. If the Grantor and the Grantee are unable to agree on the fair market value of the crops which were so damaged or lost, the fair market value of such crops shall be determined by an independent arm's length crop appraiser, selected by the Grantee and acceptable to the Grantor, acting reasonably. Either party may, by giving notice to the other party (the "**Notice of Arbitration**"), refer the matter to arbitration and the matter shall be determined in accordance with Section 44.

18. **Environmental Responsibility of the Parties**

(a) The Grantee shall be responsible for and save harmless the Grantor (including its successors and assigns), its directors, officers, employees, agents, consultants, contractors and assigns from any and all costs, actions, suits, claims, demands and expenses, including legal (on a solicitor and his own client basis), investigative and consulting fees and disbursements, which at any time, or from time to time may be asserted against, imposed upon or incurred by the Grantor or any of them, in connection with environmental contamination of any kind in contravention of applicable laws directly caused in, on, under or upon the Leased Lands as a result of operations conducted by or on behalf of the Grantee under this grant of Lease, including spills of hazardous materials, the killing or taking of any endangered animal, clean up orders or prosecutions under any environmental laws and for all remedial action that may be required to be taken to comply with applicable laws.

(b) The Grantee covenants that no hazardous or toxic material, including toxic lubricating oil (PCP), will be stored permanently on the Leased Lands and that all hazardous materials that are stored temporarily shall comply with all environmental laws.

(c) The Grantor represents and warrants, to the best of their knowledge, that there are no underground storage tanks, buried waste disposal sites or other environmental issues on the Leased Lands.

(d) The Grantor shall be responsible for and save harmless the Grantee, its directors, officers, employees, agents, consultants, contractors and assigns from any and all costs, actions, suits, claims, demands and expenses, including legal (on a solicitor and his own client basis), investigative and consulting fees and disbursements, which at any time, or from time to time may be asserted against, imposed upon or incurred by the Grantee or any of them, in connection with environmental contamination upon the Leased Lands that the Grantor knew or ought to have known based on information available to the Grantor at the time of the Grantor's purchase of the Leased Lands, excluding only the Grantee's responsibility under this Section 18. All accrued and undischarged obligations under this Section 18 shall survive the expiration or termination of this Lease.

19. **Intentionally Deleted**

20. **Mutual Indemnities**

(a) The Grantee shall indemnify and hold harmless the Grantor against all actions, suits, claims, demands and expenses, including solicitor and client costs, made or suffered by any person or persons, in respect of loss, injury, damage or obligation to compensate, arising out of or in connection with or as a result of:

(i) the negligence or willful misconduct of the Grantee;

(ii) any breach by the Grantee of the terms and conditions of this Lease; or

(iii) the Works or the operation of the Works, including loss of wind rights or nuisance on the part of neighbouring landowners. For greater clarity, any suit or claim with respect to loss of wind rights or nuisance will be vigorously challenged by the Grantee, provided that the Grantee shall not be liable under this Section to the extent to which such loss, damage or injury is caused or contributed to by the negligence or default of the (i) Grantor, its servants or agents, or (ii) any trespasser or unauthorized person who enters upon the Leased Lands. For greater certainty, the Grantee shall not be liable to the Grantor for the actions of the Grantor, its agents, employees, or representatives who enter upon the Leased Lands.

(b) The Grantor shall indemnify and hold harmless the Grantee against all actions, suits, claims, demands and expenses made or suffered by any person or persons, in respect of loss, injury, damage or obligation to compensate, arising out of or in connection with, or as a result of the negligence or willful misconduct of the Grantor, as well as in respect of any loss, injury or damage arising out of or in connection with, any breach by the Grantor of the terms and conditions of this Lease; provided that the Grantor shall not be liable under this Section to the extent to which such loss, damage or injury is caused or contributed to by the negligence or default of the Grantee, its servants or agents. For greater certainty, the Grantor shall not be liable to the Grantee for the actions of (i) the

Grantee, its agents, employees, or representatives who enter upon the Leased Lands, or (ii) any trespasser or unauthorized person who enters upon the Leased Lands.

(c) All accrued and undischarged obligations under this Section shall survive the expiration or termination of this Lease.

(d) Notwithstanding any liability and indemnity provisions in this Lease, neither the Grantor nor the Grantee shall be liable for special, consequential, incidental, punitive, exemplary or indirect damages (including without limitation any loss of anticipated revenues, earnings or profits or increased expense of operations), whether by statute, in contract, tort, including negligence, strict liability or otherwise, and all such damages are hereby expressly disclaimed.

21. **Ownership of Works**

Notwithstanding any rule of law or equity, all property and equipment, including the Works, placed or operated on the Leased Lands by or on behalf of the Grantee shall, at all times, remain the personal property of the Grantee even though attached to the Leased Lands.

22. **Removal of Works**

If the Works are no longer required by the Grantee, or should the Leased Lands be surrendered by the Grantee, or this Lease is terminated by the Grantor or the Grantee in accordance with the terms hereof (the "**Termination of Grantee Activities**"), the Grantee shall, within eighteen (18) months of the Termination of Grantee Activities, take down, dismantle and remove all Works, including any portion of the foundation, and electrical/grounding cables or materials which may lie beneath the surface of the Leased Lands, and fill up all holes caused by such removal and restore the surface of the Leased Lands to materially the same condition as the Leased Lands were prior to entry thereon and use thereof by the Grantee; provided that, with respect to that portion of the Leased Lands upon which the Substation is sited, the Grantee shall restore the surface of the portion of the Leased Lands to a state which allows the Leased Lands to sustain the growth of the same type of agricultural crops previously found on that portion of the Leased Lands occupied by the Substation. For greater clarity all oil-filled components installed or placed on or under the Leased Lands by the Grantee, regardless of their depth below surface, shall be removed.

23. **Default**

If either party makes any default in any term or condition of this Lease, this Lease shall not terminate provided that the defaulting party shall commence to remedy any such default within sixty (60) days after notice thereof in writing has been given to it by the non-defaulting party and thereafter the defaulting party proceeds to diligently complete the remedy. Notwithstanding the foregoing, default by reason of non-payment of any sum required to be paid to the Grantee hereunder shall entitle the Grantee to terminate the agreement if the Grantor fails to pay the sum owing on 30 days' notice in writing provided the amount unpaid is not the subject of an Arbitration Notice.

24. **Termination by Grantee**

The Grantee may, if it so chooses, elect to terminate all rights and obligations hereunder upon one (1) month's prior written notice to the Grantor. Upon the Grantee so electing to terminate its rights hereunder, the Grantee shall, at the sole cost and expense of the Grantee, remove and discharge any instrument or encumbrance registered against title to the Leased Lands and related to its interest in the Leased Lands.

25. **Survival**

Sections 13, 17, 18, 20, 21 and 22 shall survive the expiry or termination of this Lease for a period of two years, unless the party asserting a claim thereunder has set out in a written notice delivered in accordance with this Agreement, their claim in which case such claim may be pursued with due diligence, but no other claims may be made or asserted.

26. **Notices**

All notices to be given hereunder shall be in writing and all such notices and any payments to be made hereunder may be made or served personally or by registered letter addressed to the Grantor at:

■
[insert address]

Attention: ■

Tel:
Fax:

and addressed to the Grantee at:

SP Belle River Wind LP
c/o Samsung Renewable Energy Inc.
2050 Derry Road West, 2nd Floor
Mississauga, ON
L5N 0B9

Attention: President
Fax: (905) 285-1852

With a copy to:

c/o Pattern Energy Group LP
Pier 1, Bay 3
San Francisco, CA 94111
United States

Attention: General Counsel
Fax: (415) 362-7900

or such other address, as the Grantor or the Grantee respectively may from time to time advise and any such notices or payments shall be deemed to be given and received by the addressee upon personal service or, if served by registered letter, fourteen (14) days after mailing thereof, postage prepaid. In the event of a postal interruption, all notices to be given and all payments to be made hereunder may be made or served personally or delivered to the intended recipient at the address of the recipient set out above.

27. **Ownership**

The Grantor represents that it is the absolute owner of the Leased Lands subject only to the encumbrances listed in *Schedule "B"*. The Grantor shall notify the Grantee promptly and in writing of any change in ownership and the Grantee shall be entitled to continue to send notices to the existing Grantor until satisfied of the status of the change of ownership of the Leased Lands.

28. **Taxes**

(a)

(b)

29. **Interest in Land**

(a) This Lease and the rights created thereby shall be of the same force and effect, to all intents and purposes, as a covenant running with the Leased Lands and these presents, including all of the covenants and conditions herein contained, shall extend, be binding upon and enure to the benefit of the Grantor and the Grantee, and their respective executors, administrators, successors and assigns, as the case may be.

(b) The Grantee shall have the right from time to time, in its sole discretion to grant licences, assignments, charges of, or security interests in, its rights acquired hereunder, in whole or in part, to third parties, without further consideration becoming payable to the Grantor herein. The Grantor and the Grantee agree that to the extent of such license, assignment, charge or security interest in, this Lease and all rights, privileges, and benefits accruing thereunder, shall be declared to be appurtenant to and for the benefit of the lands and undertaking of such licensee, assignee, chargee or secured party. Any such assignment shall be subject to the limitations and obligations outlined in Section 42. The Grantee agrees that this Lease, and the rights, privileges and leases granted pursuant thereto shall be declared to be for the purpose of electricity transmission lines or electricity distribution lines within the meaning of Part VI of the *Ontario Energy Board Act, 1998*, and for the purpose of a renewable energy project within the meaning of the *Green Energy Act, 2009*.

30. **Number and Gender**

Wherever the singular or masculine is used throughout this Lease, the same shall be construed as being plural or feminine or a body corporate where the context might reasonably require. In the event of any conflict between metric and imperial expression of measurement in this Lease, the metric expression of measurement shall govern.

31. **Spousal Consent**

The Grantor represents and warrants that, as of the Commencement Date, the Grantor is either:

(a) not a spouse within the meaning of the *Family Law Act*, as amended, or

(b) a spouse within the meaning of the *Family Law Act*, as amended, and this Lease has been consented to in writing by such spouse as is evidenced by the signature of the spouse on the Consent attached as Appendix 1.

32. **Registration**

The Grantee shall be entitled, at its cost and expense, to register this Lease or a Notice in respect thereof and any required reference plans in the applicable land registry office and the Grantor agrees to execute all necessary instruments, plans and documentation for that purpose. Any reasonable costs associated with this shall be paid for by the Grantee.

33. **Quiet Possession**

The Grantee shall have quiet possession of the rights, privileges and Leases granted hereunder. The Grantee in performing and observing the covenants and conditions contained in this Lease, shall peacefully hold and enjoy the rights, privileges and Leases hereby granted without hindrance, molestation or interruption on the part of the Grantor, or of any person, firm or corporation claiming by, through, under or in trust for the Grantor.

34. **Further Assurances**

Each of the Grantor and Grantee shall, if so requested by the other, execute such further documents of title and any other required assurances in respect of the Leased Lands as may be required to perfect the Grantee's rights, privileges and leases granted pursuant to this Lease and the Grantee's interest in the Leased Lands. The Grantor further agrees to execute and deliver or cause to be executed and delivered any further legal instruments, including, without limitation, any required consents, and perform any acts which are or may become necessary to effectuate the purposes of this Lease and to complete the transactions contemplated hereunder. All costs associated with the requirements under this Section shall be borne by the Grantee.

35. **Non-waiver**

No waiver of a breach of any of the covenants of this Lease shall be construed to be a waiver of any succeeding breach of the same or any other covenant.

36. **Approvals**

(a) The Grantee, its contractors, consultants, agents and appointees, are hereby duly appointed as the Grantor's agent for the purposes of making applications for all Approvals, at the Grantee's expense, in relation to the Leased Lands and the rights granted pursuant to this Lease. The Lessor agrees to promptly execute and deliver such further agreements, applications and confirmations, and do such further things, as the Grantee may reasonably require to obtain any Approvals, at the Grantee's cost and expense. In this section, the term "**Approvals**" includes any authorizations, licences, approvals, permits, subdivision consents, rezoning applications, site plan agreements, and any other permissions from any authorities having jurisdiction which may be necessary or advisable to develop, install, construct and operate the Works and any related activities.

(b) Should the Grantor wish to sever any part of the Leased Lands to sell same to a third party, provided that the Grantor obtains all the required surveys and approvals to so sell and pays any and all costs and fees associated with the sale, the Grantee shall release that portion of the Leased Lands so severed from this Lease, provided such portion of the Leased Lands are not necessary to the Works of the Grantee as constructed or to be constructed on the Leased Lands.

37. **Income Tax Act**

The Grantor shall deliver to the Grantee a certificate issued under the provisions of Section 116 of the *Income Tax Act* (Canada) or satisfactory evidence by way of statutory declaration that the Grantor is not then a non-resident of Canada within the meaning of the *Income Tax Act* (Canada). Furthermore, the Grantee shall pay any and all taxes in respect of the payments required under this Lease, save and except for the Grantor's income taxes.

38. **Goods and Services Tax ("GST") and Harmonized Sales Tax ("HST")**

The Grantee covenants and agrees that if the Grantor is a registrant pursuant to the *Excise Tax Act* (Canada) (the "**ETA**"), the Grantee shall be liable for and shall pay to the Grantor an amount equal to the current rate of GST and, if applicable, HST expressed as a percentage of the consideration set forth above representing GST and, if applicable, HST payable under the ETA in connection with the granting of the rights, privileges and leases pursuant to this Lease. The Grantor on receipt of the aforementioned amount representing GST and, if applicable, HST shall remit such amount to the appropriate governmental authorities pursuant to and in accordance with the provisions of the ETA.

39. **Entire Agreement**

(a) This Lease and the Schedules attached hereto constitute the entire agreement between the parties pertaining to the subject matter hereof, and supersedes all prior and contemporaneous agreements, understandings, negotiations and discussions between the Parties whether oral or written.

(b) There are no representations, warranties, collateral agreements, conditions or other agreements between the Grantor and the Grantee hereto in connection with the subject matter hereof except as specifically set forth herein. No supplement, modification, waiver or termination of this Lease shall be binding unless in writing and executed by both the Grantor and the Grantee. No waiver of any provision of this Lease shall constitute a waiver of any other provision nor shall such waiver constitute continuing waiver unless otherwise expressly provided herein.

40. **No Affect on Statutory Rights**

This Lease shall not affect or prejudice the Grantor's or Grantee's statutory rights under the provisions of the *Ontario Energy Board Act, 1998*, *the Green Energy Act, 2009* or any other laws.

41. **Mortgage**

The Grantor acknowledges that a Charge/Mortgage of Land is registered on title to the Leased Lands as Instrument No. ■on■ (the "**Charge**"). The Grantor covenants and agrees to use its best efforts to obtain from the mortgagee of such Charge, the necessary postponement agreement, in form and substance satisfactory to the Grantee, acting reasonably, postponing the mortgagee's interest pursuant to the Charge in favour of the rights and interests of the Grantee pursuant to this Lease. Any reasonable costs associated with this shall be paid for by the Grantee.

42. **Assignment**

(a) Subject to subsection (c) below, this Lease may be assignable by the Grantor only the instance of a sale of the Leased Lands by the Grantor.

(b) Subject to subsection (c) below, the Grantee shall be able to assign this Lease and its interest in the Works and Leased Lands without the prior consent of the Grantor to any persons, including to its lender(s) as security for the Grantee's obligations to such lender(s). The Grantor hereby grants to any Secured Creditor the rights and remedies set forth in Schedule "E" hereto. In addition, the Grantor shall, from time to time at the request of the Grantee or a Secured Creditor, promptly execute and deliver in favour of any Secured Creditor such consents and acknowledgements granting and confirming the Secured Creditor's rights and remedies hereunder, including the rights and remedies set forth in Schedule "E" hereto, together with such changes as may be reasonably requested by such Secured Creditor. Any reasonable costs associated with this shall be paid for by the Grantee. Each Secured Creditor is intended to be and shall be a third-party beneficiary of the rights granted with respect to the Secured Creditor hereunder, notwithstanding that the Secured Creditor has not executed this Lease in the first instance.

(c) No assignment by either the Grantee or the Grantor, except to a Secured Creditor, shall be effective unless and until the assignee executes an agreement to be bound by this Lease (without the need for any other party to execute that counterpart) agreeing to be bound by the terms hereof to the same extent as if it had been an original party hereto. A counterpart of this Lease executed by the assignee shall be provided to the other party as soon as practicable after completion of the assignment.

43. **Arbitration**

(a) All matters in dispute between the Grantor and the Grantee pursuant to this Lease shall be determined by arbitration in accordance with this Section.

(b) Subject to the provisions in this Lease, any dispute arising pursuant to the terms of this Lease shall be resolved by the delivery by the Grantor or the Grantee, as the case may be, to the other of a notice that the former wishes to proceed to arbitration (the "**Arbitration Notice**"). Upon receipt of an Arbitration Notice, the Grantor and the Grantee shall have ten (10) days to agree upon a single arbitrator who is a lawyer, engineer, or energy industry executive having expertise in the subject area of the matters, but not the matters themselves, giving rise to the dispute that is the subject of the arbitration. If the Grantor and the Grantee are unable to agree on an arbitrator within that time, each of the Grantor and the Grantee shall appoint a single arbitrator and the two chosen arbitrators shall designate a third arbitrator. Schedule "D" sets out the arbitration procedure applicable to any arbitration conducted under this Lease.

44. **Insurance**

The Grantee shall name the Grantor as an additional insured on the Grantee's insurance policies related to the construction and operation of the Substation and the other Works on the Leased Lands.

[Signature page follows]

CONFIDENTIAL

IN WITNESS WHEREOF the Parties hereto have executed this Agreement on the date first above written.

.

_____	)	_____
Witness:	)	■
Name:	)	
Address:	)	
	)	
_____	)	_____
Witness:	)	■
Name:	)	
Address:	)	

■

Name:
Title:

I have the authority to bind the corporation

Name:
Title:

I have the authority to bind the corporation

CONFIDENTIAL

APPENDIX 1 to Grant of Lease

CONSENT OF SPOUSE

I, _____, being married to ■ do hereby give my consent to the grant of the Lease made in the Transfer and Grant of Lease dated ■ between ■ and ■ in respect of the following properties:

■

■

■

.

DATED this _____ day of _____, 201•.

_____	)	_____
WITNESS:	)	SPOUSE OF GRANTOR:
Name:	)	
Address:	)	

CONFIDENTIAL

SCHEDULE “A-1” to Grant of Lease

DESCRIPTION OF PROPERTY

[To be inserted]

CONFIDENTIAL

SCHEDULE "A-2" to Grant of Lease

DESCRIPTION OF LEASED LANDS

[To be inserted. NOTE: these lands to be described by way of R-Plan deposited on title.]

SCHEDULE "B" to Grant of Lease

ENCUMBRANCES ON LEASED LANDS

Notice of Lease in favour of SP Belle River Wind GP Inc. registered on ■ as Instrument No. ■.

[To be inserted at the time of execution of the Lease]

CONFIDENTIAL

SCHEDULE “C” to Grant of Lease

SKETCH SHOWING THE APPROXIMATE LOCATION OF THE SUBSTATION AND WORKS AND THE ROUTING OF THE ACCESS ROADS ON THE LEASED LANDS

[Sketch to be shown here]

Restrictions, if any, the siting of works or the routing of access roads upon the Leased Lands

NONE

CONFIDENTIAL

SCHEDULE "D" to Grant of Lease

ARBITRATION PROCEDURES

1) As used in this Schedule "D", the term "**Arbitrator**" means either the sole arbitrator or the panel of three arbitrators, appointed pursuant to Section 43 of the Lease, and the term "party" or "parties" shall mean the Grantor and the Grantee, or any one of them, as the context may require.

2) The parties hereto agree that the arbitration of any matter arising pursuant to the Lease that is to be settled by arbitration (the "**Matter**"), shall be governed by the *Arbitration Act 1991* (Ontario) (the "**Act**") as amended and supplemented by this Schedule "D", and shall constitute a submission for the purposes of the Act. All Matters referred to arbitration (including the scope of the agreement to arbitrate, the law relating to enforcement of the agreement to arbitrate, any relevant limitation periods, the law governing the procedure of the arbitration, the law relating to available remedies, set-off claims, conflict of laws rules and claims to costs and interest) shall be governed by the substantive laws of the Province of Ontario.

3) Arbitration shall be commenced by either party (the "**Complainant**") delivering a notice to the other party (the "**Respondent**"), describing the Matter. An Arbitrator shall be appointed in accordance with Section 43 of the Lease.

4) All decisions of the Arbitrator(s) with respect to the Matter shall be rendered in writing and shall contain a brief recital of the facts upon which the decision is made and the reasons thereof.

5) The following shall apply to the arbitration of any Matter:

   a) within ten (10) days of the appointment of the Arbitrator, the Complainant shall deliver to the Respondent and the Arbitrator a written statement (the "**Claim**") concerning the Matter setting forth, with particularity, its position with respect to the Matter and the material facts upon which it intends to rely;

   b) within ten (10) days after the delivery of the Claim, the Respondent shall deliver to the Complainant and the Arbitrator a written response (the "**Answer**") to the Complainant setting forth, with particularity, its position on the Matter and the material facts upon which it intends to rely;

   c) if the Respondent fails to deliver an Answer within the time limit referred to in (b) above, the Respondent shall be deemed to have admitted the Claim;

   d) within ten (10) days after the delivery of the Answer, the Complainant may deliver to the Respondent and the Arbitrator a written reply (the "**Reply**") to the Answer, setting forth, with particularity, its response, if any, to the Answer;

   e) within the time provided for the delivery of the Answer to the Claim, the Respondent may also deliver to the Complainant and the Arbitrators a counter-complaint (the "**Counter-Complaint**") setting forth, with particularity, any additional Matter for the Arbitrator to decide. Within ten (10) days of the delivery of a Counter-Complaint, the Complainant shall deliver to the Respondent and the Arbitrator an Answer to such Counter-Complaint. If the Complainant fails to deliver an answer to the Counter-Complaint within such ten (10) day period the Complainant will be deemed to have admitted the Counter-Complaint. Within ten (10) days after the delivery of an Answer to the Counter-Complaint, the Respondent may deliver to the Complainant and the Arbitrator a Reply to such Answer. Any Matter submitted to arbitration in accordance with this Subsection (e) shall be governed by, and dealt with as if it were the subject of a Complaint in accordance with this Schedule except that it shall be deemed a submission to the Arbitrator already appointed, and shall be determined by the Arbitrator accordingly;

   f) the time limits set for the delivery of the documents referred to in Subsections (a) to (e) inclusive of this Section 5 of Schedule "E" may be extended by the Arbitrator for such period and for such reasons as the Arbitrator in the Arbitrator's discretion may determine upon application made to the Arbitrator by either the Complainant or the Respondent, as the case may be, on notice to the other, either before the expiry of the time limit in issue or within two (2) days thereafter and, in the event that the other wishes to oppose the application, the party shall be given an opportunity to make submissions on the application;

g) upon completion of the foregoing steps in this Section 5 of Schedule "E" or upon the expiry of the time limit provided therefor if a step provided for in this Section is not taken by such time, either the Complainant or the Respondent may make application to the Arbitrator to convene a preliminary hearing for determination of the following:

i) appointing the time, date and place in Ontario for the hearing (the "**Hearing**") of the Matter, with the appointed place to be within fifty (50) kilometers of the Leased Lands;

ii) arranging for the production of documents pertaining to the Matter as between the Complainant and the Respondent;

iii) arranging for the delivery of and answers to written interrogatories pertaining to the Matter as between the Complainant and the Respondent;

iv) prescribing such additional rules and procedures considered by the Arbitrator to be necessary or desirable for the conduct of the arbitration (including, without limitation, compulsion of witnesses and discovery under oath); and

v) the Arbitrator shall at the time and place appointed by the Arbitrator pursuant to Subsection (f) of this Section 5 of Schedule "E", or as he, she or they may subsequently direct, convene the Hearing and shall, after the Hearing, determine the Matter or Matters submitted to him, her or them and make his, her or their award.

6) Every award of the Arbitrator made pursuant hereto shall be final and binding upon the Complainant and the Respondent and there shall be no appeal therefrom.

7) Arbitrator shall be paid his or her normal professional fees for his or her time and attendance in dealing with the Matter. The Arbitrator shall order the payment of such fees in accordance with the Act.

8) The Arbitrator shall have the power to award the costs of the arbitration.

9) All notices and all other documents required or permitted by this Schedule to be given by the Complainant or the Respondent to each other shall be given in accordance with the Lease. All notices and all other documents required or permitted by this Schedule to be given by the Complainant or the Respondent to the Arbitrator shall be given in accordance with the Arbitrator's instructions.

10) The arbitration shall be kept confidential and its existence and any element of it (including submissions and any evidence or documents presented or exchanged) shall not be disclosed beyond the Arbitrator, the Parties (including their shareholders, auditors and insurers), their counsel and any Person necessary to the conduct of the arbitration, except as required by law, regulation, or the rules or requirements of any stock exchange. No individual shall be appointed as an arbitrator unless he or she agrees in writing to be bound by this confidentiality provision.

11) The parties hereby agree to exclude Sections 10(4), 45 and 54 of the Act.

SCHEDULE "E" to Grant of Lease

RIGHTS AND REMEDIES ACCORDED TO SECURED CREDITORS UNDER THE TRANSFER AND GRANT OF LEASE

1. In this Schedule:

   (a) "**Mortgage**" means any assignment, mortgage, charge or security interest granted by the Grantee as security for its obligations to a Secured Creditor; and

   (b) "**Secured Creditor**" means any person to whom the Grantee grants as security a mortgage, charge or other security on all or a portion of the Belle River Wind Farm and/or the rights of the Grantee pursuant to the Lease.

2. The Grantor shall from time to time execute and deliver such consents and acknowledgements reasonably requested by a Secured Creditor.

3. The Grantor agrees that, upon any Secured Creditor giving the Grantor written notice of a Mortgage, the Secured Creditor will, without any further action being required, have the benefit of the following provisions until such time as the Secured Creditor advises the Grantor in writing that its Mortgage is no longer in effect (and, if the Secured Creditor so requests, the Grantor will (i) acknowledge in writing that such Secured Creditor so benefits from these provisions, or (ii) enter into a written agreement with the Secured Creditor substantially in accordance with these provisions):

   (a) the Grantor will give prompt written notice to the Secured Creditor of any breach or default by the Grantee of its obligations under the Lease in respect of which the Grantor proposes to exercise any of its remedies;

   (b) the Grantor will give the Secured Creditor the right to cure any breach or default by the Grantee under the Lease, within a period of 90 days commencing on the later of (i) the expiry of the cure period afforded the Grantee under the Lease, and (ii) the date on which the Grantor gives the Secured Creditor notice of such breach or default pursuant to Section 3(a), or such longer period of time as the Secured Creditor may reasonably require to cure such breach or default; and no exercise by the Grantor of any of its rights or remedies against the Grantee will be effective against the Grantee or the Secured Creditor unless the Grantor has the Secured Creditor such notice and opportunity to cure;

   (c) if the Secured Creditor is not capable of curing any breach or default of the Grantee under the Lease (such as a breach or default relating to the bankruptcy or insolvency of the Grantee), the Secured Creditor will have the right to cure all defaults that are curable within the time period specified in Section 3(b) and the Grantor agrees that it will not terminate the Lease (or exercise any other rights or remedies against the Secured Creditor) if all curable defaults are cured by the Secured Creditor within such time period;

   (d) the Grantor agrees that if there exists any breach or default of the Grantee under the Lease at any time when any receivership, insolvency, bankruptcy or similar proceedings or events relating to the Grantee are proceeding or when the Secured Creditor is enforcing the security of the Mortgage, (i) the Grantor will not terminate the Lease as a result thereof, and (ii) if the Lease is actually terminated or disclaimed in connection with or as a result of any such proceedings or enforcement, the Secured Creditor or its nominee or appointee will have the right to enter into a new Lease upon the same terms and conditions as the terminated Lease (the "**New Lease**"), provided that:

      A. the Secured Creditor has notified the Grantor in writing of its intention to enter into the New Lease within 90 days from the date the Secured Creditor receives written notice from the Grantor that the Lease has been terminated or disclaimed; and

      B. the Secured Creditor pays to the Grantor such amounts as may then be owing by the Grantee to the Grantor under the terminated Lease and cures or commences diligently to cure any breach or default by the Grantee under the terminated Lease that is capable of being cured by the Secured Creditor;

   and if the Secured Creditor notifies the Grantor of its intention to enter into a New Lease, then the Grantor will forthwith execute and deliver to the Secured Creditor a New Lease;

(e) if the Secured Creditor takes enforcement proceedings under the Mortgage and advises the Grantor of its intention in writing to maintain the Lease (the "**Secured Creditor Notice**"), the Secured Creditor: (i) will be entitled to all of the rights of the Grantee under the Lease as though it were an original party thereto, and (ii) will only be liable for: (A) the payment of any arrears that the Grantor gives the Secured Creditor written notice of within five (5) Business Days of the Secured Creditor Notice being given to the Grantor, and (B) the performance of the Grantee's covenants and obligations arising under the Lease, including but not limited to those in Section 22 of the Lease, for the period starting on the date enforcement proceedings were commenced and ending on the date such enforcement proceedings are terminated or the Secured Creditor assigns, transfers, surrenders or terminates the Lease in accordance with its terms;

(f) although the Grantor and the Grantee may modify the Lease from time to time between themselves, a Secured Creditor will not be bound by any adverse modifications made without the Secured Creditor's prior written consent;

(g) the Grantor will, at any time and from time to time, upon not less than five (5) Business Days' prior request by the Grantee or a Secured Creditor or proposed Secured Creditor, deliver to the Secured Creditor a statement in writing certifying that: (i) the Lease is in full force and full effect unamended (or setting out any such amendments), (ii) all amounts owing and payable under the Lease have been paid (or setting out any unpaid amounts), and (iii) to the Grantor's knowledge, the Grantee is not in default of its obligations under the Lease in any material respect (or setting out particulars of any such defaults);

(h) in addition to its obligations under Section 3(g), the Grantor will, at any time and from time to time, upon not less than five (5) Business Days' prior request by the Grantee or a Secured Creditor or proposed Secured Creditor, execute any agreements, certificates or acknowledgements that the Grantee or a Secured Creditor may reasonably request with respect to this Lease, the Property and/or the Leased Lands, including confirming the absence of a failure to perform an obligation set forth in this Lease, as applicable, as well as any approval of transfers and any non-disturbance agreements or agreements for peaceable enjoyment that the Grantee or a Secured Creditor may reasonably request. The Grantor and the Grantee will collaborate, if necessary, to amend this Lease in order to include herein any provision that the Grantee or a Secured Creditor may reasonably request to implement or give effect to the provisions of this Lease or protect and preserve the security of a Secured Creditor and to permit the Secured Creditor to have additional notices, time and protective rights to cure defaults and take the measures necessary to avoid termination of the leasehold interest or to reinstate this Lease or enter into a new lease for the balance of the Term on the same terms and conditions as this Lease, in the event that the Grantee fails to perform its obligations hereunder; and

(i) all notices to the Secured Creditor from the Grantor will be in writing and will be sent by personal delivery, registered mail, email or by fax to the address, email address or facsimile number of the Secured Creditor set out in any notice that the Secured Creditor delivers to the Grantor.

4. The provisions of Section 3 will enure to the benefit of the Secured Creditor and its successors and assigns, and any rights conferred on the Secured Creditor by the terms of this *Schedule "E"* to the Lease or limiting its liability under the Lease will benefit each receiver or receiver-manager appointed by the Secured Creditor or by a court of competent jurisdiction; and

5. The Grantor will give any purchaser or any other person acquiring an interest in the Lands notice of the Lease (including the terms of this Schedule "F") and any notice received from a Secured Creditor.

The Grantor hereby acknowledges that the Grantee may grant a Collateral Security to a trustee or collateral agent acting on behalf of one or more lenders (a "**Collateral Agent**"), and the Grantor hereby acknowledges and agrees that upon its receipt of notice that such Collateral Security was granted, the Collateral Agent will be entitled to all of the rights of the Secured Creditor set forth in this Schedule "F" to the Lease and such notice will constitute notice of the existence of the Collateral Agent as a Secured Creditor.

SCHEDULE "F" to Grant of Lease

DESCRIPTION OF OVERHEAD CABLES AND WIRES

[Note: To be Inserted by Grantee per Section 8 of Lease]

Schedule “B” to Option Agreement

INTENTIONALLY DELETED

SCHEDULE "C" to Option Agreement

PROPERTY OWNER'S CERTIFICATE OF INDEPENDENT LEGAL ADVICE

I, ■ of ■ in the Province of Ontario, Barrister and Solicitor, do hereby certify that I was this day consulted in my professional capacity by ■ named in the Option Agreement, dated ■ among ■ and SP Belle River Wind LP as to their obligations and rights under the said Option Agreement, that I acted solely for and explained fully to them the nature and effect of the said Option Agreement and they did acknowledge and declare that they fully understood the nature and effect thereof and did execute the said document in my presence and did acknowledge and declare and it appeared to me that they were executing the said document of their own volition and without fear, threats, compulsion, or influence by SP Belle River Wind LP, SP Belle River Wind GP Inc., or any other person.

DATED at _____, Ontario this _____ day of _____, 2015.

_____
■

CONFIDENTIAL

SCHEDULE "D" to Option Agreement

APPOINTMENT AND AUTHORIZATION OF AGENT

[I/We], the undersigned, being the registered owner(s) of the following lands (the "**Lands**"):

■

hereby authorize/**[s]** and appoint/**[s]** SP Belle River Wind LP ("**SP**"), its contractors, consultants, agents and appointees, as **[my/our]** agent for the purposes of making applications for all Approvals, at the SP's expense, and acting on my/our behalf in relation to applications or proceedings for Approvals with respect to the Lands or pursuant to its rights under an Option Agreement _____, 2015. The term "**Approvals**" includes any authorizations, licences, approvals, permits, subdivision consents, rezoning applications, site plan agreements, and any other permissions from any authorities having jurisdiction which may be necessary or advisable to develop, install, construct and operate any wind turbines, electrical transmission lines or distribution lines, substations, offices, laydown areas, access roads, road entrances and any related equipment or activities.

Dated this _____ day of _____, 2015.

_____ _____

(Signature of Property Owner) ■

_____ _____

(Signature of Property Owner) ■

■

_____

Name:
Title:

I have the authority to bind the corporation

Per: _____

Name:
Title:

I have the authority to bind the corporation

CONFIDENTIAL

SCHEDULE "E" to Option Agreement

ARBITRATION PROCEDURES

1) As used in this Schedule, the term "**Arbitrator**" means either the sole arbitrator or the panel of three arbitrators, appointed pursuant to Section 5.2 of the Agreement.

2) The Parties hereto agree that the arbitration of any matter arising pursuant to the Agreement that is to be settled by arbitration (the "**Matter**"), shall be governed by the *Arbitration Act 1991* (Ontario) (the "**Act**") as amended and supplemented by this Schedule "D", and shall constitute a submission for the purposes of the Act. All Matters referred to arbitration (including the scope of the agreement to arbitrate, the law relating to enforcement of the agreement to arbitrate, any relevant limitation periods, the law governing the procedure of the arbitration, the law relating to available remedies, set-off SP's, conflict of laws rules and SP's costs and interest) shall be governed by the substantive laws of the Province of Ontario.

3) Arbitration shall be commenced by either Party (the "**Complainant**") delivering a notice to the other Party (the "**Respondent**"), describing the Matter. An Arbitrator shall be appointed in accordance with Section 5.2 of the Agreement.

4) All decisions of the Arbitrator(s) with respect to the Matter shall be rendered in writing and shall contain a brief recital of the facts upon which the decision is made and the reasons thereof.

5) The following shall apply to the arbitration of any Matter:

   a) within ten (10) days of the appointment of the Arbitrator, the Complainant shall deliver to the Respondent and the Arbitrator a written statement (the "**Claim**") concerning the Matter setting forth, with particularity, its position with respect to the Matter and the material facts upon which it intends to rely;

   b) within ten (10) days after the delivery of the CISP, the Respondent shall deliver to the Complainant and the Arbitrator a written response (the "**Answer**") to the Complainant setting forth, with particularity, its position on the Matter and the material facts upon which it intends to rely;

   c) if the Respondent fails to deliver an Answer within the time limit referred to in (b) above, the Respondent shall be deemed to have admitted the Claim;

   d) within ten (10) days after the delivery of the Answer, the Complainant may deliver to the Respondent and the Arbitrator a written reply (the "**Reply**") to the Answer, setting forth, with particularity, its response, if any, to the Answer;

   e) within the time provided for the delivery of the Answer to the Claim, the Respondent may also deliver to the Complainant and the Arbitrators a counter-complaint (the "**Counter-Complaint**") setting forth, with particularity, any additional Matter for the Arbitrator to decide. Within ten (10) days of the delivery of a Counter-Complaint, the Complainant shall deliver to the Respondent and the Arbitrator an Answer to such Counter-Complaint. If the Complainant fails to deliver an answer to the Counter-Complaint within such ten (10) day period the Complainant will be deemed to have admitted the Counter-Complaint. Within ten (10) days after the delivery of an Answer to the Counter-Complaint, the Respondent may deliver to the Complainant and the Arbitrator a Reply to such Answer. Any Matter submitted to arbitration in accordance with this subsection e) shall be governed by, and dealt with as if it were the subject of a Complaint in accordance with this Schedule except that it shall be deemed a submission to the Arbitrator already appointed, and shall be determined by the Arbitrator accordingly;

   f) the time limits set for the delivery of the documents referred to in subsections a) to e) inclusive of this Section 5) of Schedule "D" may be extended by the Arbitrator for such period and for such reasons as the Arbitrator in the Arbitrator's discretion may determine upon application made to the Arbitrator by either the Complainant or the Respondent, as the case may be, on notice to the other, either before the expiry of the time limit in issue or within two (2) days thereafter and, in the event that the other wishes to oppose the application, the Party shall be given an opportunity to make submissions on the application;

g) upon completion of the foregoing steps in this Section 5) of Schedule "D" or upon the expiry of the time limit provided therefor if a step provided for in this Section is not taken by such time, either the Complainant or the Respondent may make application to the Arbitrator to convene a preliminary hearing for determination of the following:

i) appointing the time, date and place in Ontario within fifty (50) kilometers of the Property for the hearing (the "**Hearing**") of the Matter, with the appointed place to be within fifty kilometers of the Property;

ii) arranging for the production of documents pertaining to the Matter as between the Complainant and the Respondent;

iii) arranging for the delivery of and answers to written interrogatories pertaining to the Matter as between the Complainant and the Respondent;

iv) prescribing such additional rules and procedures considered by the Arbitrator to be necessary or desirable for the conduct of the arbitration (including, without limitation, compulsion of witnesses and discovery under oath); and

v) the Arbitrator shall at the time and place appointed by the Arbitrator pursuant to subsection f) of this Section 5) of Schedule "D", or as he, she or they may subsequently direct, convene the Hearing and shall, after the Hearing, determine the Matter or Matters submitted to him, her or them and make his, her or their award.

6) Every award of the Arbitrator made pursuant hereto shall be final and binding upon the Complainant and the Respondent and there shall be no appeal therefrom.

7) Arbitrator shall be paid his or her normal professional fees for his or her time and attendance in dealing with the Matter. The Arbitrator shall order the payment of such fees in accordance with the Act.

8) The Arbitrator shall have the power to award the costs of the arbitration.

9) All notices and all other documents required or permitted by this Schedule to be given by the Complainant or the Respondent to each other shall be given in accordance with the Agreement. All notices and all other documents required or permitted by this Schedule to be given by the Complainant or the Respondent to the Arbitrator shall be given in accordance with the Arbitrator's instructions.

10) The arbitration shall be kept confidential and its existence and any element of it (including submissions and any evidence or documents presented or exchanged) shall not be disclosed beyond the Arbitrator, the Parties (including their shareholders, auditors and insurers), their counsel and any Person necessary to the conduct of the arbitration, except as required by law, regulation, or the rules or requirements of any stock exchange. No individual shall be appointed as an arbitrator unless he or she agrees in writing to be bound by this confidentiality provision.

11) The Parties hereby agree to exclude Sections 10(4), 45 and 54 of the Act.

CONFIDENTIAL

[NTD: DELETE CONSENT IF PROPERTY OWNER IS A CORPORATION]

SCHEDULE "F" to Option Agreement

CONSENT OF SPOUSE

I, _____, being married to _____ do hereby give my consent to this transaction, including the execution of this Agreement dated _____, 2015 between _____ and _____ in respect of the following property:

■.

DATED this _____ day of _____, 2015.

_____	)	_____
WITNESS:	)	SPOUSE OF GRANTOR:
Name:	)	Name:
Address:	)	

OVERVIEW OF SYSTEM IMPACT ASSESSMENT

The final System Impact Assessment Report (the "**SIA**") performed by the Independent Electricity System Operator (the "**IESO**") dated December 11, 2015 indicates that the proposed connection of the Transmission Project, operating up to 100 MW, is expected to have "no material adverse impact on the reliability of the integrated power system".

The Applicant confirms that it will implement the requirements noted by the IESO in the SIA.

The Applicant received a *Notification of Conditional Approval of Connection Proposal* (the "**Notification**") from the IESO on December 11, 2015.

The SIA is at Exhibit F, Tab 1, Schedule 3 and the Notification is at Exhibit F, Tab 1, Schedule 2.

Notification of Conditional Approval of Connection Proposal

December 11, 2015

Colin Edwards
Director, Pattern Energy Group
355 Adelaide St. West,
Toronto, Ontario M5V 1S2, Canada

Independent Electricity System Operator
Station A, Box 4474
Toronto, ON M5W 4E5
t 905.403.6900
www.ieso.ca

Dear Mr. Edwards:

RE: Belle River Wind Project
Notification of Conditional Approval of Connection Proposal
CAA ID Number: 2015-548

The IESO has now had an opportunity to review and assess your company's proposed connection of the Belle River Wind Project as described in your System Impact Assessment application. The IESO has concluded that the proposed connection will not result in a material adverse impact on the reliability of the integrated power system. The IESO is therefore pleased to grant **conditional approval** as detailed in the attached System Impact Assessment report. Please note that any further material change to your proposed connection may require a re-assessment by the IESO and may result in a nullification of the conditional approval.

Please note that this conditional approval does not in any way constitute an endorsement of the proposed connection for the purposes of obtaining a contract with the IESO for the procurement of supply, generation, demand response, demand management or ancillary services.

You may now initiate the IESO's **Market Registration** process. To do so, please contact Market Registration at market.registration@ieso.ca at least eight months prior to your expected energization date. The SIA report, attached hereto, details the requirements that your company must fulfill during this process, including demonstrating that the facility *as installed* will not be materially different from the facility *as approved* by the IESO.

Your conditional right to connect is balanced by an obligation to demonstrate installed equipment meets performance requirements. During the **Market Registration** process, you shall be required to demonstrate this obligation has been fulfilled in accordance with Market Manual 2: Market Administration Part 2.20: Performance Validation.

When your company has successfully completed the IESO's **Market Registration** process, the IESO will provide you with a **final** approval, thereby confirming that the facility is fully authorized to connect to the IESO-controlled grid.

If you have any questions or require further information, please contact me.

Yours truly,

Ahmed Maria
Manager – Connections & Registration
Telephone: *(905) 855-6457*
Fax: *(905) 855-6319*
E-mail: *ahmed.maria@ieso.ca*
cc: *IESO Records*

System Impact Assessment

REPORT

Independent Electricity System Operator

System Impact Assessment Report

CONNECTION ASSESSMENT & APPROVAL PROCESS

2nd Draft

CAA ID: 2015-548
Project: Belle River Wind Project
Applicant: SP Belle River Wind LP

Connections & Registration Department
Independent Electricity System Operator

Date: November 24th, 2015

Confidential-To be Public when Finalized

Document Name	System Impact Assessment Report
Issue	2nd Draft
Reason for Issue	Issue for Comments
Effective Date	November 24th, 2015

System Impact Assessment Report

Acknowledgement

The IESO wishes to acknowledge the assistance of Hydro One in completing this assessment.

Disclaimers

IESO

This report has been prepared solely for the purpose of assessing whether the connection applicant's proposed connection with the IESO-controlled grid would have an adverse impact on the reliability of the integrated power system and whether the IESO should issue a notice of conditional approval or disapproval of the proposed connection under Chapter 4, section 6 of the Market Rules.

Conditional approval of the proposed connection is based on information provided to the IESO by the connection applicant and Hydro One at the time the assessment was carried out. The IESO assumes no responsibility for the accuracy or completeness of such information, including the results of studies carried out by Hydro One at the request of the IESO. Furthermore, the conditional approval is subject to further consideration due to changes to this information, or to additional information that may become available after the conditional approval has been granted.

If the connection applicant has engaged a consultant to perform connection assessment studies, the connection applicant acknowledges that the IESO will be relying on such studies in conducting its assessment and that the IESO assumes no responsibility for the accuracy or completeness of such studies including, without limitation, any changes to IESO base case models made by the consultant. The IESO reserves the right to repeat any or all connection studies performed by the consultant if necessary to meet IESO requirements.

Conditional approval of the proposed connection means that there are no significant reliability issues or concerns that would prevent connection of the proposed project to the IESO-controlled grid. However, the conditional approval does not ensure that a project will meet all connection requirements. In addition, further issues or concerns may be identified by the transmitter(s) during the detailed design phase that may require changes to equipment characteristics and/or configuration to ensure compliance with physical or equipment limitations, or with the Transmission System Code, before connection can be made.

This report has not been prepared for any other purpose and should not be used or relied upon by any person for another purpose. This report has been prepared solely for use by the connection applicant and the IESO in accordance with Chapter 4, section 6 of the Market Rules. This report does not in any way constitute an endorsement, agreement, consent or acknowledgment of any kind of the proposed connection for the purposes of obtaining or administering a contract with the IESO for the procurement of electricity supply, generation, demand response, conservation and demand management or ancillary services.

The IESO assumes no responsibility to any third party for any use, which it makes of this report. Any liability which the IESO may have to the connection applicant in respect of this report is governed by Chapter 1, section 13 of the Market Rules. In the event that the IESO provides a draft of this report to the connection applicant, the connection applicant must be aware that the IESO may revise drafts of this report at any time in its sole discretion without notice to the connection applicant. Although the IESO will use its best efforts to advise you of any such changes, it is the responsibility of the connection applicant to ensure that the most recent version of this report is being used.

Hydro One

The results reported in this report are based on the information available to Hydro One, at the time of the study, suitable for a System Impact Assessment of this connection proposal.

The short circuit and thermal loading levels have been computed based on the information available at the time of the study. These levels may be higher or lower if the connection information changes as a result of, but not limited to, subsequent design modifications or when more accurate test measurement data is available.

This study does not assess the short circuit or thermal loading impact of the proposed facilities on load and generation customers.

In this report, short circuit adequacy is assessed only for Hydro One circuit breakers. The short circuit results are only for the purpose of assessing the capabilities of existing Hydro One circuit breakers and identifying upgrades required to incorporate the proposed facilities. These results should not be used in the design and engineering of any new or existing facilities. The necessary data will be provided by Hydro One and discussed with any connection applicant upon request.

The ampacity ratings of Hydro One facilities are established based on assumptions used in Hydro One for power system planning studies. The actual ampacity ratings during operations may be determined in real-time and are based on actual system conditions, including ambient temperature, wind speed and project loading, and may be higher or lower than those stated in this study.

The additional facilities or upgrades which are required to incorporate the proposed facilities have been identified to the extent permitted by a System Impact Assessment under the current IESO Connection Assessment and Approval process. Additional project studies may be necessary to confirm constructability and the time required for construction. Further studies at more advanced stages of the project development may identify additional facilities that need to be provided or that require upgrading.

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Executive Summary

Notification of Conditional Approval

SP Belle River LP (the "connection applicant") has proposed to develop a 100 MW wind generation facility, called Belle River Wind Project (the "project"), at Lakeshore, Ontario. The project will connect to 230 kV circuit C23Z, 31.5 km from Lauzon TS. The project has been awarded a Power Purchase Agreement with the Ontario government. As proposed, the project includes the following:

- Forty-one Wind Turbine Generators (WTGs), Siemens model SWT-3.2-113. The maximum generation capacity of some of the WTGs will be permanently de-rated based on noise compliance requirements so that the total project output will not exceed 100 MW;
- Four underground 34.5 kV collectors each having between 10 and 11 WTGs;
- One 230 kV/34.5 kV substation (called Joe Byrne Substation) consisting of the main 34.5 kV switchgear B1 bus and a main transformer rated 66/88/110 MVA, 240/34.5 kV with an Under Load Tap Changer (ULTC);
- One 230 kV switching station (called Brody Switching Station) at the connection point to C23Z;
- A 7 km, 230 kV overhead line (L1) that connects Joe Byrne Substation to Brody Switching Station.

The single line diagram of the project is shown in Figure 1.

This assessment concludes that the proposed connection of the project, operating up to 100 MW, is expected to have no material adverse impact on the reliability of the integrated power system. Therefore, the IESO recommends that a *Notification of Conditional Approval for Connection* be issued for the project subject to the implementation of the requirements outlined in this report.

Findings

We have analyzed the project on the system reliability of the integrated power system, and based on our study results, we have identified that:

(1) The project will not fall within the Northeast Power Coordinating Council's (NPCC) definition of the Bulk Power System (BPS), but will fall within the North American Electric Reliability Corporation's (NERC) definition of the Bulk Electric System (BES).

(2) The connection arrangement of the project is acceptable to the IESO.

(3) The system fault levels after the incorporation of the project will not exceed the interrupting capabilities of the existing circuit breakers in the IESO-controlled grid near the project.

(4) The reactive power capability of the project will meet the Market Rules requirements based on equivalent electrical model of the project's collection system as provided by the connection applicant.

(5) Existing generation congestion in the West zone was identified. The project increases power flows on the 230kV circuits in the West zone and thus increases congestion. At times, the connection applicant may need to curtail the output of the project for reliability purposes.

(6) The voltage performance of the IESO-controlled grid is expected to be acceptable under both pre-contingency and post-contingency conditions after the incorporation of the project.

(7) The functions of the project's wind farm control system meets the requirements in the Market Rules.

(8) The project's WTGs and other existing generators in vicinity of the project are expected to be transiently stable following planning events.

(9) The project's WTGs are expected to be able to remain connected to the IESO-controlled grid for planning events that do not remove the project by configuration.

(10) The protection adjustments proposed in the transmitter's Protection Impact Assessment (PIA) report to incorporate the project are acceptable to the IESO and the project is not expected to cause any relay margin issues.

IESO Requirements for Connection

Transmitter Requirements

The following requirements are applicable to Hydro One Networks Inc., the "transmitter", for the incorporation of the project:

(1) The relay settings of the 230 kV circuit C23Z, and any other protections affected by the project's incorporation, must be revised as per solutions identified in the PIA.

Protection modifications that are different from those considered in this SIA must be submitted to the IESO at least six (6) months before any modifications are to be implemented. The IESO will assess those modifications and if they result in adverse impact on the reliability of the integrated power system, the connection applicant and the transmitter will be required to develop mitigation solutions.

Connection Applicant Requirements

Specific Requirements: The following *specific* requirements are applicable for the incorporation of project. Specific requirements pertain to the level of reactive compensation needed, operation restrictions, special protection system, upgrading of equipment and any project specific items not covered in the *general requirements*.

(1) The connection applicant may need to curtail the output of the project for reliability purposes.

(2) The connection applicant needs to provide zero-sequence impedance for the main step-up transformer and equivalent collector zero-sequence impedance during the IESO Market Registration process.

General Requirements: The connection applicant shall satisfy all applicable requirements specified in the Market Rules, the Transmission System Code and reliability standards, as presented in Section 2 of this report.

– End of Section –

1. Introduction

SP Belle River LP (the "connection applicant") has proposed to develop a 100 MW wind generation facility, called Belle River Wind Project (the "project"), at Lakeshore, Ontario. The project will connect to 230 kV circuit C23Z, 31.5 km from Lauzon TS. The project has been awarded a Power Purchase Agreement with the Ontario government. As proposed, the project includes the following:

- Forty-one Wind Turbine Generators (WTGs), Siemens model SWT-3.2-113. The maximum generation capacity of some of the WTGs will be permanently de-rated based on noise compliance requirements so that the total project output will not exceed 100 MW;
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- One 230 kV switching station (called Brody Switching Station) at the connection point to C23Z;
- A 7 km, 230 kV overhead line (L1) that connects Joe Byrne Substation to Brody Switching Station.

The single line diagram of the project is shown in Figure 1. The preliminary commercial in-service date of the project is December 1st, 2016.

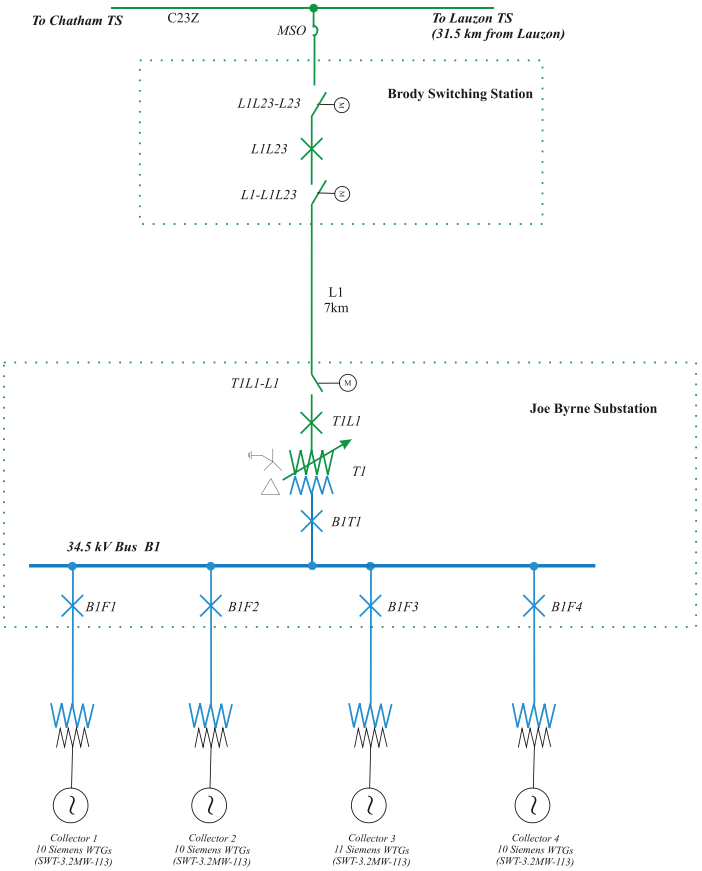


Figure 1: Single Line Diagram of the Project

– End of Section –

2. General Requirements

The connection applicant shall satisfy all applicable requirements specified in the Market Rules, the Transmission System Code and reliability standards. The following sections highlight some of the general requirements that are applicable to the project.

2.1 Reliability Standards Requirements

As currently assessed, the project does not fall within the Northeast Power Coordinating Council's (NPCC) definition of the Bulk Power System (BPS).

Effective July 1, 2014, the new North American Electric Reliability Corporation's (NERC's) definition of the Bulk Electric System (BES) is used in Ontario. Based on this new definition, the following equipment at the project will be categorized as BES elements:

- 230 kV circuit breaker L1L23, T1L1;
- 230 kV transmission circuit L1;
- All WTGs;
- 34.5/230 kV main step-up transformer T1;
- 34.5 kV bus B1;
- 34.5 kV circuit breaker B1T1;

The connection applicant will need to bring the proposed BES elements into compliance with the applicable NERC reliability standards. To determine the standard requirements that are applicable to this project, the IESO provides a mapping tool titled "NERC Reliability Standard Mapping Tool/Spreadsheet," which can be accessed at the IESO's public website

http://ieso.ca/imoweb/pubs/ircp/NERC_Reliability_Standards_Mapping_Tool_Spreadsheet.xls

Note, the connection applicant may request an exception to the application of the BES definition. The procedure for submitting an application for exemption can be found in Market Manual 11.4: "Ontario Bulk Electric System (BES) Exception" at the IESO's website:
http://ieso.ca/imoweb/pubs/ircp/rc_OntarioBESException.pdf

The IESO's criteria for determining applicability of NERC reliability can be found in the Market Manual 11.1: "Applicability Criteria for Compliance with NERC Reliability Standards and NPCC Criteria" at the IESO's website
http://ieso.ca/imoweb/pubs/ircp/IESO_Applicability_Criteria_for_Compliance_with_NERC_Standards_and_NPCC_Criteria.pdf

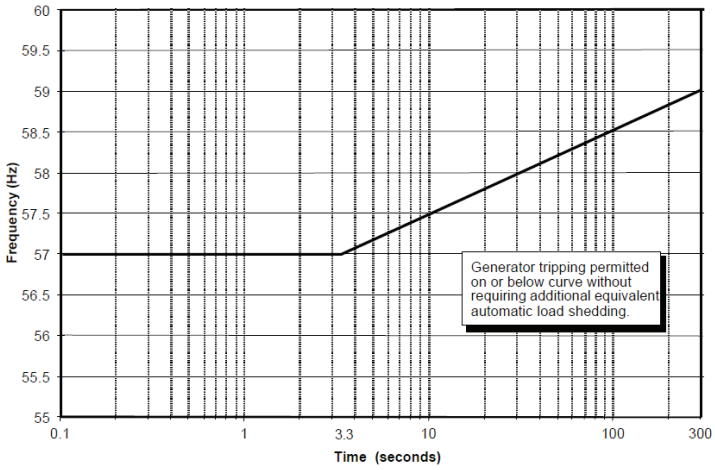
Compliance with these reliability standards will be monitored and assessed as part of the IESO's Ontario Reliability Compliance Program. For more details about compliance with applicable reliability standards reliability standards, the connection applicant is encouraged to contact orcp@ieso.ca and also visit the following webpage: http://www.ieso.ca/imoweb/ircp/orcp.asp.

Note, the BPS and BES classifications of this project will be re-evaluated as the electrical system evolves.

2.2 Frequency/Speed Requirements

As per Appendix 4.2 of the Market Rules, the connection applicant shall ensure that the generation facility has the capability to operate continuously between 59.4 Hz and 60.6 Hz and for a limited period

of time in the region above straight lines on a log-linear scale defined by the points (0.0 s, 57.0 Hz), (3.3 s, 57.0 Hz), and (300 s, 59.0 Hz), as shown in the following figure.



The project shall respond to frequency increase by reducing the active power with an average droop based on maximum active power adjustable between 3% and 7% and set at 4%. Regulation deadband shall not be wider than ± 0.06%. The generation facility shall respond to system frequency decline by temporarily boosting its active power output for some time (i.e. 10 s) by recovering energy from the rotating blades. This usually refers to "inertia emulation control" function within the wind farm control system. It is not required for wind facilities to provide a sustained response to system frequency decline. The connection applicant will need to indicate to the IESO whether the function of inertia emulation control is commercially available for the proposed type of wind turbine generator at the time when the wind farm comes into service. If this function is available, the connection applicant is required to implement it before the new facility can be placed in-service. If this function is commercially unavailable, the IESO reserves the right to ask the connection applicant to install this function in the future, once it is commercially available for the proposed type of wind turbine generator.

2.3 Reactive Power/Voltage Regulation Requirements

The generation facility is directly connected to the IESO-controlled grid, and thus, the connection applicant shall ensure that the project has the capability to:

- supply continuously all levels of active power output for 5% deviations in terminal voltage. Rated active power is the smaller output at either rated ambient conditions (e.g. temperature, head, wind speed, solar radiation) or 90% of rated apparent power. To satisfy steady-state reactive power requirements, active power reductions to rated active power are permitted;
- inject or withdraw reactive power continuously (i.e. dynamically) at a connection point up to 33% of its rated active power at all levels of active power output except where a lesser continually available capability is permitted by the IESO. If necessary, shunt capacitors must be installed to offset the reactive power losses within the project. If generators do not have dynamic reactive power capabilities, dynamic reactive compensation devices must be installed to make up the deficient reactive power;
- regulate automatically voltage within ±0.5% of any set point within ±5% of rated voltage at a point whose impedance (based on rated apparent power and rated voltage) is not more than 13% from the highest voltage terminal. If the AVR target voltage is a function of reactive power output, the slope $\Delta V/\Delta Q_{max}$ shall be adjusted to not more than 0.5%. The response time of the generation facility

for voltage changes shall be within the range between 100 milliseconds and 1 second, similar to the response of a generation facility with a synchronous generation unit and an excitation system that meets the requirements of Appendix 4.2.

As per the Market Rules requirements, the project shall operate in voltage control mode and provide their reactive power capability requirements by using all voltage control methods available within the project. The overall automatic voltage regulation philosophy for the project is summarized as follow:

- All WTGs control the voltage at a point whose impedance (based on rated apparent power and voltage of the project) is not more than 13% from the connection point. Appropriate control slope is adopted for reactive power sharing among the WTGs as well as with adjacent generators. The reference voltage will be specified by the IESO during operation.
- Shunt capacitors and reactors (when applicable) shall be automatically switched to regulate the overall reactive power output from the project's wind turbine generators (or dynamic reactive power sources) to approximately zero output. The dead band for shunt switching will be set to no less than ±60% of the smallest shunt to avoid control hunting. The switching time of the shunt compensation shall be fast enough to satisfy the requirements relevant to Appendix 4.2 Categories 5, 6, and 7. After having been switched, the shunt compensation shall become available for the next operation within 5 minutes.
- The main transformer ULTC (when available) shall be adjusted manually to regulate the collector bus voltage such that it is within normal range and close to about 100% of nominal voltage.
- In the event that the voltage control system of the generation facility becomes unavailable, each wind turbine generator must be able to be switched to reactive power control or terminal voltage control, to maintain its reactive power output or terminal voltage to the value prior to the loss of signal from the voltage control system. Depending on system conditions, further action for reliability purposes would be directed by the IESO.

The connection applicant is required to provide a finalized copy of the functional description of the wind farm control systems for approval to the IESO before the project is given final approval to connect.

2.4 Voltage Ride-Through Requirements

The generation facility shall have the capability to ride through routine switching events and design criteria contingencies assuming standard fault detection, auxiliary relaying, communication, and rated breaker interrupting times, unless disconnected by configuration.

2.5 Voltage Requirements

Appendix 4.1 of the Market Rules states that under normal operating conditions, the voltages in the 230 kV system in southern Ontario are maintained within the range of 220 kV to 250 kV. Thus, the IESO requires that the project's 230 kV equipment in southern Ontario must have a maximum continuous voltage rating of at least 250 kV.

Any protective relaying must be set to ensure that transmission equipment remains in-service for voltages up to 5% above the maximum continuous value specified in Appendix 4.1 of the Market Rules, to allow the power system to recover from transient disturbances.

2.6 Fault Levels Requirement

The Transmission System Code requires the project's 230 kV connection equipment to be designed to withstand the fault levels in the area where the equipment is installed. Thus, the connection applicant shall ensure that the project's connection equipment is designed to withstand the fault levels in the area. If any future system changes result in an increased fault level higher than the equipment's capability, the connection applicant is required to replace the equipment with higher rated equipment capable of withstanding the increased fault level, up to maximum fault level specified in the Transmission System Code. Appendix 2 of the Transmission System Code establishes the maximum fault levels for the transmission system. For the 230 kV system, the maximum 3 phase symmetrical fault level is 63 kA and the maximum single line to ground symmetrical fault level is 80 kA (usually limited to 63 kA).

Appendix 2 of the Transmission System Code states that the maximum rated interrupting time for the 230 kV breakers must be 3 cycles or less. Thus, the connection applicant shall ensure that the installed breakers meet the required interrupting time specified in the Transmission System Code. Fault interrupting devices must be able to interrupt fault currents at the maximum continuous voltage of 250 kV.

2.7 Protection System Requirements

The connection applicant shall ensure that the protection systems are designed to satisfy all the requirements of the Transmission System Code and any additional requirements identified by the transmitter. New protection systems must be coordinated with the existing protection systems.

This facility is considered essential to the power system and therefore, must be protected by redundant protection systems in accordance with section 8.2.1a of the TSC. These redundant protections systems must satisfy all requirements of the TSC, and in particular, they must not use common components, common battery banks or common secondary CT or PT windings.

As currently assessed by the IESO, this facility is not required to be part of an SPS. However, the connection applicant is required to have adequate provision in the design of protections and controls at the facility to allow for future installation of Special Protection Scheme (SPS) equipment. Should a future SPS be installed or an existing SPS be expanded to improve the transfer capability in the area or to accommodate transmission reinforcement projects, the facility may be required to participate in the SPS system and to install the necessary protection and control facilities to affect the required actions. These SPS facilities must comply with the NPCC Reliability Reference Directory #7 for Type 1 SPS. In particular, if the SPS is designed to have 'A' and 'B' protection at a single location for redundancy, they must be on different non-adjacent vertical mounting assemblies or enclosures. Two independent trip coils are required on the breakers selected for generation rejection (G/R).

The protection systems within the project must only trip the appropriate equipment required to isolate the fault. After the facility begins commercial operation, if an improper trip of the 230 kV circuit C23Z occurs due to events within the facility, the facility may be required to be disconnected from the IESO-controlled grid until the problem is resolved.

The autoreclosure of the project's high voltage breakers, i.e. L1L23 and T1L1, must be blocked. Upon its opening for a contingency, the high voltage breaker must be closed only after the IESO approval is granted.

2.8 Connection Equipment Design Requirements

The connection applicant shall ensure that the connection equipment is designed to be fully operational in all reasonably foreseeable ambient temperature conditions. The connection equipment must also be designed so that the adverse effects of its failure on the IESO-controlled grid are mitigated.

2.9 Disturbance Recording Requirement

The connection applicant is required to install a permanent device for disturbance recording that meets the technical specifications provided below. The device will be used to validate generator and SVC/STATCOM performance during and after market registration process.
The disturbance recording device shall have the capability to:

- Record times that are satellite clock synchronized.
- Derive positive sequence voltage, active power and reactive power at a rate of 1 sample/cycle.
- Accept 3 phase inputs of voltage and current at the low and high side of main output transformer(s) and the SVC/STATCOM terminals required to derive the quantities above.
- Trigger on high/low thresholds and rate of change thresholds for the three quantities above and frequency. The capability to manually trigger the device is also required.
- Provide data in COMTRADE ascii format unless another format is acceptable to IESO.
- Record the above derived quantities for a length of at least 30s, normally consisting of 5s pre-trigger and 25s post-trigger.

It is recommended, but not required, that the disturbance recording device should:

- Provide high speed sampling (approximately 100 samples/cycle) of all 3 phase sinusoidal voltages and currents at both sides of main output transformer(s) used as inputs to the disturbance recorder for at least one second. Record length should be adjustable and normally consist of about 0.2s pre-trigger and 0.8s post-trigger.

The quantities to be recorded and the trigger settings will be provided by the IESO during the IESO Market Registration process.

2.10 Telemetry Requirements

According to Section 7.3 of Chapter 4 of the Market Rules, the connection applicant shall provide to the IESO the applicable telemetry data listed in Appendix 4.15 of the Market Rules on a continual basis. As per Section 7.1.6 of Chapter 4 of the Market Rules, the connection applicant shall also provide data to the IESO in accordance with Section 5 of Market Manual 1.2, for the purposes of deriving forecasts of the amount of energy that the project is capable of producing. The complete telemetry list will be finalized during the IESO Market Registration process.

The data shall be provided with equipment that meets the requirements set forth in Appendix 2.2, Chapter 2 of the Market Rules and Section 5.3 of Market Manual 1.2, in accordance with the performance standards set forth in Appendix 4.19 subject to Section 7.6A of Chapter 4 of the Market Rules.

As part of the IESO Market Registration process, the connection applicant must complete end to end testing of all necessary telemetry points with the IESO to ensure that standards are met and that sign conventions are understood. All found anomalies must be corrected before IESO final approval to connect any phase of the project is granted.

2.11 Revenue Metering Requirement

If revenue metering equipment is being installed as part of the project, the connection applicant should be aware that revenue metering installations must comply with Chapter 6 of the IESO Market Rules. For more details the connection applicant is encouraged to seek advice from their Metering Service Provider (MSP) or from the IESO metering group.

2.12 Restoration Requirements

The connection applicant is currently a participant in the Ontario Power System Restoration Plan. The connection applicant is required to update its restoration participant attachment to include details regarding its proposed project. For more details please refer to the Market Manual 7.8. Details regarding restoration participant requirements will be finalized during the IESO Market Registration process.

As currently assessed by the IESO, the project is not classified as a Key Facility that is required to establish a Basic Minimum Power System following a system blackout. Key Facility and Basic Minimum Power System are terms defined in the NPCC Glossary of Terms.

2.13 IESO Market Registration Requirements

The connection applicant must initiate and complete the IESO Market Registration process in a timely manner, at least seven months before energization to the IESO-controlled grid and prior to the commencement of any project related outages, in order to obtain IESO final approval for connection.

Models and data, including any control systems that would be operational, must be provided to the IESO. This includes both PSS/E and DSA software compatible mathematical models representing the new equipment for further IESO, NPCC and NERC analytical studies. The models and data may be shared with other reliability entities in North America as needed to fulfill the IESO's obligations under the Market Rules, NPCC and NERC rules. The connection applicant may need to contact the software manufacturers directly, in order to have the models included in their packages. This information should be submitted at least seven months before energization to the IESO-controlled grid, to allow the IESO to incorporate the project into IESO work systems and to perform any additional reliability studies. Descriptions of control systems may also need to be provided to the IESO.

As part of the IESO Market Registration process, the connection applicant must provide evidence to the IESO confirming that the equipment installed meets the Market Rules requirements and matches or exceeds the performance predicted in this assessment. This evidence shall be either type tests done in a controlled environment or commissioning tests done on-site. In either case, the testing must be done not only in accordance with widely recognized standards, but also to the satisfaction of the IESO. Until this evidence is provided and found acceptable to the IESO, the Market Registration process will not be considered complete and the connection applicant must accept any restrictions the IESO may impose upon the project's participation in the IESO-administered markets or connection to the IESO-controlled grid. The evidence must be supplied to the IESO within 30 days after completion of commissioning tests. Failure to provide evidence may result in disconnection from the IESO-controlled grid.

If the submitted models and data differ materially from the ones used in this assessment, then further analysis of the project may need to be done by the IESO before final approval to connect is granted.

At the sole discretion of the IESO, performance tests may be required at the project. The objectives of these tests are to demonstrate that equipment performance meets the IESO requirements, and to confirm models and data are suitable for IESO purposes. The transmitter may also have its own testing

requirements. The IESO and the transmitter will coordinate their tests, share measurements and cooperate on analysis to the extent possible.

– End of Section –

3. Data Verification

3.1 Connection Arrangement

The connection arrangement of the project, as shown in Figure 1, will not reduce the level of reliability of the integrated power system and is, therefore, acceptable to the IESO.

3.2 Wind Turbine Generators

The project will employ Siemens type SWT-3.2-113 wind turbine generators (WTGs), which are full converter interfaced (Type 4). Table 1 provides the electrical specifications of the WTGs and their step-up transformers and their reactive power curve is shown in Figure 2.

Table 1: Specifications of Proposed WTGs

Type	Rated Voltage	Rated MVA	Rated MW	Transformer		
				MVA	R	X
Siemens-3.2-113	690V	3.56	3.2	3.4	0.46%	5.98%

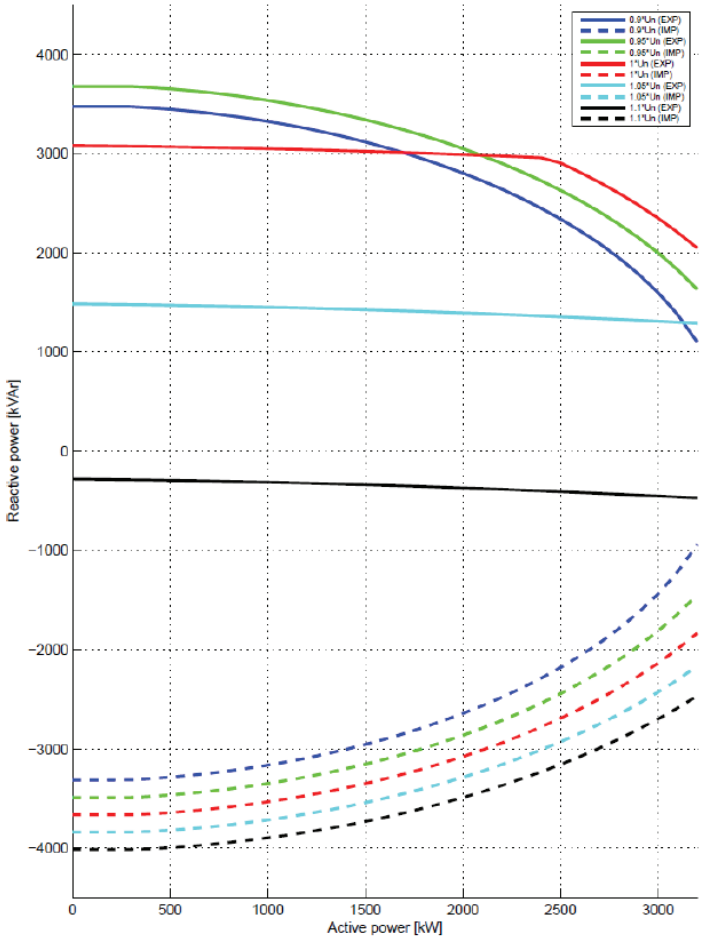


Figure 2: Reactive Power Capability Curves for SWT-3.2 DD 60 Hz Wind Turbines at LV Sides of Wind Turbine Transformer (P > 0 kW)

Some of the WTGs will permanently de-rated based on noise compliance requirements so that the total project output will not exceed 100 MW. Table 2 shows the number of WTGs of each rating type for each collector.

Table 2: Number of WTGs of Each Rating Type for Collectors

Collector	Unit#	Units at 3.2 MW	Units at 2.969 MW	Units at 2.772 MW	Units at 2.473 MW	Units at 2.37 MW	Units at 2.257 MW	Total MW
C1	10	1	1	0	3	2	3	25.10
C2	10	0	0	2	2	6	0	24.71
C3	11	0	0	0	2	4	5	25.71
C4	10	1	0	1	0	4	4	24.48

Voltage Ride-Though Capability

During a voltage drop/raise, the minimum time for a WTG to remain online is shown in Table 3.

Table 3: WTG Voltage Ride-Through Capability

Voltage Range (% of base voltage)	Minimum time for WTGs to Remain Online (s)
110-120	1
90-110	Continuous
85-90	200
70-85	2.6
40-70	1.6
15-40	0.85

The voltage ride-through capability for the project's WTGs was found to be adequate in time-domain simulations detailed in Section 5.7.

Frequency Ride-Through Capability

Table 4 presents the frequency ride-through capability of the project's WTGs, which meets the Market Rules requirements as shown in Section 2.2.

Table 4: Frequency Ride-Through Capability

Frequency range (Hz)	Minimum time for WTGs to Remain Online (s)
57.0-62.0	Continuous

3.3 Collector System

Table 5: Equivalent Impedance of Collectors

Collector	Unit#	MW	Positive-Sequence Impedance (pu, S_B=100MVA)		
			R	X	B
C1	10	25.10	0.0381	0.0554	0.0202
C2	10	24.71	0.0419	0.0594	0.0157
C3	11	25.71	0.0242	0.0311	0.0122
C4	10	24.48	0.0137	0.0186	0.0056

Note: Zero-sequence impedance has not been provided. The connection applicant needs to provide this data upon the IESO's request during the IESO Market Registration process.

3.4 Main Step-Up Transformers

Table 6: Main Step-up Transformer Data

Unit	Transformation	Rating (MVA) (ONAN/ONAF/ONAF)	Positive Sequence Impedance (pu) S_B= 66 MVA	Configuration		ULTC
				HV	LV	
T1	240/34.5kV	66/88/110MVA	0.0086+j0.0745	Yg	Δ	Max tap: 264 kV Min tap: 216 kV Steps: 17

Note: Zero-sequence impedance has not been provided. Typical data was assumed during the SIA. The connection applicant must provide this data during the IESO Market Registration process.

3.5 Connection Equipment

3.5.1 Disconnect Switches

Table 7: Specifications of 230 kV Switches

Identifier	Voltage Rating	Continuous Current Rating	Short Circuit Symmetrical Rating
T1L1-L1, L1-L1L23, L1L23-L23	250 kV	1200 A	63 kA

The proposed switches meet the maximum continuous voltage rating requirement of the Market Rules.

3.5.2 Circuit Breakers

Table 8: Specifications for 230 kV Circuit Breakers

Identifier	Voltage Rating	Interrupting time	Continuous Current Rating	Short Circuit Symmetrical Rating	Short Circuit Asymmetrical Rating
T1L1, L1L23	250 kV	33 ms	1200 A	63 kA	85 kA

The proposed circuit breakers meet the maximum continuous voltage rating requirement of the Market Rules. The interrupting time and short circuit symmetrical duty ratings meet the requirements of the Transmission System Code.

3.5.3 230 kV Tap Line

The project consists of one 230 kV tap line of overhead circuit with the parameters shown in Table 9.

Table 9: Parameters of 230 kV Tap Line

Line	Length (km)	Conductor	Positive-Sequence Impedance (pu, S_B=100 MVA)			Zero-Sequence Impedance (pu, S_B=100 MVA)		
			R	X	B	R	X	B
L1	7	ACSR 795 MCM 26/7	0.001079	0.005206	0.010865	0.00494	0.01687	0.005618

3.6 Wind Farm Control System

The project will be equipped with the High Performance Park Pilot (HPPP) system. This control system is designed to interface with each WTG in the project for regulating system voltage, and active and reactive power for the entire wind farm.

Voltage Control

The voltage control for the project is managed by two control loops. The inner loop controls the 690V system and is carried out by the wind turbine controller at each WTG. The outer loop controls the HV system and is carried out by the HPPP system. The HPPP system receives feedback on the voltage level at the project's connection point. This is compared to the target level by the wind farm controller and voltage references are distributed to each individual wind turbine, to the controllers. This means that the wind turbine's controller responds to the latest reference from the HPPP system and will maintain this on the 690V system.

The voltage control functions enable the project to operate in voltage control mode and control voltage at a point whose impedance (based on rated apparent power and voltage of the project) is not more than 13% from the connection point. Thus, it is acceptable to the IESO.

The function of voltage control meets the requirements of the Market Rules.

Frequency Control

The frequency control for the project is also managed by the HPPP system together with the wind turbine controller at each WTG. The HPPP system distributes active power references to each wind turbine controller. The wind turbine controller responds to the latest reference from the HPPP system and maintains the required active power output.

The project's frequency control is similar to frequency droop control for a conventional rotating generator, and allows for the droop and the deadband of response to be specified. The function of frequency control meets the requirements of the Market Rules.

Inertia Emulation

The inertia emulation feature is currently unavailable for the project's Siemens type SWT-3.2-113 WTGs. The IESO reserves the right to ask the connection applicant to install this function in the future should the function become available for the WTGs.

– End of Section –

4. Short Circuit Assessments

Fault level studies were completed by the transmitter to examine the effects of the project on fault levels at existing facilities in the surrounding area.

4.1 Study Assumptions

(1) All existing generation facilities in-service;
(2) The following committed generation facilities in-service:

- Cedar Point Wind Power Project Phase II
- Grand Bend Wind Farms
- Grand Valley Wind Farms (Phase 3)
- Armow
- Henvey Inlet Wind Farm
- Gunn's Hill Wind Farm
- Southgate Solar
- Niagara Region Wind Farm
- Beck #1 G1 and G2 Project
- Windsor Solar

(3) The following existing and committed embedded generation in-service:

- Southwest area: 733 MW
- West area: 764 MW
- Niagara area: 136 MW
- Bruce area: 28 MW
- Toronto area: 782 MW
- Essa area: 431 MW

(4) Relevant system operation conditions:

- Claireville TS 230 kV operated ***open***
- Leaside TS 230 kV operated ***open***
- Leaside TS 115 kV operated ***open***
- Middleport TS 230 kV bus operated ***open***
- Napanee TS 230 kV operated ***open***
- Cherrywood TS north & south 230kV buses operated ***open***
- Richview TS 230 kV bus operated ***open***
- All tie-lines in-service and phase shifters on neutral taps
- Maximum voltages on the buses

4.2 Study Results

Tables 15 and 16, in Appendix A, summarize the fault levels at facilities near the project with and without the project. Simulation results show all fault levels do not exceed the interrupting capability of the lowest rated circuit breaker at stations near the project. The interrupting capability of the project's 230 kV circuit breakers is also adequate. No short circuit issues are foreseen with the incorporation of the project.

– End of Section –

5. System Impact Assessments

The technical studies focused on identifying the impact of the project on the reliability of the integrated power system. It includes thermal loading assessment of transmission circuits, system voltage assessment of local buses, transient stability assessment of the project and major surrounding generation units. The section also assesses the reactive power capability of the project and identifies the need of reactive power compensation to meet the Market Rules requirements.

5.1 Local Transmission System

The West zone system of the IESO-controlled grid (ICG) refers to the part of the ICG between the Buchanan 230/115 kV system and the Ontario to Michigan tie lines. It consists of several large and moderately sized generation facilities and both residential and industrial load. Under periods of low generation in the West zone and/or high exports into Michigan from Ontario, active power is transferred into the West zone through the BLIP (Buchanan-Longwood Input Power) interface. Under periods of high generation and/or imports into Ontario from Michigan, active power is transferred out of the West zone through the NBLIP (Negative BLIP) interface and into Southwestern Ontario and the Greater Toronto Area (GTA).

Generation resources in the West zone are abundant and consist of various natural gas generation facilities located mostly around the Lambton, Sarnia-Scott and Windsor areas, as well as wind generation facilities which are mostly located around the Chatham area.

The Ontario-Michigan interface is equipped with four phase angle regulators located on four individual tie lines. Export/Import capability through the interface is limited by the thermal capacity of the four intertie circuits.

The active power transfer across the BLIP/NBLIP interface is limited by post-contingency voltage collapse issues related to contingencies causing the loss of major 500 kV circuits emanating from the Bruce nuclear complex (Bruce GS A and Bruce GS B). Transfers across the BLIP/NBLIP interface are inversely interrelated with the amount of generation transferred from the Bruce nuclear complex. The Western zone is also characterized by a host of local area issues related to post-contingency voltage decline and thermal overloading. To help mitigate local area reliability concerns, the West zone is equipped with three special protection schemes (SPS) used to automatically reject various western loads and generation. These special protection schemes are located at Sarnia-Scott TS – “Sarnia Scott Generation Rejection (G/R) Scheme”, Lambton TS – “Lambton Generation Rejection (G/R) Scheme” and Keith/Lauzon/Kingsville TS – “Windsor Area Special Protection Scheme”.

An overview of the West zone system is shown in Figure 3. The project will be connected to the 230 kV circuit C23Z, one of the four 230 kV circuits supplying the load in the Windsor-Essex area from Chatham SS.

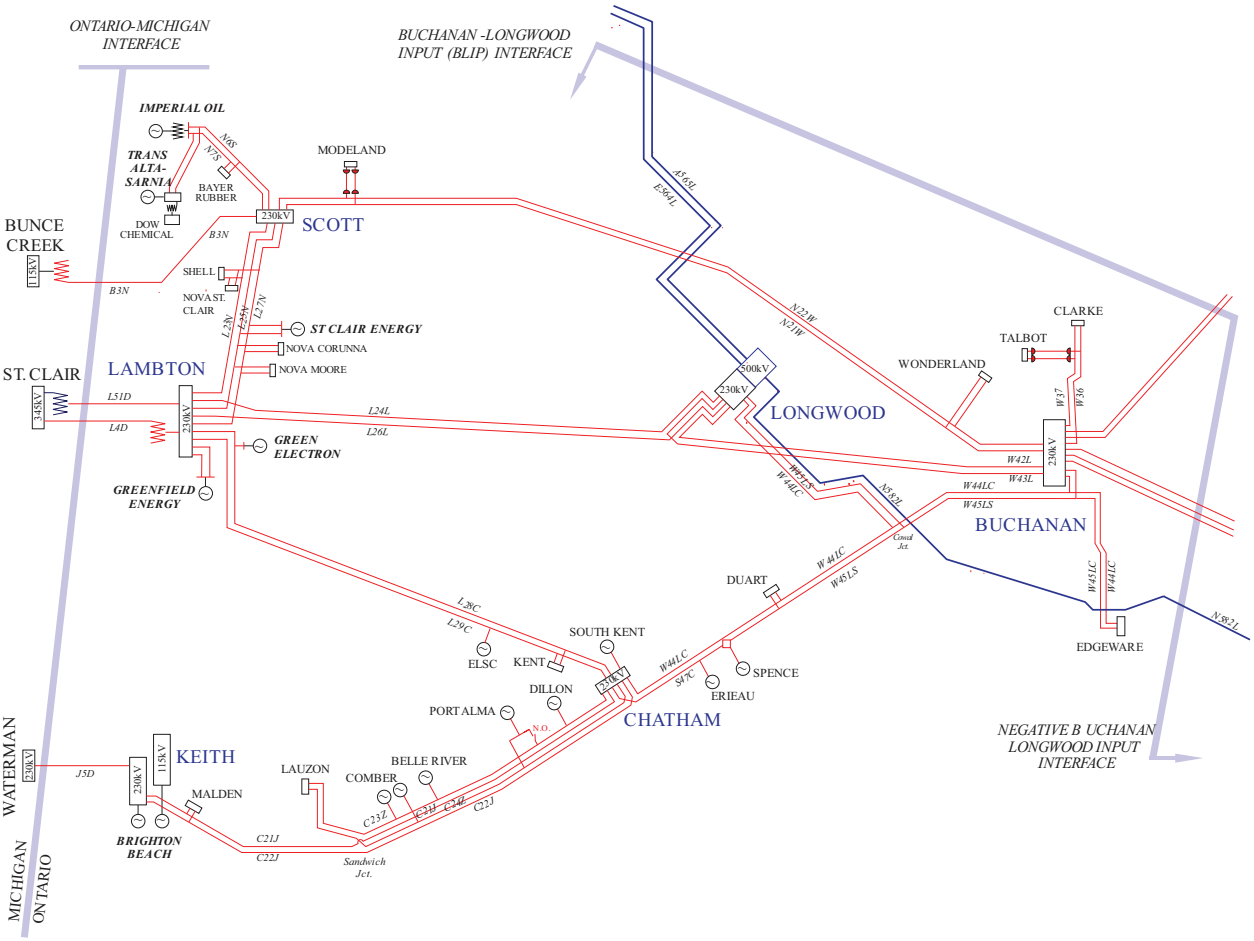


Figure 3: Local Transmission System in the Vicinity of the Project

5.2 Study Assumptions

The following study assumptions were used as per the Ontario Resource and Transmission Assessment Criteria (ORTAC) requirements and are intended to simulate operations under reasonable worst-case scenarios:

(1) **Transmission facilities**: All existing and committed major transmission facilities with 2016 in-service dates or earlier were assumed in-service. The committed transmission facilities are outlined in the short circuit assumptions in Section 4.

(2) **Generation facilities:** All existing and committed major generation facilities with 2016 in-service dates or earlier were assumed in-service. The committed generation facilities are outlined in the short circuit assumptions in Section 4.

(3) **Protection changes:** The required adjustments to the existing transmission protection systems for incorporating the project were proposed in the PIA report (Appendix D). Specifically, the project will not change the fault clearing time.

(4) **Import/Export:** All four Michigan-Ontario phase shifters in-service and regulating import and export between the two systems to zero.

(5) **Load forecast:** Two different load levels for the West zone were considered for the SIA studies and are summarized in Table 10. Specifically, the peak load data is normal weather monthly coincident summer peak load net embedded generation and conservation.

Table 10: Load Levels Used for Studies (MW)

Load	System Demand (MW)	West Zone Demand (MW)
Normal Summer Peak Load	24923	2388
Light Load	12410	1155

(6) **Base cases:** Using the above load levels, the following three base cases were developed:

Light Load Case:

- Developed from a historical system light load condition;
- All wind generation in the West zone dispatched in-service with maximum output;
- All gas generation in the West zone dispatched out of service;
- Used only for voltage assessment studies.

Summer Congested Case:

- System demand and West zone demand scaled to normal summer peak value;
- Gas and wind generation in the West zone maximized;
- Used for transient, voltage, and thermal assessment studies for 230 kV circuits supplying the Windsor-Essex area load from Chatham SS.

Summer Non-Congested Case:

- Developed from the above summer congested case;
- Gas generation in the West zone scaled down to respect post-contingency thermal planning rating of 230 kV transmission circuits in the West zone following the loss of W44LC;
- Used only for thermal assessment studies.

The relevant interface flows for the base cases before the incorporation of the project have been summarized in Table 11. Generation in the GTA was dispatched down to allow the incorporation of the project's generation for all the base cases.

Table 11: Interface Flows for Base Cases (MW)

Base Case	NBLIP	FABC
Light Load Case	100	2335
Summer Congested Case	1990	6410
Summer Non-Congested Case	1310	6410

5.3 Reactive Power Compensation

Appendix 4.2 of the Market Rules require that a generation facility injects or withdraws reactive power continuously at its connection point up to 33% of its rated active power at all levels of active power output except where a lesser continually available capability is permitted by the IESO. A generating unit with a power factor range of 0.90 lagging and 0.95 leading at rated active power connected via impedance between the generator and the connection point not greater than 13% based on rated apparent power provides the required range of dynamic reactive power capability at the connection point.

Dynamic reactive compensation (e.g. STATCOM or SVC) is required for a generation facility which employs generating unit(s) that cannot provide a reactive power range of 0.90 lagging power factor and 0.95 leading power factor at rated active power. For a wind generation facility with impedance between the WTGs and the connection point greater than 13% based on rated apparent power, provided each WTG

have the capability to provide a reactive power range of 0.90 lagging power factor and 0.95 leading power factor at rated active power, the IESO accepts compensation for excessive reactive power losses in the facility's connection system with static shunts (e.g. capacitors and reactors).

In addition, a wind generation facility is expected to inject or withdraw its full reactive power requirement for a 10% voltage change at its connection point, without provision for tap changer action. The response time is expected to be similar to that of a synchronous generator that meets the minimum Market Rules requirements, outlined in Appendix 4.2 of the Market Rules, which is in the order of a few seconds.

The connection applicant shall be able to confirm the required reactive power capabilities during the commission tests.

5.3.1 Dynamic Reactive Power Capability

The project's Siemens SWT-3.2-113 WTGs, as specified in Section 3.2, can deliver IESO's required dynamic reactive power at their generator terminals. Thus, the connection applicant is not required to install any additional dynamic reactive power compensation at the project.

5.3.2 Static Reactive Power Capability

The project shall inject or withdraw reactive power at its connection point up to 33% of its rated active power at all levels of active power output, which is **33 Mvar** for this project.

(1) Capacitive (Inject) Reactive Power Capability

The need for additional static capacitive reactive power compensation was assessed under maximum active power output from the project. Studies were performed with the following simulation conditions:

- A typical low voltage of 236 kV at the connection point;
- Maximum terminal voltage of 1.05 pu for the WTGs, whose reactive power capability is adjusted to values on the curve for 1.05*Un in Figure 2;
- ULTC tap position of 249 kV (Tap 11) at the main step-up transformers T1 (assuming provision for tap changer action).

Study results show that the project could supply a maximum reactive power of **36.9 Mvar** at the connection point, meeting the Market Rules requirement.

Studies were also performed for a connection point voltage of 220 kV with ULTC tap position for transformers T1 set to 237 kV (Tap 7) (assuming no provision for tap changer action). The project could supply a maximum reactive power of **38.3 Mvar** at the connection point, meeting the Market Rules requirement.

(2) **Inductive (Withdraw) Reactive Power Capability**

The need for additional static inductive reactive power compensation was assessed under both maximum and zero active power output conditions from the project as the WTGs absorb less reactive power at maximum active power output. Studies were performed with the following simulations:

- A typical high voltage of 244 kV at the connection point;
- Minimum terminal voltage limit of 0.95 pu at the WTGs, whose reactive power capability is adjusted to values on the curve for 0.95*Un in Figure 2;
- ULTC tap position of 237 kV (Tap 7) at the main step-up transformers T1 (assuming no provision for tap changer action);

With maximum and zero active power output from the project, studies show that the project could withdraw a maximum reactive power of **69.2 Mvar** and **45.3 Mvar** at the connection point, respectively, meeting the Market Rules requirement.

Table 12 summarizes the project's reactive power capabilities and internal voltage levels for the above scenarios allowing tap changer action. The IESO's reactive power calculation used the equivalent electrical model of the project's collection system (WTGs, unit step-up transformers and collector feeders) as provided by the connection applicant. The equivalent model cannot accurately represent the voltage at each individual WTG. When deployed, some WTGs may reach the limit of their terminal voltage before injecting or withdrawing their maximum reactive power. The connection applicant should ensure, during the detailed design of the project, that the WTGs are not limited in their capability to produce reactive power due to terminal voltage limits or other project's internal limitations. For example, it is expected that the transformation ratio of the WTG step up transformers will be set in such a way that it will offset the voltage profile along the collector, and all the WTGs would be able to contribute to the reactive power production of the project in a shared amount.

Table 12: Project's Reactive Power Capabilities at the Connection Point

Operation	Reactive power at connection point (Mvar)	Voltage at connection point (kV)	Tap of Transformer T1 (kV)	230 kV voltage at Joe Byrne substation (kV)	34.5 kV voltage at Joe Byrne substation (kV)
P=Max, Lagging PF	**36.9**	236	249	236.6	34.9
P=Max, Leading PF	**69.2**	244	237	243.5	33.5
P=0, Leading PF	**45.3**	244	237	243.5	33.7

(3) Zero Active Power Output Conditions

The project shall be capable of reducing the reactive power injection at the connection point to zero under zero active power output conditions. This would require adequate reactive power absorption capability to compensate the reactive charging of the project when the WTGs are not producing active power.

When the WTGs are not producing active power, the project would provide **7.5 Mvar** of reactive power charging into the system at the connection point, which may aggravate the high-voltage situations under some system conditions. The project shall be capable of reducing the reactive power injection at the connection point to zero at the request of the IESO. Should this situation arise, the IESO will direct the project to reduce this injection. This may be obtained by installing at the project a shunt reactor of appropriate size, enhancing the project's WTGs with reactive power at no wind option, or disconnecting manually the project's collectors when in operation. Shall the project fail to meet the IESO's direction, the IESO reserves the right to ask the connection applicant to disconnect the project from the IESO-controlled grid.

5.4 Thermal Analysis

The ORTAC specifies the following criteria for thermal loading of transmission facilities:

(1) Continuous ratings are used for pre-contingency equipment loading with all planned transmission facilities in-service,
(2) Long-term emergency (LTE) ratings are used with any one element out of service (planned or unplanned), and
(3) Short-term emergency (STE) ratings are used with more than one element out of service (unplanned).

Where circuits and transformers may be loaded up to their STE ratings, system adjustments must be available to reduce their loading to within the LTE ratings within 15 minutes, the time afforded by their STE ratings.

Thermal analysis was performed to ensure that the local transmission system meets the above criteria after the project is incorporated. Ratings of circuits and transformers used in this thermal assessment were provided by the transmitter.

(1) 230 kV Circuits Supplying the Windsor-Essex area Load

As the project will connect to one of the 230 kV circuits supplying the Windsor-Essex area load, i.e. circuits C21J, C22J, C23Z, and C24Z, thermal assessment was firstly done to assess the project's impact on these circuits. The defined summer congested case outlined in Section 5.2 was used.

Table 17, Appendix B, shows the thermal results before and after the project connected. The loading of all circuits is well below their continuous ratings after the incorporation of the project.

The following two contingencies not involving loss of the project by configuration were studied:

- Loss of C24Z;
- Loss of C21J and C22J.

Table 18, in Appendix B, shows the post-contingency thermal loading results. For all circuits, the loading is within their LTE ratings.

(2) Other 230 kV Circuits in the West Zone

Simulation studies show existing pre- and post-contingency thermal violations on sections of 230 kV circuits L24L, L26L, N21W, N22W, W44LC, S47C and W45LS.

Based on the study results, the most critical contingencies for the existing West zone in terms of circuit thermal performance are:

(1) Loss of W44LC;
(2) Loss of W44LC and W45LS;

Contingencies involving circuit(s) emanating from Lambton TS and Sarnia-Scott TS were not studied as they are included in the existing Sarnia-Scott G/R SPS and Lambton G/R SPS.

In order to eliminate the thermal violation issues in the summer congested case (before the incorporation of the project), generation in the West zone needed to be dispatched down. For this SIA study, gas generation was chosen to be scaled down until both pre-contingency and post-contingency thermal violation issues were addressed. This lead to the summer non-congested base case as outlined in Section 5.2.

Table 19, Appendix B, shows the thermal results of the summer non-congested case before the incorporation of the project. Of the pre-contingency scenario and two post-contingency scenarios, the post-contingency scenario following loss of W44LC is identified as the most limiting in terms of highest thermal loading of the 230 kV circuits. The section between Spence SS and Duart Junction of circuit W44LS is subject to the highest post-contingency loading.

Table 20 Appendix B, shows the thermal results after the incorporation of the project based on the summer non-congested case. There is pre-contingency overloading on circuit W45LS and post-contingency overloading on this circuit as well following loss of W44LC. The project increases both pre- and post-contingency power flows of these circuits, thus increases congestion. As such, the connection applicant may need to curtail the output of the project for reliability purposes.

5.5 Voltage Analysis

The *Ontario Resource and Transmission Assessment Criteria (ORTAC)* states that with all facilities in service pre-contingency, the following criteria shall be satisfied:

- The pre-contingency voltage on 230 kV buses must not be less than 220 kV or greater than 250 kV;
- The post-contingency voltage on 230 kV buses must not be less than 207 kV or greater than 250 kV;
- The voltage change following a contingency must not exceed 10% pre-ULTC and 10% post-ULTC.

The voltage performance of the IESO-controlled grid was evaluated by examining if pre- and post-contingency voltage levels and post-contingency voltage changes remain within criteria at various facilities.

Contingencies were simulated using both the defined summer congested and light load base cases after the incorporation of the project. Four contingencies were simulated: (1) loss of the project; (2) loss of 230 kV circuit C23Z; (3) loss of 230 kV circuits C23Z and C24Z; and (4) loss of 230 kV circuits W44LC and W45LS. The first three contingencies involve the loss of the project while the fourth is the worst-case contingency in terms of voltage performance in the Chatham area.

The study results are shown in Tables 21 and 22, Appendix B. They indicate that all voltage criteria are met and there are no voltage concerns with the incorporation of the project.

5.6 Transient Stability Performance

Transient stability simulations were completed to determine if the power system will be transiently stable with the incorporation of the project for design contingencies specified in ORTAC. In particular, rotor angles of generators at Greenfield Energy Centre CGS, St. Clair Power CGS, Sarnia CGS and Brighton Beach CGS were monitored. The summer congested case outlined in Section 5.2 was used. All simulated contingencies are shown in Table 19.

Table 13: Simulated Contingencies for Transient Stability

ID	Contingency	Location	Fault Type	Fault Clearing Time (ms)	
				Local	Remote
SC1	W44LC + W45LS	Longwood	LLG	75	91 @ Chatham, 108 @ Buchanan
				90	98 @ Spence, 131 @ Buchanan
SC2	L24L + L26L	Lambton	LLG	66	100
SC3	C24Z	Chatham	3 phase	81	106
SC4	C21J+C22J	Chatham	LLG	81	106
SC5	The project	LV Collector Bus	3 phase	Uncleared	

Figures 4 – 13, Appendix C show the transient responses of major generator rotor angles and bus voltages. The transient responses show that the generators remain synchronized to the power system and the oscillations are sufficiently damped following all simulated contingencies. It can be concluded that, with the project in-service, none of the simulated contingencies caused transient instability or un-damped oscillations.

5.7 Voltage Ride-Through (VRT) Analysis

The IESO requires that the project's WTGs and connection equipment be able to withstand transient voltages and remain connected to the IESO-controlled grid following design criteria contingencies in ORTAC, unless the generators are removed from service by configuration. This requirement is commonly referred to as the voltage ride-through (VRT) capability.

The low VRT capability of the WTGs, specified in Section 3.2, was assessed using the terminal voltages of the WTGs under simulated contingencies SC1 – SC4 in Table 13. To cover scenarios with the longest duration of low transient voltage levels, one additional contingency SC6 involving delayed fault clearing for 230 kV circuit C24Z, as shown in Table 14, was also assessed.

Table 14: Additional Simulated Contingencies for Voltage Ride-through Capability

ID	Contingency	Location	Fault Type	Fault Clearing Time (ms)	
				Local	Remote
SC6	C24Z	Chatham	LG+L24L28 BF at Chatham	192	Lauzon (C24Z):106; Longwood (L28C): 207

Figure 14, in Appendix C, shows the terminal voltage responses of the WTGs at collector C2, which have the lowest transient voltage. They show that the terminal voltages of the WTGs recover above 0.9 pu immediately following the fault clearance, which is within 400 ms after the fault inception. As compared with the low VRT capability in Table 3, the project's WTGs are expected to remain connected to the IESO-controlled grid for contingencies that do not remove the project by configuration.

However, after the project is incorporated into the IESO-controlled grid, if actual operation shows that the WTGs trip for out of zone faults, the IESO will require the voltage ride-through capability be enhanced by the connection applicant to prevent such tripping. The voltage ride-through capability must also be demonstrated during commissioning by either providing manufacturer test results or monitoring several variables under a set of IESO specified field tests, and the results must be verifiable using a PSS/E model of the WTGs.

5.8 Relay Margin

As per the transmitter's PIA report in Appendix D, the zone 2 line protection reach for C23Z at Lauzon TS needs to be reduced while the zone 2 reach at Chatham SS needs to be slightly increased. The protections at both ends will still uses a DCB scheme.

A relay margin test was performed to check the setting for C23Z at Chatham SS, given the increased zone 2 reach on this circuit. For a worst case scenario, the following simulation conditions were adopted:

- The defined summer congested case was used;
- Generation facilities in Windsor-Essex area as well as wind generating facilities on C23Z and C24Z were dispatched out of service;
- A 3-phase fault was applied on C24Z close to Chatham SS.

Figure 15, in Appendix C, shows the impedance trajectory of C23Z at Chatham SS following the contingency, as well as the relay characteristics of C23Z at Chatham SS. The impedance trajectory is far away from the relay characteristics, meeting the Market Rules requirement.

As such, the protection adjustments needed to incorporate the project, as proposed in the PIA report, are acceptable to the IESO.

– End of Section –

Appendix A: Short Circuit Results

Table 15: Short Circuit Results before the incorporation of the Project

Bus	Base kV	3-phase (kA)		L-G fault (kA)		Lowest Breaker Rating (kA)	
		Symmetrical	Asymmetrical	Symmetrical	Asymmetrical	Symmetrical	Asymmetrical
BUCHANAN	220	32.04	37.91	27.55	34.81	39.4	46.2
CHATHAM	220	25.25	30.82	21.85	26.43	40	46.9
LAUZON	118	21.59	24.59	24.21	28.72	38.8	45.5
ESSEX	118	23.37	27.27	24.66	29.13	41.7	50
KEITH	220	19.39	27.53	21.15	30.20	63	78.8
KEITH	118	24.15	28.16	28.34	35.23	42.2	45.5
LAMBTON P1K1	220	37.98	51.18	36.48	47.40	63	80
LAMBTON P2K2	220	35.52	49.02	35.84	48.99	63	80
SPENCE CSS	220	13.55	16.24	10.93	12.81	63	81.9
LONGWOOD	220	36.95	45.41	44.52	57.81	63	73.9

Table 16: Short Circuit Results after the incorporation of the Project

Bus	Base kV	3-phase (kA)		L-G fault (kA)		Lowest Breaker Rating (kA)	
		Symmetrical	Asymmetrical	Symmetrical	Asymmetrical	Symmetrical	Asymmetrical
BUCHANAN	220	32.05	37.92	27.56	34.82	39.4	46.2
CHATHAM	220	25.50	31.08	22.00	26.58	40	46.9
LAUZON	118	21.80	24.84	24.44	28.99	38.8	45.5
ESSEX	118	23.54	27.45	24.79	29.27	41.7	50
KEITH	220	19.42	27.58	21.18	30.24	63	78.8
KEITH	118	24.24	28.25	28.42	35.31	42.2	45.5
LAMBTON P1K1	220	37.99	51.20	36.49	47.41	63	80
LAMBTON P2K2	220	35.54	49.04	35.85	49.00	63	80
SPENCE CSS	220	13.60	16.28	10.95	12.83	63	81.9
LONGWOOD	220	36.97	45.44	44.54	57.84	63	73.9
THE PROJECT	220	8.42	10.30	9.00	11.09	63	85

Appendix B: Thermal and Voltage Results

Table 17: Thermal Loading Change under Peak Load Conditions for 230 kV Circuits from Chatham SS to Windsor-Essex Area

Circuit	Section		Cont. Rating (A)	Before Project			After Project			Δ
	From	To		MW	Mvar	% of Cont.	MW	Mvar	% of Cont.	% of Cont.
C23Z	Chatham SS	Dillon RWEC JCT	1060	-119.5	92.6	34.2	-187.4	104.8	48.8	14.6
C23Z	Dillon RWEC JCT	KEPA WF JCT	1060	-44.8	47.4	14.9	-113.0	58.3	29.2	14.3
C23Z	KEPA W JCT	Comber WF JCT	1060	-44.9	49.2	15.3	-113.2	58.9	29.4	14.1
C23Z	Comber WF JCT	Belle River JCT	1060	34.5	0.2	8.0	-34.1	7.6	8.1	0.2
C23Z	Belle River JCT	Sandwich JCT	1060	34.4	1.0	8.0	63.4	-5.3	14.8	6.8
C23Z	Sandwich JCT	Lauzon TS	1060	34.4	4.5	8.0	63.3	-2.3	14.7	6.7
C24Z	Chatham SS	KEPA WF JCT	840	-200.4	134.9	69.0	-214.1	133.0	72.3	3.3
C24Z	KEPA WF JCT	Comber WF JCT	840	-8.2	35.0	10.5	-22.0	33.9	11.8	1.3
C24Z	Comber WF JCT	Sandwich JCT	840	71.2	-13.8	21.3	57.4	-13.7	17.4	-3.9
C24Z	Sandwich JCT	Lauzon TS	1060	71.0	-10.5	16.7	57.3	-10.1	13.6	-3.1
C21J	Chatham SS	Sandwich JCT	1060	-103.6	53.2	26.4	-108.7	50.6	27.3	0.9
C21J	Sandwich JCT	Malden JCT	840	-104.6	58.1	35.1	-109.8	54.9	36.1	1.0
C21J	Malden JCT	Keith TS	840	-159.5	52.6	49.6	-164.7	49.2	50.8	1.2
C22J	Chatham SS	Sandwich JCT	840	-100.0	55.9	32.7	-105.2	53.5	33.8	1.1
C22J	Sandwich JCT	Malden JCT	840	-101.4	60.7	34.6	-106.6	57.8	35.6	1.0
C22J	Malden JCT	Keith TS	840	-156.6	55.2	49.0	-161.9	52.0	50.3	1.2

Table 18: Contingency Results under Peak Load Conditions for 230 kV Circuits from Chatham SS to Windsor-Essex Area

Circuit	Section		LTE. Rating (A)	Loss of C24Z			Loss of C21J and C22J		
	From	To		MW	Mvar	% of LTE	MW	Mvar	% of LTE
C23Z	Chatham SS	Dillon RWEC JCT	1400	-158.5	115.9	33.3	-290.5	143.7	55.6
C23Z	Dillon RWEC JCT	KEPA WF JCT	1400	-84.1	66.8	18.4	-216.9	90.3	40.8
C23Z	KEPA W JCT	Comber WF JCT	1400	-84.2	67.9	18.7	-217.6	86.9	40.9
C23Z	Comber WF JCT	Belle River JCT	1400	-5.0	17.8	3.2	-139.3	28.6	25.1
C23Z	Belle River JCT	Sandwich JCT	1400	92.6	0.6	16.2	-41.9	16.9	8.0
C23Z	Sandwich JCT	Lauzon TS	1400	92.4	2.8	16.2	-41.9	20.1	8.2
C24Z	Chatham SS	KEPA WF JCT	1020	-	-	-	-314.0	173.5	84.4
C24Z	KEPA WF JCT	Comber WF JCT	1040	-	-	-	-124.2	60.5	32.7
C24Z	Comber WF JCT	Sandwich JCT	1040	-	-	-	-45.3	12.2	11.2
C24Z	Sandwich JCT	Lauzon TS	1400	-	-	-	-45.4	16.1	8.5
C21J	Chatham SS	Sandwich JCT	1370	-95.6	60.5	19.6	-	-	-
C21J	Sandwich JCT	Malden JCT	1020	-96.5	66.1	28.1	-	-	-
C21J	Malden JCT	Keith TS	1020	-151.4	60.9	39.6	-	-	-
C22J	Chatham SS	Sandwich JCT	1020	-91.9	62.8	25.9	-	-	-
C22J	Sandwich JCT	Malden JCT	1050	-93.1	68.3	27.0	-	-	-
C22J	Malden JCT	Keith TS	1020	-148.4	63.1	39.1	-	-	-

Table 19: Thermal Results for West Zone Before the Project

Circuit	Section		Cont. Rating (A)	LTE Rating (A)	STE Rating (A)	All In-Service			Loss of W44LC			Loss of W44LC and W45LS		
	From	To				MW	Mvar	% of Cont.	MW	Mvar	% of LTE	MW	Mvar	% of STE
L24L	Lambton TS	Longwood TS	1060	1400	1900	344	-48	79.9	401	-54	70.9	344	-48	44.6
L26L	Lambton TS	Longwood TS	1060	1350	1880	361	-38	82.8	424	-41	76.8	361	-38	46.7
L28C	Lambton TS	Green Electron JCT	1060	1330	1510	-179	-50	42.5	-296	-48	54.9	-179	-50	29.8
L28C	Green Electron JCT	Lynwood JCT	1060	1330	1510	40	-29	11.4	-77	-15	14.3	40	-29	8.0
L28C	Lynwood JCT	Chatham SS	1060	1330	1510	-25	-28	8.5	-142	-16	25.9	-25	-28	5.9
L29C	Lambton TS	Lynwood JCT	1060	1400	1730	-32	-34	10.8	-154	-17	27.1	-32	-34	6.6
L29C	Lynwood JCT	ELSC JCT	1060	1400	1730	64	-46	17.9	-59	-36	12.0	64	-46	10.9
L29C	ELSC JCT	Chatham SS	1060	1400	1730	0	-50	11.3	-124	-40	22.3	0	-50	6.9
N21W	Sarnia Scott TS	Lucasville JCT	1290	1700	2170	395	-23	75.4	450	-14	65.5	395	-23	44.8
N21W	Lucasville JCT	Bostwick Rd JCT	1060	1330	1510	351	-43	82.0	406	-35	75.8	351	-43	57.5
N21W	Bostwick Rd JCT	Buchanan TS	1090	1330	1490	291	-120	68.7	342	-146	66.9	291	-120	50.2
N22W	Sarnia Scott TS	Lucasville JCT	1290	1700	2170	397	-23	75.7	452	-13	65.8	397	-23	45.0
N22W	Lucasville JCT	Bostwick Rd JCT	1060	1400	1610	350	-44	81.9	406	-35	72.0	350	-44	53.9
N22W	Bostwick Rd JCT	Buchanan TS	1090	1330	1490	300	-117	70.2	351	-143	68.1	300	-117	51.4
W44LC	Chatham SS	Duart JCT	1110	1460	2080	407	-10	87.7	-	-	-	-	-	-
W44LC	Duart JCT	Cowal JCT	1110	1460	2080	401	-50	87.4	-	-	-	-	-	-
W44LC	Cowal JCT	Longwood TS	1350	1800	2170	37	-41	9.8	-	-	-	-	-	-
W44LC	Cowal JCT	Buchanan TS	1110	1460	2080	359	-50	77.7	-	-	-	-	-	-
S47C	Chatham SS	Erieau JCT	1110	1460	2080	241	43	52.8	404	69	67.4	241	43	28.2
S47C	Erieau Jct	Spence SS	1110	1460	2080	338	49	73.5	500	79	83.4	338	49	39.2
W45LS	Spence SS	Duart JCT	1110	1460	2080	431	-57	94.8	591	-53	***99.6***	-	-	-
W45LS	Duart JCT	Cowal JCT	1110	1460	2080	421	-69	93.0	578	-83	98.0	-	-	-
W45LS	Cowal JCT	Longwood TS	1350	1800	2170	50	-56	13.3	102	-111	20.1	-	-	-
W45LS	Cowal JCT	Buchanan TS	1110	1460	2080	366	-59	79.7	466	-68	77.3	-	-	-

Table 20: Thermal Results for West Zone After the Project

Circuit	Section		Cont. Rating (A)	LTE Rating (A)	STE Rating (A)	All In-Service			Loss of W44LC			Loss of W44LC and W45LS		
	From	To				MW	Mvar	% of Cont.	MW	Mvar	% of LTE	MW	Mvar	% of STE
L24L	Lambton TS	Longwood TS	1060	1400	1900	355	-53	82.6	418	-49	73.8	533	-24	69.3
L26L	Lambton TS	Longwood TS	1060	1350	1880	372	-42	85.7	442	-36	80.0	569	-5	74.1
L28C	Lambton TS	Green Electron JCT	1060	1330	1510	-199	-51	47.1	-325	-43	60.1	-529	-16	85.8
L28C	Green Electron JCT	Lynwood JCT	1060	1330	1510	20	-25	7.3	-106	-7	19.4	-311	27	50.4
L28C	Lynwood JCT	Chatham SS	1060	1330	1510	-45	-23	11.4	-171	-10	31.1	-381	-15	60.9
L29C	Lambton TS	Lynwood JCT	1060	1400	1730	-53	-30	14.0	-184	-8	32.2	-398	37	57.0
L29C	Lynwood JCT	ELSC JCT	1060	1400	1730	43	-42	13.7	-89	-30	16.3	-308	-26	43.7
L29C	ELSC JCT	Chatham SS	1060	1400	1730	-21	-46	11.5	-153	-35	27.2	-374	-45	52.6
N21W	Sarnia Scott TS	Lucasville JCT	1290	1700	2170	401	-23	76.7	462	-10	67.3	559	12	64.3
N21W	Lucasville JCT	Bostwick Road JCT	1060	1330	1510	357	-43	83.6	417	-31	78.0	515	-10	85.1
N21W	Bostwick Road JCT	Buchanan TS	1090	1330	1490	297	-124	70.3	353	-148	68.9	442	-204	78.4
N22W	Sarnia Scott TS	Lucasville JCT	1290	1700	2170	403	-22	77.0	463	-9	67.5	561	13	64.5
N22W	Lucasville JCT	Bostwick Road JCT	1060	1400	1610	357	-43	83.5	417	-31	74.0	515	-11	79.8
N22W	Bostwick Road JCT	Buchanan TS	1090	1330	1490	305	-121	71.8	361	-149	70.3	451	-201	79.5
W44LC	Chatham SS	Duart JCT	1110	1460	2080	433	-11	93.7	-	-	-	-	-	-
W44LC	Duart JCT	Cowal JCT	1110	1460	2080	427	-57	93.4	-	-	-	-	-	-
W44LC	Cowal JCT	Longwood TS	1350	1800	2170	53	-56	13.5	-	-	-	-	-	-
W44LC	Cowal JCT	Buchanan TS	1110	1460	2080	369	-49	79.8	-	-	-	-	-	-
S47C	Chatham SS	Erieau JCT	1110	1460	2080	267	39	58.3	442	76	74.0	-191	77	23.9
S47C	Erieau Jct	Spence SS	1110	1460	2080	364	48	79.3	538	89	90.1	-95	90	15.1
W45LS	Spence SS	Duart JCT	1110	1460	2080	456	-62	**100.9**	628	-50	**106.3**	-	-	-
W45LS	Duart JCT	Cowal JCT	1110	1460	2080	447	-76	99.1	615	-84	**104.8**	-	-	-
W45LS	Cowal JCT	Longwood TS	1350	1800	2170	65	-71	17.0	124	-121	23.2	-	-	-
W45LS	Cowal JCT	Buchanan TS	1110	1460	2080	375	-58	81.7	478	-74	79.8	-	-	-

Table 21: Voltage Analysis Results under Peak Load Conditions

Bus Name	Pre-Cont.	Loss of the Project				Loss of C23Z				Loss of C23Z and C24Z				Loss of W44LC+W45LS			
		Pre-ULTC		Post-ULTC		Pre-ULTC		Post-ULTC		Pre-ULTC		Post-ULTC		Pre-ULTC		Post-ULTC	
	V (kV)	V (kV)	Δ (%)	V (kV)	Δ (%)	V (kV)	Δ (%)	V (kV)	Δ (%)	V (kV)	Δ (%)	V (kV)	Δ (%)	V (kV)	Δ (%)	V (kV)	Δ (%)
LONGWOOD 230kV	247.5	247.8	0.1	248.1	0.3	248.5	0.4	249.6	0.8	247.5	0.0	249.5	0.8	245.6	-0.8	243.6	-1.6
BUCHANAN 230 kV	247.2	247.5	0.1	248.0	0.3	248.3	0.4	249.7	1.0	247.2	0.0	249.4	0.9	245.8	-0.6	243.5	-1.5
CHATHAM 230 kV	243.1	243.7	0.2	244.0	0.4	245.4	1.0	246.3	1.3	243.1	0.0	248.8	2.4	242.8	-0.1	241.3	-0.7
LAMBTON_P1K1 230 kV	236.8	236.9	0.1	237.1	0.1	237.3	0.2	237.7	0.4	236.8	0.0	238.1	0.5	233.7	-1.3	231.2	-2.4
LAMBTON_P2K2 230 kV	238.5	238.6	0.1	238.8	0.1	239.0	0.2	239.4	0.4	238.5	0.0	239.7	0.5	235.7	-1.2	233.2	-2.2
KEITH 230 kV	236.6	236.9	0.1	237.1	0.2	237.5	0.4	237.8	0.5	236.6	0.0	238.7	0.9	235.5	-0.4	235.0	-0.7
LAUZON C23Z 230 kV	238.2	239.3	0.5	239.5	0.5	237.7	-0.2	238.2	0.0	-	-	-	-	237.8	-0.2	237.1	-0.5
LAUZON C24Z 230 kV	238.2	238.6	0.2	238.8	0.3	238.3	0.1	238.7	0.2	-	-	-	-	237.7	-0.2	236.9	-0.5
KEITH 115kV	124.8	124.9	0.1	125.0	0.2	124.9	0.1	125.0	0.2	124.8	0.0	125.0	0.2	124.5	-0.2	124.3	-0.4
LAUZON 115kV	125.6	125.8	0.2	125.9	0.3	125.4	-0.1	125.6	0.1	125.6	0.0	125.4	-0.1	125.5	-0.1	125.1	-0.4

Table 22: Voltage Analysis Results under Light Load Conditions

Bus Name	Pre-Cont.	Loss of the Project				Loss of C23Z				Loss of C23Z and C24Z				Loss of W44LC+W45LS			
		Pre-ULTC		Post-ULTC		Pre-ULTC		Post-ULTC		Pre-ULTC		Post-ULTC		Pre-ULTC		Post-ULTC	
	V (kV)	V (kV)	Δ (%)	V (kV)	Δ (%)	V (kV)	Δ (%)	V (kV)	Δ (%)	V (kV)	Δ (%)	V (kV)	Δ (%)	V (kV)	Δ (%)	V (kV)	Δ (%)
LONGWOOD 230kV	246.7	246.9	0.1	246.9	0.1	247.4	0.3	247.4	0.3	248.3	0.7	248.2	0.6	247.6	0.4	246.2	-0.2
BUCHANAN 230 kV	245.4	245.6	0.1	245.6	0.1	246.0	0.3	246.1	0.3	247.0	0.6	248.1	1.1	245.8	0.2	244.5	-0.4
CHATHAM 230 kV	239.5	239.9	0.2	240.0	0.2	241.8	1.0	241.8	1.0	245.9	2.7	249.8	4.3	235.5	-1.7	232.2	-3.0
LAMBTON_P1K1 230 kV	240.4	240.6	0.1	240.6	0.1	241.3	0.3	241.2	0.3	242.4	0.8	247.3	2.9	239.2	-0.5	234.9	-2.3
LAMBTON_P2K2 230 kV	241.1	241.4	0.1	241.4	0.1	242.0	0.4	241.9	0.3	243.2	0.9	247.9	2.8	239.8	-0.6	235.5	-2.3
KEITH 230 kV	233.2	233.6	0.2	233.5	0.1	233.8	0.2	233.4	0.1	235.1	0.8	241.5	3.5	230.5	-1.2	227.1	-2.6
LAUZON C23Z 230 kV	231.7	232.4	0.3	232.3	0.3	228.1	-1.5	227.8	-1.7	-	-	-	-	228.9	-1.2	226.6	-2.2
LAUZON C24Z 230 kV	231.1	231.4	0.1	231.3	0.1	230.0	-0.5	229.6	-0.6	-	-	-	-	228.2	-1.2	225.9	-2.2
KEITH 115kV	123.9	124.1	0.2	124.1	0.2	123.6	-0.2	123.4	-0.4	123.6	-0.2	126.9	2.5	122.3	-1.3	120.8	-2.5
LAUZON 115kV	123.5	123.7	0.2	123.7	0.2	122.5	-0.7	122.4	-0.9	121.9	-1.3	125.0	1.3	122.0	-1.2	120.7	-2.3

Appendix C: Transient Stability Results

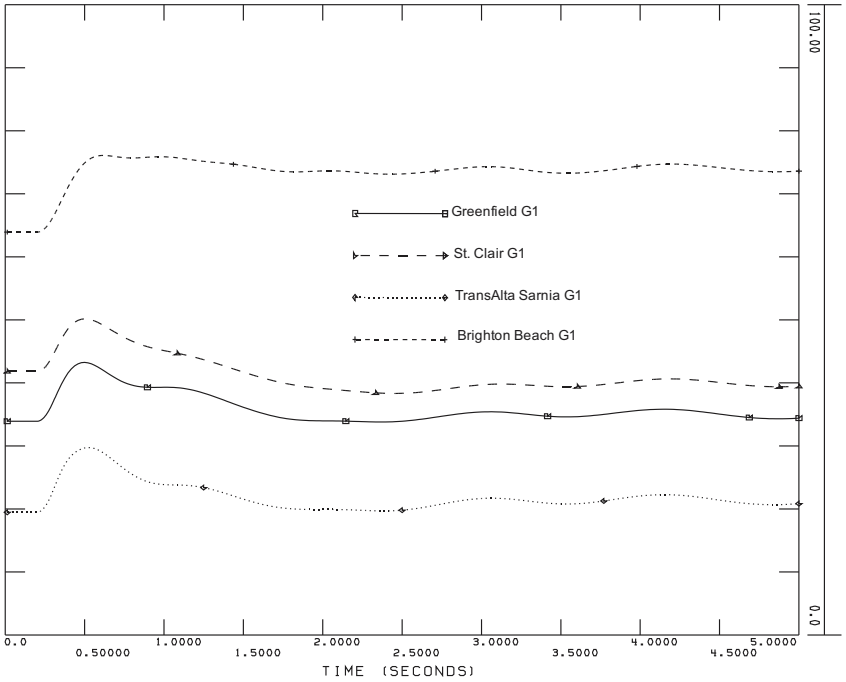


Figure 4: Generator Angle Responses Following a LLG Fault on 230 kV Circuits W44LC and W45LS near Longwood TS

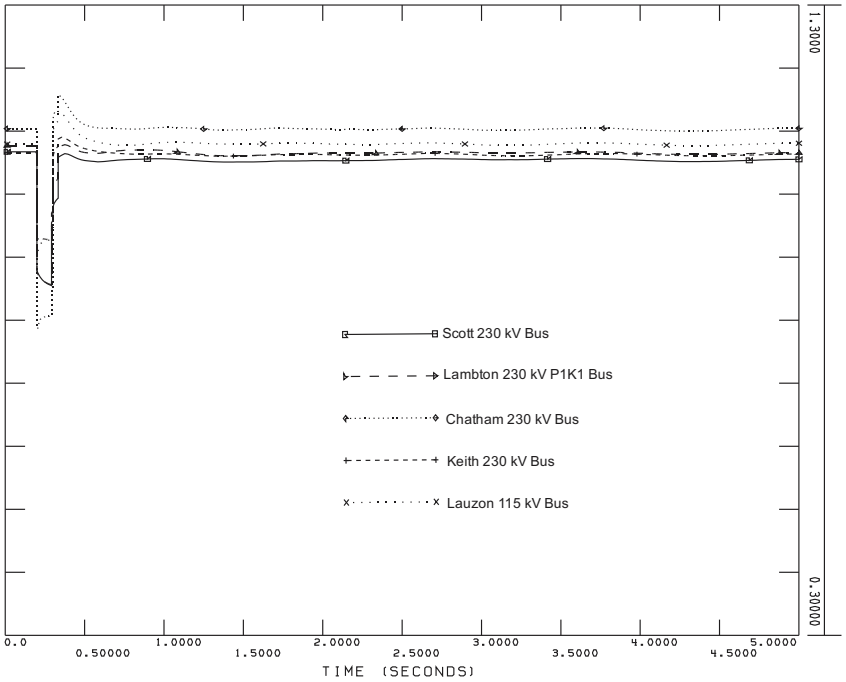


Figure 5: Voltage Responses Following a LLG Fault on 230 kV Circuits W44LC and W45LS near Longwood TS

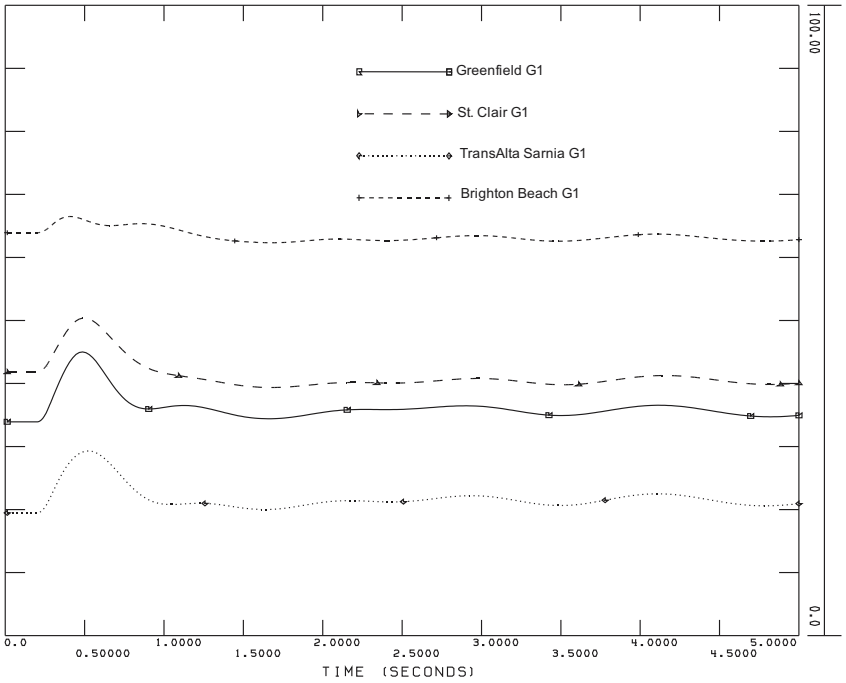


Figure 6: Generator Angle Responses Following a LLG Fault on 230 kV Circuits L24L and L26L near Lambton TS

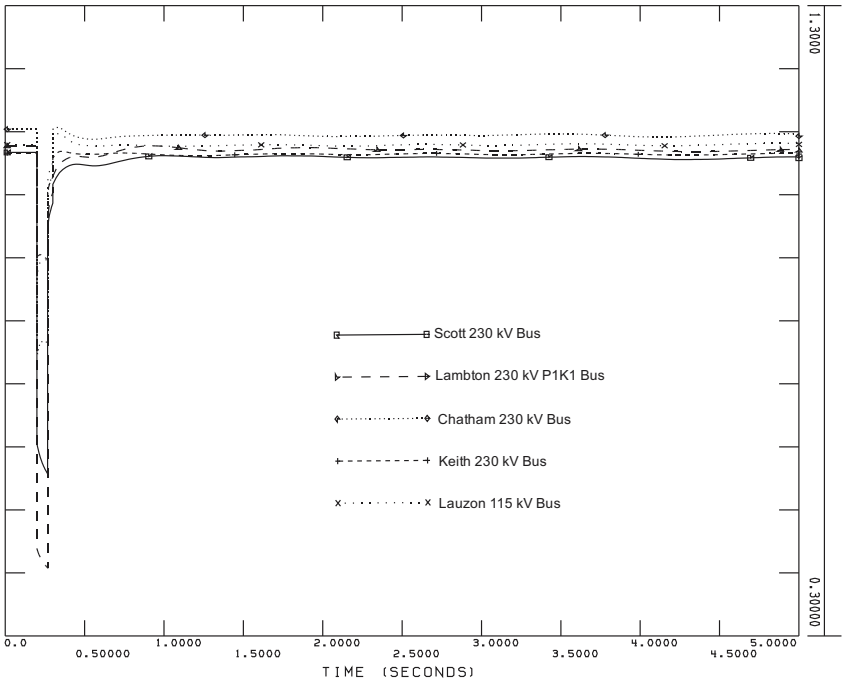


Figure 7: Voltage Responses Following a LLG Fault on 230 kV Circuits L24L and L26L near Lambton TS

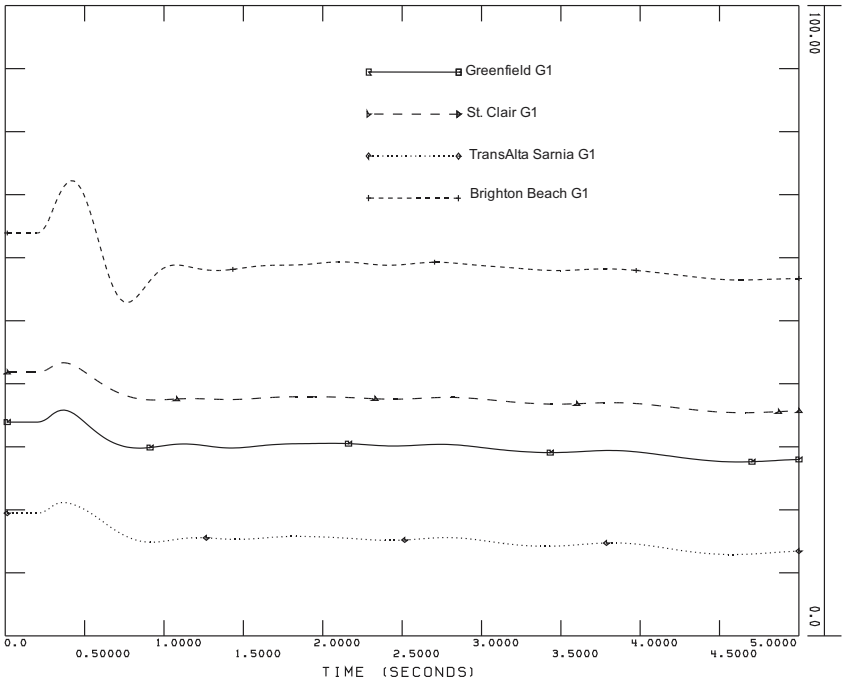


Figure 8: Generator Angle Responses Following a 3-Ph Fault on 230 kV Circuit C24Z near Chatham SS

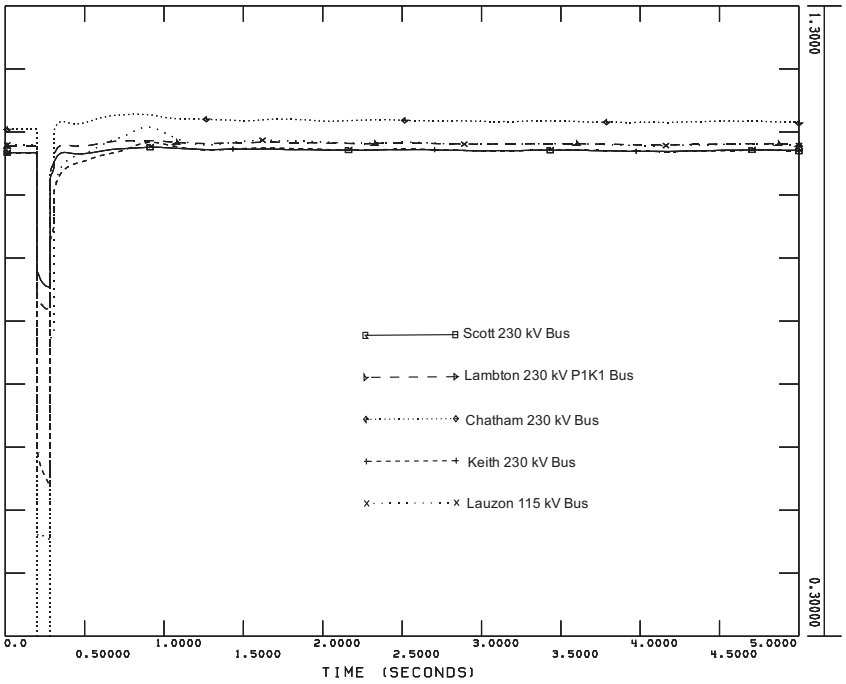


Figure 9: Voltage Responses Following a 3-Ph Fault on 230 kV Circuit C24Z near Chatham SS

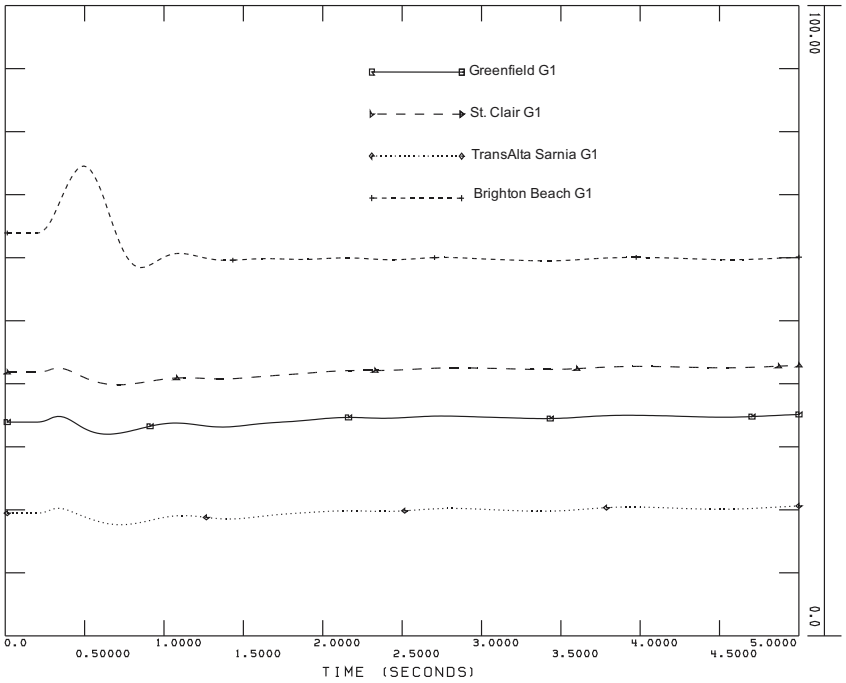


Figure 10: Generator Angle Responses Following a LLG Fault on 230 kV Circuits C21J and C22J near Chatham SS

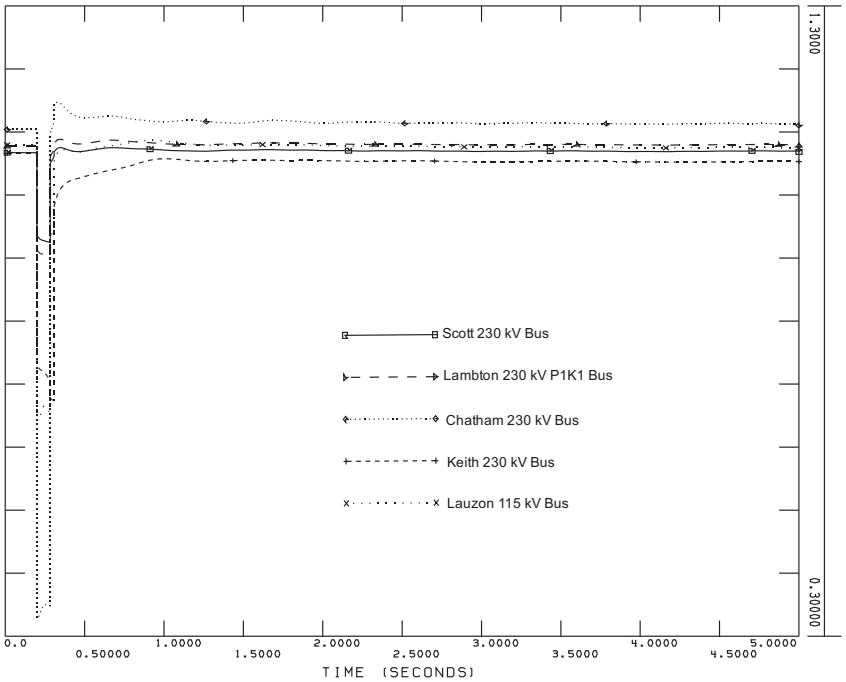


Figure 11: Voltage Responses Following a LLG Fault on 230 kV Circuits C21J and C22J near Chatham SS

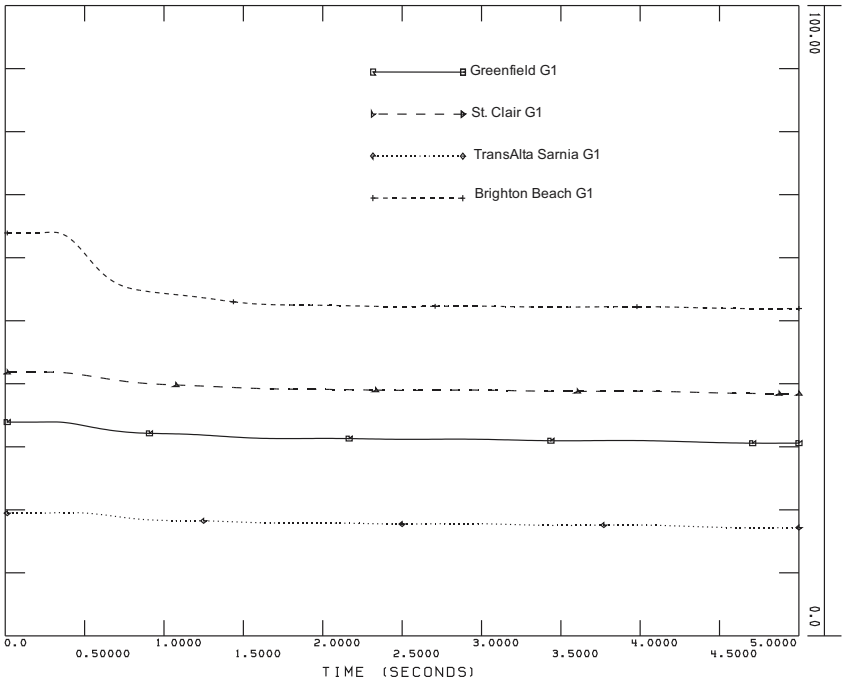


Figure 12: Generator Angle Response Following an Un-cleared 3-Ph Fault on the LV Bus at the Project

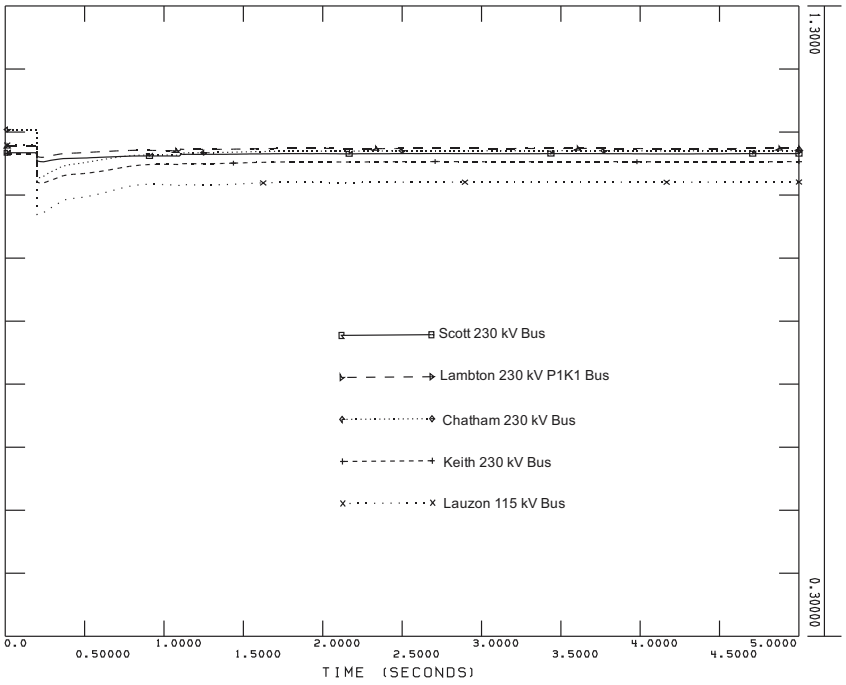


Figure 13: Voltage Response Following an Un-cleared 3-Ph Fault on the LV Bus at the Project

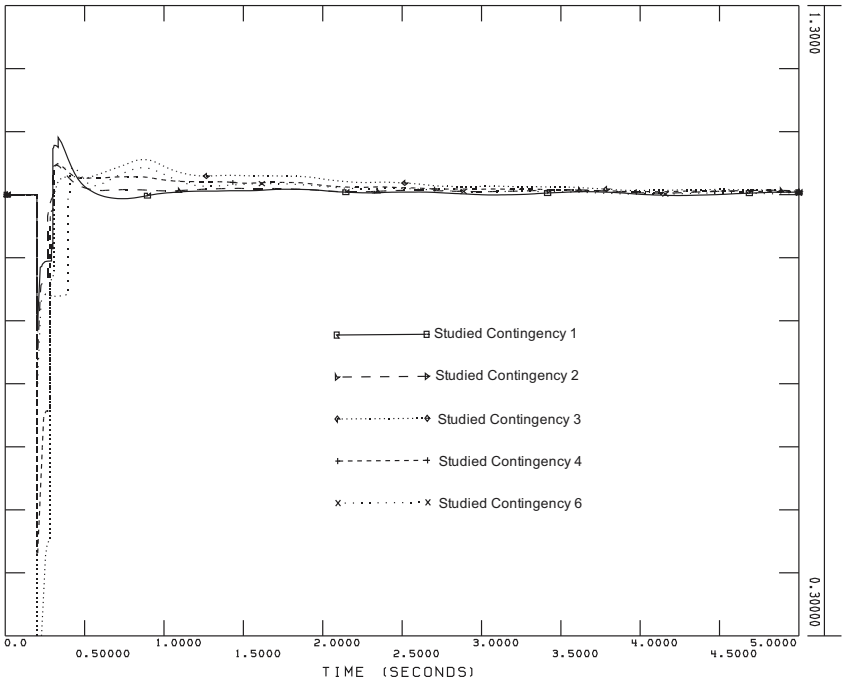


Figure 14: Terminal Voltage Response at Collector 2 Following Studied Contingencies

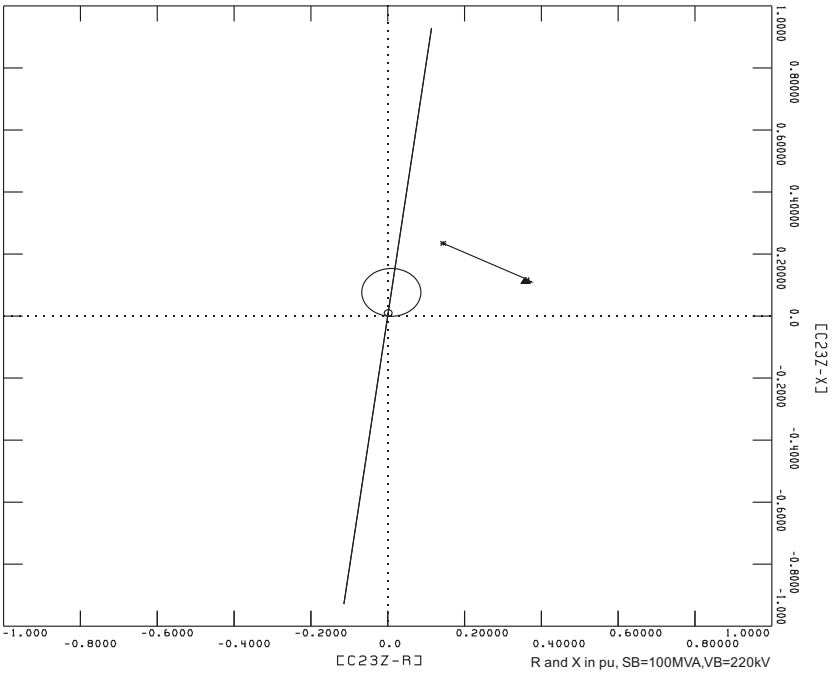


Figure 15: Impedance Trajectory of C23Z at Chatham SS Following a 3-phase Fault on 230 kV Circuit C24Z near Chatham SS

-End of Section-

Appendix D Protection Impact Assessment

Hydro One Networks Inc.
483 Bay Street
Toronto, Ontario
M5G 2P5

PROTECTION IMPACT ASSESSMENT

BELLE RIVER WIND PROJECT

Date: Aug 12, 2015
PCT Solutions Group Project #: PCT-755-PIA

Prepared by: Reviewed by:

Hydro One Networks Inc.

Disclaimer

This Protection Impact Assessment has been prepared solely for the IESO for the purpose of assisting the IESO in preparing the System Impact Assessment for the proposed connection of the proposed generation facility to the IESO–controlled grid. This report has not been prepared for any other purpose and should not be used or relied upon by any person, including the connection applicant, for any other purpose.

This Protection Impact Assessment was prepared based on information provided to the IESO and Hydro One by the connection applicant in the application to request a connection assessment at the time the assessment was carried out. It is intended to highlight significant impacts, if any, to affected transmission protections early in the project development process. The results of this Protection Impact Assessment are also subject to change to accommodate the requirements of the IESO and other regulatory or legal requirements. In addition, further issues or concerns may be identified by Hydro One during the detailed design phase that may require changes to equipment characteristics and/or configuration to ensure compliance with the Transmission System Code legal requirements, and any applicable reliability standards, or to accommodate any changes to the IESO-controlled grid that may have occurred in the meantime.

Hydro One shall not be liable to any third party, including the connection applicant, which uses the results of the Protection Impact Assessment under any circumstances, whether any of the said liability, loss or damages arises in contract, tort or otherwise.

REVISION HISTORY

Revision	Date	Change
R0	Aug 12, 2015	First Specification Document

PROTECTION IMPACT ASSESSMENT
BELLE RIVER WIND PROJECT
100MW GENERATION CONNECTION

1.0 INTRODUCTION

1.1 Protection Impact Assessment

This PIA study is prepared for the IESO to assess the potential impact of the proposed connection (100 MW) on the existing transmission protection. The primary focus of this study is on protecting Hydro One system equipment while meeting IESO System Reliability Criteria

1.2 Description of Proposed Connection to the Grid

A 100MW Belle River Wind Farm is proposed to be connected to the 230 kV circuit C23Z about 31.5 km from Lauzon TS as shown in Figure 1. The Wind Farm will be connected through an Yn/Yn/D1 transformer with 7.5% impedance on 66 MVA base.

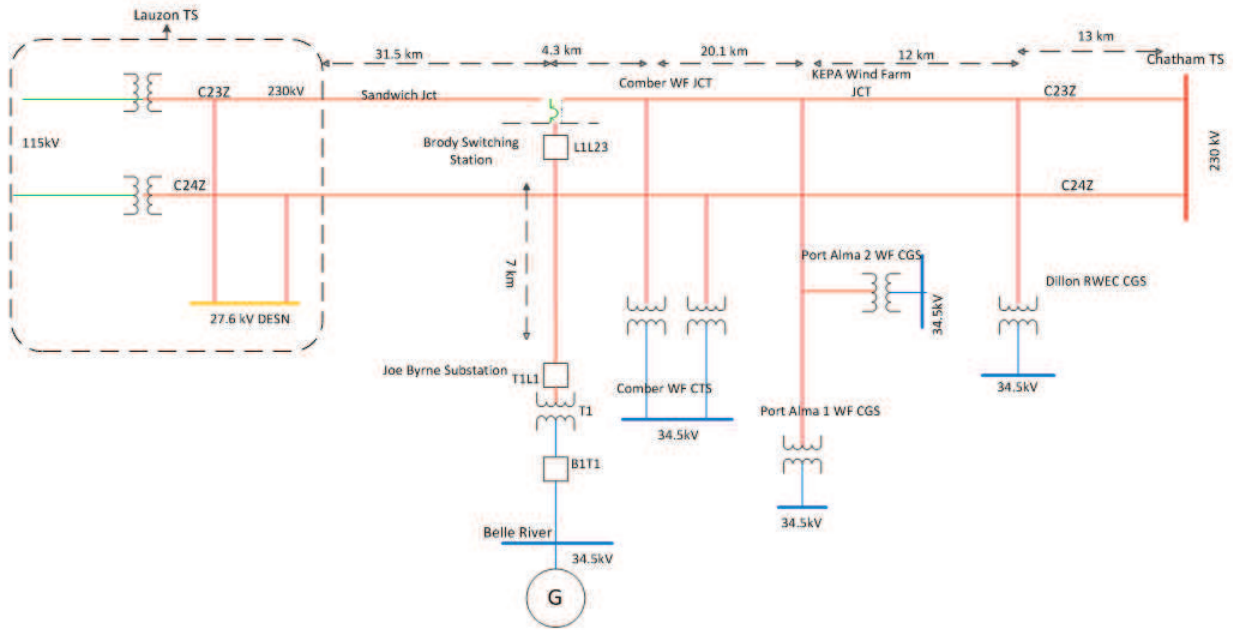


Figure 1: 100 MW Belle River Wind Farm Generation Connection to HONI Transmission System

1.3 Assumptions

The study presented in this document was based on the data provided by the proponent in the SIA application form.

2.0 PROTECTION

2.1 General

The connection of Belle River Wind Farm will require new communication links to be established to transmit protection signals required for reliable fault clearing.

2.2 Specific Protection Requirements

The existing protection scheme can accommodate the new Belle River Wind Farm. Protection work to be performed is described as follows. The existing and revised settings are presented in section 2.4.

2.2.1 Lauzon TS

The existing 'A' and 'B' C23Z line protection IEDs shall be retained. The settings may need to be modified to accommodate the Belle River Wind Farm. The protection still uses a DCB scheme.

Operation of the local line protection (zone 1, fast zone 2), local breaker failure and receipt of transfer trip from any existing terminal or tapped stations should send a transfer trip to Belle River Wind Farm to open the HV circuit breaker (L1L23). Operation of the local line protection should not be permitted to automatically reclose until the Belle River HV line breaker had successfully opened.

The current Z2 protection settings considered a configuration with Lauzon T1 out of service. With the addition of the Belle River WF, the current Z2 setting would see into the Belle River WF LV system. In the new protection scheme, based on DCB operational principle, the zone 2 setting at Lauzon TS should be set with 125% of the maximum apparent impedance for a fault at Chatham SS bus with Lauzon T1 in service. When T1 is out of service, the zone 2 element may not operate for a fault at the end of the line since the apparent impedance at Lauzon will be larger than the setting value. The zone 1 protection and the fast zone 2 protection at Chatham SS will operate instantaneously to open line breakers and send a transfer trip to Lauzon. The existing zone 1 reach will remain unaltered. The existing and revised settings are shown in Section 2.4.

HV Breaker Failure Transfer Trip, Blocking and GEO signals are required from Belle River WF to Lauzon TS.

2.2.2 Chatham SS

The existing 'A' and 'B' C23Z line protection IEDs shall be retained. The settings may need to be modified to accommodate Belle River Wind Farm. The protection still uses a DCB scheme.

Operation of the local line protection (zone 1, fast zone 2), local breaker failure and receipt of transfer trip from any existing terminal or tapped stations should send a transfer trip to Belle River Wind Farm to open the HV circuit breaker (L1L23). Operation of the local line protection should not be permitted to automatically reclose until the Belle River HV line breaker had successfully opened.

The existing zone 1 reach will remain unaltered. The existing zone 2 reach will need to be extended to cover the new maximum apparent impedance due to the connection of the Belle River Wind Farm. The existing and revised settings are shown in Section 2.4.

HV Breaker Failure Transfer Trip, Blocking and GEO signals are required from Belle River WF to Chatham SS.

2.2.3 Belle River Wind Farm

It is the customer's responsibility to provide protections to the line section between the connection point and the generation station, the station transformer and the HV circuit breakers.

Redundant line protections will be required for the line section between the connection point and the generation station that are compliant with the TSC.

Redundant transformer protections are required that are compliant with the TSC.

In addition to receiving transfer trip from Lauzon TS or Chatham SS, the customer also is required to provide 'A' and 'B' C23Z line protection to clear a fault on C23Z as backup of transfer trip from Lauzon TS or Chatham SS.

2.2.3.1 230 kV Line Protection for C23Z

'A' and 'B' line protections for the 230 kV circuit C23Z shall be installed and compliant with the TSC.

The operation of the C23Z Line protection at Belle River trips the HV circuit breaker (L1L23) only.

A blocking signal generated from operation of the reversed zone 3 shall be sent to Lauzon TS and to Chatham SS. The coordination is required between the zone 2 element at Lauzon TS/Chatham SS and Belle River reversed Zone 3.

2.2.3.2 230 kV Breaker Protection

Breaker Protection shall be installed for the new 230kV breakers and will be compliant with the TSC.

Failure of the HV breaker (L1L23) connected with C23Z will result in sending a transfer trip signal to Lauzon TS and to Chatham SS.

2.3 Tele-Protection

The proponent is responsible to establish dual telecommunication links (main and alternative) to transmit/receive protection signals between Belle River and Hydro One Lauzon TS and Chatham SS for transfer trip, blocking and GEO signals.

3.0 SCADA/RTU

4.0 POWER SYSTEM MONITORING

5.0 REVENUE METERING

6.0 CYBER SECURITY

NERC's standards CIP-002 thru CIP-009 may apply.

7.0 STATION REQUIREMENTS

8.0 UPDATE DATABASES AND DOCUMENTATION

OVERVIEW OF CUSTOMER IMPACT ASSESSMENT

The Applicant received a final Customer Impact Assessment Report ("**CIA**") from Hydro One on December 11, 2015. The CIA Report findings were:

1. *The short-circuit levels observed at customer connection points, following the connection of Belle River Wind farm, are within the requirements of the Transmission System Code (TSC). The largest increase in symmetrical short circuit current due to this facility is 5.53% (3ph) and 8.81% (L-G) at Comber Wind farm junction.*

2. *Lauzon EJ DESN is on the restricted list of stations that are not allowed any more increase in short circuit levels. Installation of Belle River generation causes further encroachment into the short circuit limit established at Lauzon EJ DESN. Belle River LP will be required to make a capital contribution to towards short circuit Mitigating Measures required at Lauzon DESN.*

3. *The connection of Belle River Wind farm results in a material increase in short circuit levels at Kingsville TS and Walker TS #1. These are stations where capital contributions were made by customers to implement mitigation measures to reduce short circuit levels to within TSC limits. As a consequence, Belle River LP will be required to make capital contributions towards the cost of the mitigation measures.*

4. *The new 7 km line tap from the wind farm to circuit C23Z will not materially increase the exposure of this circuit to faults, and the wind farm will not have any material impact on the power supply reliability of the customers in the Windsor – Essex area.*

The Applicant will make the capital contributions identified in the CIA in accordance with the Transmission System Code. No Network upgrades were identified in the CIA, so the Transmission Project will not impact Ontario's Uniform Transmission Rate.

Customer Impact Assessment

Hydro One Networks Inc.
483 Bay Street
Toronto, Ontario
M5G 2P5

CUSTOMER IMPACT ASSESSMENT

SP Belle River Wind LP – Belle River Wind GS

Revision: FINAL
Date: December 11, 2015

Issued by: Transmission Planning Department
System Planning Division
Hydro One Networks Inc.
483 Bay St
Toronto, ON M5G 2P5

Prepared by:

Qasim Raza

Approved by:

for Ibrahim El-Nahas

Disclaimer

This Customer Impact Assessment is prepared based on available information about the connection. It is intended to highlight significant impacts, if any, to affected transmission customers early in the project development process and thus allow an opportunity for these parties to bring forward any concerns that they may have including those needed for the review of the connection and for any possible application for leave to construct. Subsequent changes to the required modifications or the implementation plan may affect the impacts of the proposed connection identified in this Customer Impact Assessment. The results of this Customer Impact Assessment and the estimate of the outage requirements have taken a customer review period into account. The results are however is subject to change to accommodate the requirements of the IESO and other regulatory or municipal authority requirements.

Hydro One Networks shall not be liable to any third party which uses the results of the Customer Impact Assessment and Addendums under any circumstances whatsoever, for any indirect or consequential damages, loss of profit or revenues, business interruption losses, loss of contract or loss of goodwill, special damages, punitive or exemplary damages, whether any of the said liability, loss or damages, arises in contract, tort or otherwise.

EXECUTIVE SUMMARY

SP Belle River Wind LP proposes to build a 100 MW wind generation plants. The facility, to be known as Belle River LP will be connected to 230 kV circuit C23Z via a 230kV switching station, 7 km overhead line and a 230kV/34.5kV substation. This Customer Impact Assessment (CIA) is concerned with the potential impact of this wind farm on the area customers.

An assessment of voltage performance and loading capability of the transmission facilities in the area has been carried out and documented in an IESO System Impact Assessment (**SIA**) Report, "Belle River", CAA ID 2015-548-Belle River Wind Project dated Dec 11, 2015.

The following potential impacts on existing customers in the area are reviewed is this CIA:

- Short circuit impact
- Impact on customer power supply reliability.

The findings of this CIA are as follows:

1. The short-circuit levels observed at customer connection points, following the connection of Belle River Wind farm, are within the requirements of the Transmission System Code (TSC). The largest increase in symmetrical short circuit current due to this facility is 5.53% (3ph) and 8.81 % (L-G) at Comber Wind farm junction.

2. Lauzon EJ DESN is on the restricted list of stations that are not allowed any more increase in short circuit levels. Installation of Belle River generation causes further encroachment into the short circuit limit established at Lauzon EJ DESN. Belle River LP will be required to make a capital contribution to towards short circuit Mitigating Measures required at Lauzon DESN.

3. The connection of Belle River Wind farm results in a material increase in short circuit levels at Kingsville TS and Walker TS #1. These are stations where capital contributions were made by customers to implement mitigation measures to reduce short circuit levels to within TSC limits. As a consequence, Belle River LP will be required to make capital contributions towards the cost of the mitigation measures.

4. The new 7 km line tap from the wind farm to circuit C23Z will not materially increase the exposure of this circuit to faults, and the wind farm will not have any material impact on the power supply reliability of the customers in the Windsor – Essex area.

Customer Impact Assessment

100MW Belle River Wind Generation Plant

1.0 Introduction

1.1 Background

SP Belle River Wind LP has applied to Hydro One and IESO to connect a 100 MW Wind generating station in the town of Lakeshore in Essex County, Ontario. The proponent will connect to the Hydro One 230kV C23Z circuit between Chatham and Lauzon stations, 31.5 km from Lauzon T.S, via a 230 kV switching station (Brody Switching Station), 7.0 km 230 kV overhead transmission line, and a 230 kV/34.5 kV substation (Joe Byrne Substation). As per the connection application for the generator facility, the Customer requested back feed date for the connection is April 2017. The actual connection date (back feed date) will be determined after a connection estimate is prepared and will be contractually agreed to at the time of executing the Connection Cost Recovery Agreement.

In accordance with section 6 of the Ontario Energy Board's Transmission System Code, Hydro One Networks Inc. (Hydro One) has carried out this Customer Impact Assessment (CIA) study to assess the impact of the proposed generator connection on existing customers in the affected area. The primary focus of the study is to identify the fault levels on the facilities of transmission connected customers following the incorporation of the Belle River project. This study does not evaluate the overall impact of the Belle River on the bulk electricity system. The impact of the new generator on the bulk electricity system is the subject of the System Impact Assessment (SIA) carried out by the Independent Electricity System Operator (IESO).

As part of the Connection Assessment and Approval (**CAA**) process, the IESO has carried out a System Impact Assessment (**SIA**) for the Belle River Wind Farm and documented in CAA ID 2015-548-Belle River-First Draft, "Belle River", dated Oct 20, 2015.

1.2 Proposed Connection

The Belle River wind project consists of forty one Siemens Wind Turbine Generators (WTGs). The WTGs will be connected to four underground 34.5 kV collector circuits, which will be connected to the main 34.5 kV collector bus via circuit breakers. The 34.5 kV bus is connected to a 66/88/110 MVA, 240/34.5 kV transformer. The transformer then connects to Hydro One 230 kV circuit C23Z at tower # 252 via a circuit breaker, 7 km overhead transmission line, another circuit breaker and a disconnect switch as depicted in Figure 1

1.3 Customer List

The following are customers in the studied area for this report.

Station	Customer	Circuit
Comber WF CTS	Comber Wind limited Partnership	C23Z/C24Z
Port Alma WF CGS	Kruger Energy Port Alma limited Partnership	C23Z
Dillon RWEC CGS	Raleigh Wind Power Partnership	C23Z
Lauzon TS	Hydro One Distribution EnWin Utilities Ltd.	C24Z/C23Z
Sattern and Railbed CGS	South Kent Wind LP	C31
Chrysler WAP MTS	EnWin Utilities Ltd.	E8F/E9F
GM Windsor MTS	EnWin Utilities Ltd.	E8F/E9F
Ford Annex MTS	EnWin Utilities Ltd.	E8F/E9F
Ford Windsor MTS	EnWin Utilities Ltd.	E8F/E9F
Essex TS	Hydro One Distribution	E8F/E9F
East Windsor CGS	EnWin Utilities Ltd.	E8F/E9F
Ford Essex CTS	EnWin Utilities Ltd.	Z7E/Z1E
Walker TS	EnWin Utilities Ltd.	Z7E/Z1E
Walker MTS	EnWin Utilities Ltd	Z7E/Z1E
Windsor Transalta CGS	TransAlta (SC) L.P.	Z7E/Z1E
Crawford TS	EnWin Utilities Ltd.	J4E/J3E
Malden TS	EnWin Utilities Ltd. Hydro One Distribution Essex Power Corps	C21J/C22J
Brighton Beach CGS	Brighton Beach Power L.P	J20B/J1B
Gosfield Wind CGS	Gosfield Wind Limited Partnership	K2Z
Pte-Aux-RochesWF CGS	Pointe-Aux-Roches Wind Inc.	K6Z
Kingsville TS	Hydro One Distribution	K2Z/K6Z
Belle River TS	Hydro One Distribution	K2Z/K6Z
Tilbury West DS/TS	Hydro One Distribution	K2Z
Keith TS	Hydro One Distribution EnWin Utilities Ltd. Essex Power lines Corp	Keith TS 230 kV bus

2.0 Customer Impact Assessment Scope

The purpose of this CIA is to assess the potential impacts of the Belle River Wind Project on the existing transmission-connected load and generation customers in the area. This is in accordance with the requirements of the Ontario Energy Board Transmission System code.

3.0 Methodology and Criteria

3.1 Study Assumptions

Short circuit studies assumed the following:

- Line Data – All existing transmission facilities, and planned transmission upgrades including the Guelph Area Transmission Reinforcement are assumed to be in-service.
- Transformer/Phase Shifter Data – All existing transformers and phase shifters are assumed to be in-service
- Generation Data – All existing generating stations and all committed generation projects assumed to be in-service.

3.2 Planning criteria

The Transmission System Code requires that symmetrical short circuit levels at transmission customer connection points not exceed maximum allowable levels as set out in the code. These are summarized below:

Nominal Voltage (kV)	***Max. 3-Phase Fault (kA)***	***Max. SLG Fault (kA)***
230	63	80 (usually limited to 63kA)
115	50	50
44	20(1)	19 (usually limited to 8 kA)
27.6 (4-wire)	17	12
27.6 (3-wire)	17	0.45
13.8	21	10

Notes:
Maximum fault values referred in this table are symmetrical fault values
(1) – Effective September 1, 2010, Hydro One requires a 5 % margin on the acceptable TSC limits at voltage levels of <50kV to account for other sources of fault current on the distribution system such as unmodelled synchronous motors and data inaccuracies.

4.0 Short Circuit Study Analysis

4.1 Short Circuit Assessment

Short circuit studies were carried out to assess the fault level (with and without Belle River) for the Windsor-Essex area. Four different scenarios were considered as follows:

- Belle River o/s, bus-tie reactors at Kingsville/Keith/Walker i/s
- Belle River i/s, bus-tie reactors at Kingsville/Keith/Walker i/s
- Belle River i/s, bus-tie reactors at Kingsville/Keith/Walker o/s
- Belle River o/s, bus-tie reactors at Kingsville/Keith/Walker o/s

The results are tabularized at the end of the report.

4.1.1 Belle River o/s, bus-tie reactors at Kingsville/Keith/Walker i/s

Before the incorporation of Belle River, the short circuit levels are shown in Table 1 with bus tie reactors in service. Comparing Table 1 with the short circuit maximum levels of the Transmission System Code, all equipment are within the limits of the code.

4.1.2 Belle River i/s, bus-tie reactors at Kingsville/Keith/Walker i/s

The results of the short circuit results following incorporation of Belle River project are shown in Table 2 along with the relative increase due to the project. Addition of Belle River project caused a small increase in fault levels. The largest symmetrical short circuit increase is 5.53 % (3ph) and 8.81 % (L-G) at Comber Wind farm Junction off of C23Z, which is the closest in proximity to Belle River project.

Addition of Belle River also increases the 3-phase short circuit fault on Lauzon EJ DESN by 54 Amps. Lauzon EJ DESN is already on the restricted list of stations that are not allowed any more increase in short circuit levels. Hence installation of Belle River generation causes further encroachment into the short circuit limit established at Lauzon EJ DESN. Due to this, mitigation measures will be required at Lauzon EJ DESN to reduce short circuit levels. More details will be provided in the CCRA.

4.2 Impact of Belle River Project on Kingsville/Keith/Walker

Hydro One installed bus-tie reactors to reduce fault current ("Mitigation Measures") at Walker TS #1 (in-service, June 15, 2011), Kingsville TS (in-service, November 5, 2011), and Keith TS (in-service, April 27, 2012). The reactor installation projects at Walker TS #1 and Kingsville TS were funded by generation proponents.

Belle River impacts all the three stations. The results of the short circuit results with and without Belle River with bus tie reactors out of service are shown in Table 3 and Table 4 respectively. Only stations with short circuit violations are shown in the tables. These tables illustrate the increase in amps at Walker TS #1, Kingsville TS and Keith TS with the addition of Belle River and will be used to calculate the customer's capital contribution for the 'Mitigation Measures' that Hydro One undertook at these stations by installing reactors.

As per the requirements of the TSC, for projects funded by customers before August 26, 2013, future customers who benefit from the Mitigation Measures within five years of the in-service date of the Mitigation Measures are required to pay a share of the cost of the Mitigation Measures proportional to their respective rated capacities.

Generation proponents will therefore be required to participate in costs of the Mitigation Measures at Walker TS#1 and Kingsville TS,. Generation proponents are not required to pay a capital contribution for the installation of the Mitigation Measure at Keith TS as this project was not funded by capital contributions from customers.

As shown in Table 4, connection of Belle River project increases the short circuit levels at Kingsville TS and Walker TS by 16 Amps and 20 Amps respectively. These values exceed the 10 Amps materiality limit applicable for this assessment.

In consideration of the material increase in the short circuit levels at Kingsville TS and Walker TS #1, Belle River will be required to make a capital contribution, which is to be used to refund customers that

previously made capital contributions for the Mitigation Measures at the two stations. The capital contribution amounts are to be determined during the CCRA process.

5.0 Supply reliability to customers

The Belle River GS is connected to the Hydro One C23Z through a main and auxiliary switchyard. The auxiliary switchyard has a high voltage circuit breaker and motorized disconnect switches to provide isolation to the entire Belle River facility. The breaker can be used under fault or maintenance conditions to isolate the plant from the transmission system grid without affecting other Hydro One Customers. The main switchyard, which will be 7 km from the auxiliary switchyard, will consist of a 230kV outdoor switchyard and a 34.5kV indoor facility.

The connection of Belle River Wind project will add about 7 km of overhead line to the existing C23Z circuit. This will not significantly increase the exposure of the 81 km long C23Z circuit to faults. Hence the connection of this project is not expected to materially affect the reliability of supply to customers in the Windsor-Essex area.

The IESO SIA report concluded that the Belle River project does not have a material adverse impact on the reliability of the integrated power system.

6.0 Conclusions and Recommendations

This CIA report presents results of incorporating the Belle River project which is planned to connect into 230 kV circuit C23Z. In particular, the results of short circuit analyses and a qualitative assessment of the impact on supply reliability to area customers have been presented.

The new line tap from the wind farm to circuit C23Z will not materially increase the exposure of the circuit to faults, and is not expected to materially impact the supply reliability of area customers.

The short circuit levels observed at connecting points, following incorporation of the Belle River project, are within the requirements of the Transmission System Code.

Belle River LP will be required to make a capital contribution to towards short circuit Mitigating Measures required at Lauzon DESN due to connection of Belle River wind farm.

Belle River LP will be required to make a capital contribution for the previously completed Mitigation Measures at Kingsville TS and Walker TS #1. This contribution will be used to refund customers that previously made capital contributions for the work.

It is recommended that area customers review the impact of the short-circuit change on their facilities and take appropriate and timely action to address any safety/technical issues arising out of the changes which will result following incorporation of the project in September 2017.

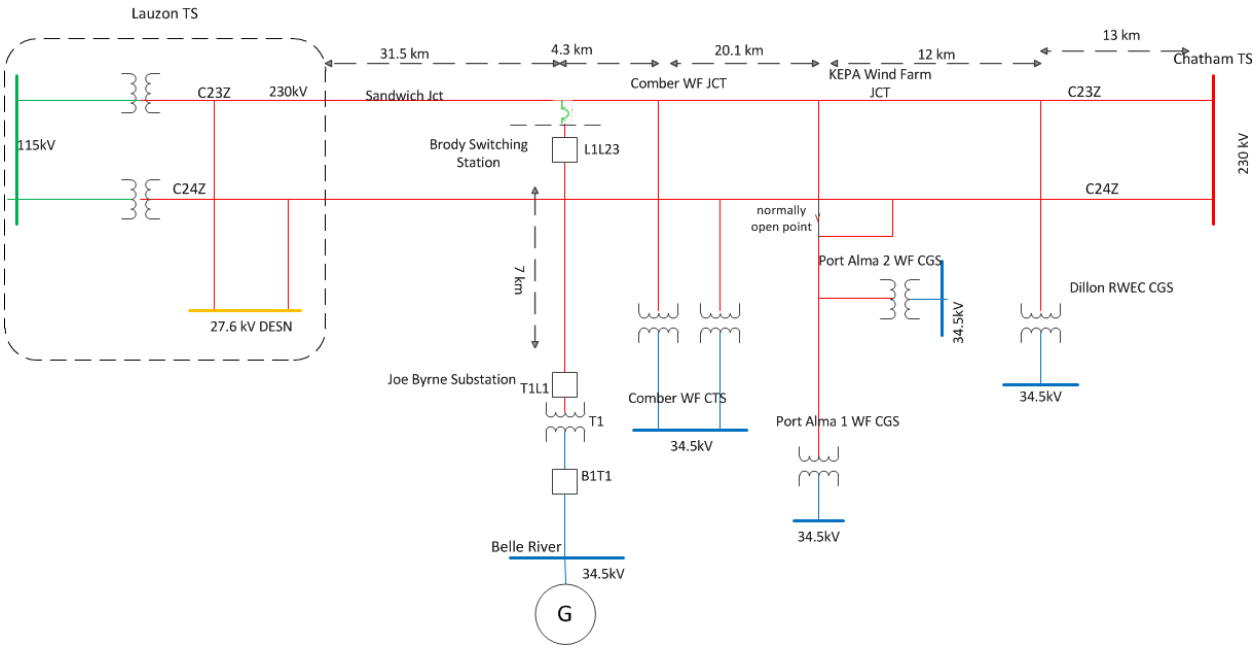


Figure 1: Schematic Diagram with the inclusion of Belle River facility

Table 1: Fault Levels (kA) before Incorporation of Belle River

	3-phase		L-G	
Station	Symmetrical	Asymmetrical	Symmetrical	Asymmetrical
Chatham TS 230 kV	25.253	30.814	21.854	26.429
Keith TS 230 kV	19.385	27.53	21.144	30.199
Dillon WF JCT 230 kV	13.766	16.478	11.995	13.729
Dillon WF JCT 230 kV	13.719	16.42	11.946	13.673
KEPA WF JCT (C23Z) 230 kV	10.282	12.21	9.218	10.383
KEPA WF JCT (C24Z) 230 kV	10.728	12.786	10.773	12.501
Port Alma 2 WF 230 kV	9.018	10.842	9.515	11.82
Port Alma WF 230 kV	8.311	9.212	8.684	10.004
Comber WF JCT (C23Z) 230 kV	8.179	9.973	8.622	11.174
Comber WF JCT (C24Z) 230 kV	8.323	9.954	8.916	11.374
Comber WF (C23Z) 230 kV	8.151	9.935	8.603	11.167
Comber WF (C24Z) 230 kV	8.293	9.917	8.893	11.374
C31 JCT#1 (C31) 230 kV	16.673	19.688	14.504	17.118
Railbed CGS 230 kV	8.016	9.371	7.155	9.074
Sattern CGS 230 kV	12.835	15	11.118	13.844
Brighton Interface (J20B) 230 kV	19.224	27.336	20.978	30.052
Brighton Interface (J1B) 115 kV	23.916	31.698	27.849	37.565
West Windsor Power 115 kV	22.319	28.376	24.999	32.366
East Windsor CGS (E8F) 115 kV	19.651	21.719	19.157	20.918
East Windsor CGS (E9F) 115 kV	19.713	21.81	19.238	21.026
Gosfield CGS 115 kV	5.121	5.559	4.689	5.41
Gosfield CGS JCT 115 kV	5.125	5.563	4.69	5.409
Pte-Aux-RochesWF JCT 115 kV	7.769	8.671	4.55	4.728
Pte-Aux-RochesWF 115 kV	7.761	8.663	4.544	4.723
Windsor Transalta CGS 115 kV	22.434	25.555	23.197	26.594
Windsor Transalta JCT 115 kV	23.166	26.983	24.352	28.614
Keith TS 115 kV	24.148	28.16	28.335	35.229
Lauzon TS 115 kV	21.585	24.582	24.193	28.7
Essex TS 115 kV	23.371	27.267	24.656	29.122
Ford Essex (Z1E) 115 kV	19.257	21.473	19.353	21.06
Ford Essex (Z7E) 115 kV	19.211	21.389	19.324	21.008
Walker TS (Z1E) 115 kV	22.114	25.418	22.546	25.604
Walker TS (Z7E) 115 kV	22.026	25.263	22.455	25.39
Ford Windsor (E8F) 115 kV	19.786	21.896	19.335	21.14
Ford Windsor (E9F) 115 kV	19.787	21.908	19.337	21.15
GM Windsor (E8F) 115 kV	21.532	24.272	21.707	23.711
GM Windsor (E9F) 115 kV	21.532	24.279	21.708	23.715

	3-phase		L-G	
Station	Symmetrical	Asymmetrical	Symmetrical	Asymmetrical
Chrysler MTS (E8F) 115 kV	22.973	26.538	24.039	27.858
Chrysler MTS (E9F) 115 kV	22.973	26.54	24.04	27.86
Annex (E8F) 115 kV	20.774	23.214	20.617	22.376
Annex (E9F) 115 kV	20.775	23.223	20.619	22.382
Keith TS Y bus 27.6 kV	12.417	13.731	9.276	11.211
Keith TS B bus 27.6 kV	12.836	17.441	9.424	13.36
Keith Transformer 27.6 kV	6.91	7.188	0	0
Lauzon TS BQ 27.6 kV	14.212	18.325	10.908	15.086
Lauzon TS EJ 27.6 kV	15.174	19.503	11.44	15.737
Malden B bus 27.6 kV	15.003	19.386	11.518	15.834
Malden Y bus 27.6 kV	14.078	18.423	10.562	14.742
Crawford TS (EY) 27.6 kV	15.022	19.387	11.213	14.996
Essex TS (JQ) 27.6 kV	15.708	20.647	11.012	15.384
Walker (E bus) 27.6 kV	14.165	18.416	9.791	13.606
Walker (Q bus) 27.6 kV	11.97	15.694	9.028	12.591
Walker (BY) 27.6 kV	14.822	19.439	9.369	13.188
Tilbury Transformer 27.6 kV	1.664	2.011	0	0
Tilbury West DS B2bus 27.6 kV	2.946	3.276	3.173	3.688
Tilbury West DS B1bus 27.6 kV	2.634	2.924	2.914	3.378
Belle River TS 27.6 kV	11.291	13.505	7.905	10.425
Kingsville TS Y bus 27.6 kV	13.161	14.418	10.442	12.352
Kingsville TS B bus 27.6 kV	12.491	13.778	9.804	11.728
Wallaceburg 27.6 kV	6.788	6.981	6.962	7.448
Windsor Solar 115 kV	20.842	23.599	22.23	25.087
Windsor Solar 115 kV	20.842	23.599	22.23	25.087
Ford Essex CTS 13.8 kV	18.119	19.014	8.886	10.602
Ford Windsor MTS 27.6 kV	13.682	17.97	8.392	11.299
GM Windsor MTS 27.6 kV	12.29	15.738	8.044	10.716
Chrysler MTS 27.6 kV	11.371	15.105	7.785	10.544
Ford Annex MTS 13.8 kV	18.654	20.038	0.802	0.802

Table 2: Fault Levels (kA) with Incorporation of Belle River

	3-phase		L-G		%Symmetrical Increase with Belle River I/S	
Station	Symmetrical	Asymmetrical	Symmetrical	Asymmetrical	3ph	L-G
Chatham TS 230 kV	25.5	31.083	22	26.58	0.98	0.67
Keith TS 230 kV	19.424	27.578	21.179	30.242	0.20	0.17
Dillon WF JCT 230 kV	14.025	16.772	12.2	13.937	1.88	1.71
Dillon WF JCT 230 kV	13.976	16.712	12.149	13.879	1.87	1.70
KEPA WF JCT (C23Z) 230 kV	10.585	12.566	9.518	10.687	2.95	3.25
KEPA WF JCT (C24Z) 230 kV	10.779	12.838	10.813	12.54	0.48	0.37
Port Alma 2 WF 230 kV	9.052	10.877	9.543	11.848	0.38	0.29
Port Alma WF 230 kV	8.341	9.24	8.707	10.026	0.36	0.26
Comber WF JCT (C23Z) 230 kV	8.631	10.563	9.382	12.127	5.53	8.81
Comber WF JCT (C24Z) 230 kV	8.36	9.994	8.961	11.421	0.44	0.50
Comber WF (C23Z) 230 kV	8.6	10.519	9.353	12.108	5.51	8.72
Comber WF (C24Z) 230 kV	8.33	9.956	8.937	11.42	0.45	0.49
C31 JCT#1 (C31) 230 kV	16.776	19.795	14.562	17.176	0.62	0.40
Railbed CGS 230 kV	8.038	9.393	7.167	9.086	0.27	0.17
Sattern CGS 230 kV	12.894	15.06	11.151	13.877	0.46	0.30
Brighton Interface (J20B) 230 kV	19.262	27.384	21.011	30.094	0.20	0.16
Brighton Interface (J1B) 115 kV	24.002	31.794	27.927	37.654	0.36	0.28
West Windsor Power 115 kV	22.392	28.449	25.061	32.43	0.33	0.25
East Windsor CGS (E8F) 115 kV	19.764	21.834	19.232	20.993	0.58	0.39
East Windsor CGS (E9F) 115 kV	19.826	21.925	19.314	21.102	0.57	0.40
Gosfield CGS 115 kV	5.13	5.567	4.694	5.415	0.18	0.11
Gosfield CGS JCT 115 kV	5.133	5.571	4.695	5.414	0.16	0.11
Pte-Aux-RochesWF JCT 115 kV	7.79	8.693	4.556	4.735	0.27	0.13
Pte-Aux-RochesWF 115 kV	7.782	8.684	4.551	4.73	0.27	0.15
Windsor Transalta CGS 115 kV	22.587	25.717	23.313	26.715	0.68	0.50
Windsor Transalta JCT 115 kV	23.33	27.163	24.481	28.754	0.71	0.53
Keith TS 115 kV	24.236	28.247	28.417	35.312	0.36	0.29
Lauzon TS 115 kV	21.801	24.838	24.42	28.973	1.00	0.94
Essex TS 115 kV	23.536	27.45	24.787	29.264	0.71	0.53
Ford Essex (Z1E) 115 kV	19.41	21.641	19.477	21.187	0.79	0.64
Ford Essex (Z7E) 115 kV	19.363	21.556	19.447	21.135	0.79	0.64
Walker TS (Z1E) 115 kV	22.267	25.584	22.661	25.723	0.69	0.51
Walker TS (Z7E) 115 kV	22.179	25.428	22.569	25.509	0.69	0.51
Ford Windsor (E8F) 115 kV	19.901	22.012	19.411	21.216	0.58	0.39
Ford Windsor (E9F) 115 kV	19.902	22.024	19.414	21.226	0.58	0.40

	3-phase		L-G		%Symmetrical Increase with Belle River I/S	
Station	Symmetrical	Asymmetrical	Symmetrical	Station	Symmetrical	Asymmetrical
GM Windsor (E8F) 115 kV	21.67	24.416	21.806	23.81	0.64	0.46
GM Windsor (E9F) 115 kV	21.671	24.423	21.807	23.814	0.65	0.46
Chrysler MTS (E8F) 115 kV	23.132	26.711	24.163	27.989	0.69	0.52
Chrysler MTS (E9F) 115 kV	23.132	26.712	24.163	27.99	0.69	0.51
Annex (E8F) 115 kV	20.902	23.346	20.705	22.463	0.62	0.43
Annex (E9F) 115 kV	20.903	23.355	20.707	22.469	0.62	0.43
Keith TS Y bus 27.6 kV	12.419	13.733	9.276	11.212	0.02	0.00
Keith TS B bus 27.6 kV	12.839	17.444	9.425	13.361	0.02	0.01
Keith Transformer 27.6 kV	6.912	7.189	0	0	0.03	-
Lauzon TS BQ 27.6 kV	14.266	18.4	10.929	15.12	0.38	0.19
Lauzon TS EJ 27.6 kV	15.227	19.577	11.46	15.769	0.36	0.18
Malden B bus 27.6 kV	15.006	19.39	11.519	15.835	0.02	0.01
Malden Y bus 27.6 kV	14.081	18.426	10.563	14.743	0.02	0.01
Crawford TS (EY) 27.6 kV	15.034	19.402	11.217	15.002	0.08	0.04
Essex TS (JQ) 27.6 kV	15.728	20.673	11.019	15.393	0.13	0.06
Walker (E bus) 27.6 kV	14.177	18.433	9.795	13.612	0.08	0.04
Walker (Q bus) 27.6 kV	11.981	15.709	9.032	12.597	0.09	0.04
Walker (BY) 27.6 kV	14.84	19.463	9.374	13.195	0.12	0.05
Tilbury Transformer 27.6 kV	1.664	2.012	0	0	0.00	-
Tilbury West DS B2bus 27.6 kV	2.947	3.277	3.174	3.689	0.03	0.03
Tilbury West DS B1bus 27.6 kV	2.635	2.925	2.915	3.378	0.04	0.03
Belle River TS 27.6 kV	11.304	13.521	7.909	10.431	0.12	0.05
Kingsville TS Y bus 27.6 kV	13.171	14.427	10.446	12.356	0.08	0.04
Kingsville TS B bus 27.6 kV	12.5	13.787	9.807	11.731	0.07	0.03
Wallaceburg 27.6 kV	6.788	6.981	6.962	7.448	0.00	0.00
Windsor Solar 115 kV	21.032	23.817	22.407	25.279	0.91	0.80
Windsor Solar 115 kV	21.032	23.817	22.407	25.279	0.91	0.80
Belle River CGS (Tap) 230 kV	8.424	10.304	8.999	11.087	-	-
Belle River CGS 230 kV	7.455	8.812	7.641	8.924	-	-
Ford Essex CTS 13.8 kV	18.136	19.035	8.889	10.607	0.09	0.03
Ford Windsor MTS 27.6 kV	13.69	17.981	8.394	11.302	0.06	0.02
GM Windsor MTS 27.6 kV	12.302	15.752	8.047	10.72	0.10	0.04
Chrysler MTS 27.6 kV	11.381	15.119	7.788	10.548	0.09	0.04
Ford Annex MTS 13.8 kV	18.667	20.052	0.802	0.802	0.07	0.00

Table 3: Fault Levels with bus tie reactors o/s, Before Belle River Incorporation

	3-phase		L-G	
Station	Symmetrical	Asymmetrical	Symmetrical	Asymmetrical
Walker (E bus) 27.6 kV	17.301	22.421	11.711	16.336
Walker (Q bus) 27.6 kV	17.301	22.421	11.711	16.336
Kingsville TS Y bus 27.6 kV	16.979	18.292	12.806	14.928
Kingsville TS B bus 27.6 kV	16.979	18.292	12.806	14.928
Keith TS Y bus 27.6 kV	16.659	18.499	11.63	14.174
Keith TS B bus 27.6 kV	16.659	22.649	11.63	16.558

Table 4: Fault Levels with bus tie reactors o/s, After Belle River Incorporation

	3-phase		L-G		Symmetrical Increase with Belle I/S (Amps)	
Station	Symmetrical	Asymmetrical	Symmetrical	Asymmetrical	3ph	L-G
Walker (E bus) 27.6 kV	17.321	22.449	11.717	16.345	20	6
Walker (Q bus) 27.6 kV	17.321	22.449	11.717	16.345	20	6
Kingsville TS Y bus 27.6 kV	16.995	18.308	12.813	14.934	16	7
Kingsville TS B bus 27.6 kV	16.995	18.308	12.813	14.934	16	7
Keith TS Y bus	16.663	18.502	11.632	14.175	4	2
Keith TS B bus	16.663	22.654	11.632	16.56	4	2