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October 16, 2013

Delivered by Courier and RESS

Ms. Kirsten Walli
Board Secretary
Ontario Energy Board
2300 Yonge Street
26th Floor, Box 2319
Toronto, ON M4P 1E4

Dear Ms. Walli

Re: Application for Amendment to Form of Transmission Connection Agreement – McLean’s Mountain Wind Limited Partnership

We are counsel to McLean’s Mountain Wind Limited Partnership (the “Applicant”). On April 12, 2010 the Applicant received two contracts from the Ontario Power Authority (“OPA”) for the purchase of electricity generated by wind turbines through the Ontario Feed-in-Tariff (“FIT”) program (enabled by the *Green Energy and Green Economy Act, 2009*) with contract capacities of 50 MW and 10 MW. The FIT contracts are for the McLean’s Mountain Wind Farm project (“MMWF Project”), a wind farm located south of the community of Little Current, in the Municipality of Northeastern Manitoulin and the Islands (“NEMI”), geographic Township of Howland, and the geographic Township of Bidwell in the District of Manitoulin, Ontario.

By its Decision and Order dated June 28, 2013, the Board granted the Applicant leave to construct transmission facilities (the “Transmission Facilities”) for the connection of the MMWF Project to the Ontario electricity grid (Board File No. EB-2011-0394). The Transmission Facilities will connect the MMWF Project to the IESO-controlled grid on Goat Island. The licensed transmitter to whose system the Applicant will be connecting is Hydro One Networks Inc. (“Hydro One”). Construction of the Transmission Facilities is currently underway.

The Board’s Transmission System Code (the “TSC”) requires the Applicant to enter into a connection agreement with Hydro One in the form set out in Appendix 1 of the TSC (in the case of a generator customer, the form of Connection Agreement is Appendix 1, Version B). Section 4.1.2 of the TSC provides (in part) that a transmitter may not amend the terms and conditions of a connection agreement except as expressly contemplated in the applicable version of the connection agreement set out in Appendix 1 or with the prior approval of the Board.

The Applicant requires a small amendment to the form of Connection Agreement as it relates to designation of the point of interconnection between the Applicant’s Transmission Facilities and those of Hydro One, and the Applicant is advised that Hydro One is agreeable to the amendment. Accordingly, please find accompanying this letter two paper copies of an Application for leave to amend the Connection Agreement.

As will be seen in the Application, the Applicant respectfully requests that the Board issue a Decision in this matter at its earliest opportunity without the necessity of conducting a hearing, as provided by subsection 21(4) of the *Ontario Energy Board Act, 1998*, S.O. 1998, (the “OEB Act”) as no other party will be adversely affected in a material way by the outcome of this proceeding. The Applicant also notes that section 3.0.13 of the TSC provides, consistent with subsection 70.1(3) of the OEB Act, that any matter under the TSC that requires a determination by the Board may be determined without a hearing or through an oral, written or electronic hearing, at the Board’s discretion.

We ask that all correspondence and other documents in this proceeding be directed to:

Mr. Gordon Potts
McLean’s Mountain Wind Limited Partnership
30 St. Clair Ave. West, Suite 1700
Toronto, ON M4V 3A1

Telephone: 647.288.1223
Facsimile: 416.926.6266
E-mail: gpotts@northlandpower.ca

Mr. Art Jacko
Mnidoon Mnising Power Limited Partnership
c/o United Chiefs & Councils of Mnidoon Mnising
P.O. Box 275
M’Chigeeng, ON P0P 1G0

Telephone: 705.377.5307
Facsimile: 705.377.5309
E-mail: ajacko@uccm.ca

Mr. James C. Sidlofsky
Borden Ladner Gervais LLP
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Scotia Plaza
Toronto, ON M5H 3Y4

Telephone: 416.367.6277
Facsimile: 416.361.2751
E-mail: jsidlofsky@blg.com

Please do not hesitate to contact me should you have any questions or require further information.

Yours very truly,

BORDEN LADNER GERVAIS LLP
Per:

Original signed by James C. Sidlofsky
James C. Sidlofsky

Encls.
copy to: Gordon Potts, McLean's Mountain Wind Limited Partnership
 Art Jacko, Mnidoo Mnising Power Limited Partnership

TOR01: 4779810: v2

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

AND IN THE MATTER OF an application by McLean's
Mountain Wind Limited Partnership. for an Order granting
leave to amend the form of Connection Agreement
between McLean's Mountain Wind Limited Partnership and
Hydro One Networks Inc.

**APPLICATION FOR LEAVE TO AMEND A TERM IN THE CONNECTION
AGREEMENT BETWEEN MCLEAN'S MOUNTAIN WIND LIMITED PARTNERSHIP
AND HYDRO ONE NETWORKS INC.**

FILED: OCTOBER 16, 2013

Applicant

McLean's Mountain Wind Limited
Partnership
30 St. Clair Ave. West, Suite 1700
Toronto, Ontario M4V 3A1

Mr. Gordon Potts

Tel: (647) 288-1223
Fax: (416) 926-6266
gpotts@northlandpower.ca

Counsel to the Applicant

Borden Ladner Gervais LLP
Suite 4100
40 King Street West
Toronto, Ontario M5H 3Y4

James C. Sidlofsky

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EXHIBIT LIST

Exhibit	Tab	Schedule	Contents
A			Administration
	1	1	Exhibit List
	2	1	Application
	3	1	Summary of Pre-filed Evidence
		2	List of Interested Parties
		3	Letters of Direction, Notices, Procedural Orders
B			Applicant's Pre-filed Evidence
	1	1	Proposed Single Line Diagram
		2	Copy of Plan 31R-3942
		3	Markup of Plan 31R-3942 showing disconnect switches and MSOs
		4	System Impact Assessment
		5	Customer Impact Assessment
		6	Current Schedule of Construction

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

AND IN THE MATTER OF an application by McLean's
Mountain Wind Limited Partnership. for an Order granting
leave to amend the form of Connection Agreement
between McLean's Mountain Wind Limited Partnership and
Hydro One Networks Inc.

**APPLICATION FOR LEAVE TO AMEND A TERM IN THE CONNECTION
AGREEMENT BETWEEN MCLEAN'S MOUNTAIN WIND LIMITED PARTNERSHIP
AND HYDRO ONE NETWORKS INC.**

FILED: OCTOBER 16, 2013

APPLICATION

1. McLean's Mountain Wind Limited Partnership (the "Applicant") is a limited partnership constituted under the laws of the Province of Ontario. The Applicant's general partner is McLean's Mountain Wind GP Inc. ("McLean's GP"), is equally owned by Northland Power Inc. ("NPI") and Mnidoo Mnising Power Limited Partnership ("MMP"). NPI and MMP are also the limited partners of the Applicant.
2. NPI is an Ontario corporation with its head office in the city of Toronto. Founded in 1987, NPI is an experienced developer, owner and operator of renewable power generation in Canada and abroad. NPI activities include developing, constructing, managing, financing and owning renewable energy facilities.
3. MMP's general partner is Mnidoo Mnising Power General Partner Inc. MMP has six (6) First Nations as limited partners, namely, Aundeck Omni Kaning First Nation, M'chigeeng First Nation, Sheguiandah First Nation, Sheshegwaning First Nation, Whitefish River First Nation, and Zhiibaahaasing First Nation. MMP was

formed to lead renewable energy projects on Manitoulin Island in order to protect First Nations' rights, heritage and to ensure the future for First Nations' youth.

4. On April 12, 2010 the Applicant received two contracts from the Ontario Power Authority ("OPA") for the purchase of electricity generated by wind turbines through the Ontario Feed-in-Tariff ("FIT") program (enabled by the *Green Energy and Green Economy Act, 2009*) with contract capacities of 50 MW and 10 MW. The FIT contracts are for the McLean's Mountain Wind Farm project ("MMWF Project"), a wind farm located south of the community of Little Current, in the Municipality of Northeastern Manitoulin and the Islands ("NEMI"), geographic Township of Howland, and the geographic Township of Bidwell in the District of Manitoulin, Ontario. The MMWF Project falls within the traditional lands of the Anishnabee of Mnidoo Mnising.
5. By its Decision and Order dated June 28, 2013, the Board granted the Applicant leave to construct transmission facilities (the "Transmission Facilities") for the connection of the MMWF Project to the Ontario electricity grid (Board File No. EB-2011-0394). The Transmission Facilities include a single circuit overhead transmission line, a 1 km section of submarine cable, a switching station, a transformer station, and associated facilities. The Transmission Facilities will connect the MMWF Project to the IESO-controlled grid on Goat Island. The licensed transmitter to whose system the Applicant will be connecting is Hydro One Networks Inc. ("Hydro One"). Construction of the Transmission Facilities is currently underway.
6. The Board's Transmission System Code (the "TSC") requires the Applicant to enter into a connection agreement with Hydro One in the form set out in Appendix 1 of the TSC (in the case of a generator customer, the form of Connection Agreement is Appendix 1, Version B).

7. Section 4.1.2 of the TSC provides that:

"A transmitter may not enter into a connection agreement on terms and conditions other than those set forth in the applicable version of the connection agreement set out in Appendix 1 or amend the terms and conditions of a connection agreement relative to the terms and conditions set forth in the applicable version of the connection agreement set out in Appendix 1 except as expressly contemplated in the applicable version of the connection agreement set out in Appendix 1 or with the prior approval of the Board."

8. Section 1.2.1 of Schedule E to the Connection Agreement provides:

1.2. Isolation from the Transmission System

1.2.1. The Customer shall provide an isolating disconnect switch or device at the point or junction between the Transmitter and the Customer, i.e., at the point of the interconnection, which physically and visually opens the main current-carrying path and isolates the Customer's facility from the transmission system.

9. Section 1.2.2 then sets out the criteria that the isolating disconnect switch must meet.

10. The Applicant hereby applies to the Board for approval to amend Section 1.2.1 of Schedule E to the Connection Agreement by deleting the existing provision and substituting for it the following section 1.2.1:

1.2.1. The Customer shall provide a mid span opener (MSO) at the point or junction between the Transmitter and the Customer, i.e., at the point of the interconnection, which physically and visually opens the main current-carrying path and isolates the Customer's facility from the transmission system.

11. In conjunction with the proposed amendment set out above, the Applicant requests that the Board approve the deletion of Section 1.2.2 as there will no longer be an isolating disconnect switch at the point of the interconnection.

12. To be clear, the Applicant will be installing an isolating disconnect switch, but it will not be located at the defined point of the interconnection. As discussed in the Applicant's pre-filed evidence, this Application is being made because Hydro One does not currently have its own independent right to access the lands on which the isolating disconnect switch will be located (as part of the Applicant's

switching station), but it does have full access to the lands under which the MSOs will be located.

13. The Applicant and Hydro One are agreeable to an arrangement whereby the tap conductor from Hydro One's 115kV transmission line to the MSOs (and including the MSOs) will be owned, operated, and maintained by Hydro One. This portion of line is within lands over which Hydro One has easement rights. The tap conductor from the MSOs to the disconnect switch in the Applicant's switching station will be owned by the Applicant. Accordingly, subject to the Board's approval of the current Application, the MSO's would be considered the demarcation point separating Hydro One's facilities from the Applicant's.
14. There is no change in the configuration of the Transmission Facilities as a result of this Application. The Application is only necessary in order to deal with ownership and land rights issues related to these Transmission Facilities and associated Hydro One facilities. Accordingly, the System Impact Assessment ("SIA") and Customer Impact Assessment ("CIA") issued by the Independent Electricity System Operator (the "IESO") and Hydro One, respectively, remain applicable.
15. The list of interested parties includes Hydro One and the IESO. A list of interested parties is provided in Exhibit A, Tab 3, Schedule 2 to this Application.
16. A copy of the approved SIA (Addendum 3), dated September 4, 2013, may be found at Exhibit B, Tab 1, Schedule 4. A copy of the approved CIA (Revision 1), dated October 22, 2010, may be found at Exhibit B, Tab 1, Schedule 5. A single line diagram of the proposed connection is provided at Exhibit B, Tab 1, Schedule 1.

17. The Application is supported by written pre-filed evidence which may be amended and updated from time to time prior to the Board's final decision on this Application.
18. The Applicant respectfully requests that the Board issue a Decision in this matter at its earliest opportunity without the necessity of conducting a hearing as provided by subsection 21(4) of the *Ontario Energy Board Act, 1998*, S.O. 1998, c.15, Schedule B (the "OEB Act") as no other party will be adversely affected in a material way by the outcome of this proceeding. The Applicant also notes that section 3.0.13 of the TSC provides, consistent with subsection 70.1(3) of the OEB Act, that any matter under the TSC that requires a determination by the Board may be determined without a hearing or through an oral, written or electronic hearing, at the Board's discretion.
19. The following are the names of the Applicant's authorized representatives for the purpose of serving documents on the Applicant in this proceeding:

Mr. Gordon Potts	McLean's Mountain Wind Limited Partnership
Address for service:	30 St. Clair Ave. West, Suite 1700 Toronto, Ontario M4V 3A1
Telephone:	647.288.1223
Facsimile:	416.926.6266
E-mail:	gpotts@northlandpower.ca

Mr. Art Jacko	Mnidoo Mnising Power Limited Partnership
Address for service:	c/o United Chiefs & Councils of Mnidoo Mnising P.O. Box 275 M'Chigeeng, Ontario P0P 1G0
Telephone:	705.377.5307
Facsimile:	705.377.5309
E-mail:	ajacko@uccm.ca

Mr. James C. Sidlofsky	Borden Ladner Gervais LLP
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Address for service: Suite 4100, 40 King St West
Scotia Plaza
Toronto, Ontario
M5H 3Y4

Telephone: 416.367.6277
Facsimile: 416.361.2751
E-mail: jsidlofsky@blg.com

20. Therefore, the Applicant respectfully requests:

- (a) Approval to amend Schedule E, section 1.2.1 of the Connection Agreement, as specified herein;
- (b) If the relief in paragraph (a), above, is granted, approval to amend the Connection Agreement by deleting Schedule E, section 1.2.2; and
- (c) Such order(s) as necessary for the resolution of this matter and the granting of the requested approval without the need for a hearing as provided in section 21(4) of the OEB Act.

DATED OCTOBER 16, 2013

McLean's Mountain Wind Limited Partnership,
by its counsel Borden Ladner Gervais LLP

Original signed by James C. Sidlofsky
Per: James C. Sidlofsky

TOR01: 5314005: v6

PRE-FILED EVIDENCE

Introduction:

1. McLean's Mountain Wind Limited Partnership (the "Applicant") is a limited partnership constituted under the laws of the Province of Ontario. The Applicant's general partner is McLean's Mountain Wind GP Inc. ("McLean's GP"), is equally owned by Northland Power Inc. ("NPI") and Mnidoo Mnising Power Limited Partnership ("MMP"). NPI and MMP are also the limited partners of the Applicant.
2. NPI is an Ontario corporation with its head office in the city of Toronto. Founded in 1987, NPI is an experienced developer, owner and operator of renewable power generation in Canada and abroad. NPI activities include developing, constructing, managing, financing and owning renewable energy facilities.
3. MMP's general partner is Mnidoo Mnising Power General Partner Inc. MMP has six (6) First Nations as limited partners, namely, Aundeck Omni Kaning First Nation, M'chigeeng First Nation, Sheguiandah First Nation, Sheshegwaning First Nation, Whitefish River First Nation, and Zhiibaahaasing First Nation. MMP was formed to lead renewable energy projects on Manitoulin Island in order to protect First Nations' rights, heritage and to ensure the future for First Nations' youth.
4. On April 12, 2010 the Applicant received two contracts from the Ontario Power Authority ("OPA") for the purchase of electricity generated by wind turbines through the Ontario Feed-in-Tariff ("FIT") program (enabled by the *Green Energy and Green Economy Act, 2009*) with contract capacities of 50 MW and 10 MW. The FIT contracts are for the McLean's Mountain Wind Farm project ("MMWF Project"), a wind farm located south of the community of Little Current, in the Municipality of Northeastern Manitoulin and the Islands ("NEMI"), geographic Township of Howland, and the geographic Township of Bidwell in the District of

Manitoulin, Ontario. The MMWF Project falls within the traditional lands of the Anishnabee of Mnidoo Mnising.

5. By its Decision and Order dated June 28, 2013, the Board granted the Applicant leave to construct transmission facilities (the "Transmission Facilities") for the connection of the MMWF Project to the Ontario electricity grid (Board File No. EB-2011-0394). The Transmission Facilities include a single circuit overhead transmission line, a 1 km section of submarine cable, a switching station, a transformer station, and associated facilities. The Transmission Facilities will connect the MMWF Project to the IESO-controlled grid on Goat Island. The licensed transmitter to whose system the Applicant will be connecting is Hydro One Networks Inc. ("Hydro One"). Construction of the Transmission Facilities is currently underway.
6. The Applicant understands that Hydro One and the Independent Electricity System Operator (the "IESO") do not object to the relief requested in this Application. A copy of the IESO's approved System Impact Assessment ("SIA"), Addendum 3, dated September 4, 2013, may be found at Exhibit B, Tab 1, Schedule 4. A copy of Hydro One's approved Customer Impact Assessment ("CIA"), Revision 1, dated October 22, 2010, may be found at Exhibit B, Tab 1, Schedule 5. A single line diagram of the proposed connection is provided at Exhibit B, Tab 1, Schedule 1.

The Connection Agreement:

7. Section 4.1.1 of the Board's Transmission System Code (the "TSC") requires the Applicant to enter into a connection agreement with Hydro One in the form set out in Appendix 1 of the TSC (in the case of a generator customer, the form of Connection Agreement is Appendix 1, Version B).
8. Section 1.2.1 of Schedule E to the Connection Agreement provides:
 - 1.2. Isolation from the Transmission System

- 1.2.1. The Customer shall provide an isolating disconnect switch or device at the point or junction between the Transmitter and the Customer, i.e., at the point of the interconnection, which physically and visually opens the main current-carrying path and isolates the Customer's facility from the transmission system.
9. Section 1.2.2 then sets out the criteria that the isolating disconnect switch must meet, as follows:
 - 1.2.2. The isolating disconnect switch shall meet the following criteria:
 - 1.2.2.1. it shall simultaneously open all phases (i.e., group-operated open/close) to the connection;
 - 1.2.2.2. it shall be lockable in the open and closed positions;
 - 1.2.2.3. when the device is used as part of the HVI failure protection system, it shall be motor-operated and equipped with appropriate control circuitry; and
 - 1.2.2.4. it shall be suitable for safe operation under the conditions of use.
10. Under section 4.1.2 of the TSC, amendments to the form of Connection Agreement are permitted only where expressly contemplated in the Connection Agreement or with the prior approval of the Board. The form of Connection Agreement does not contemplate amendments to section 1.2.1 or 1.2.2 of Schedule E thereto, and as a result, it is necessary to seek and obtain the Board's approval of amendments to those sections.
11. The Applicant is applying to the Board for approval to amend Section 1.2.1 of Schedule E to the Connection Agreement by deleting the existing provision and substituting for it the following section 1.2.1:
 - 1.2.1. The Customer shall provide a mid span opener (MSO) at the point or junction between the Transmitter and the Customer, i.e., at the point of the interconnection, which physically and visually opens the main current-carrying path and isolates the Customer's facility from the transmission system.
12. In conjunction with the proposed amendment set out above, the Applicant is requesting that the Board approve the deletion of Section 1.2.2 as there will no longer be an isolating disconnect switch at the point of the interconnection.

The Need for the Amendment to the Connection Agreement:

13. As noted in the Application, the Applicant will be installing an isolating disconnect switch. This can be seen in the single line diagram of the proposed connection at Exhibit B, Tab 1, Schedule 1, and it has been shown in the markup of Registered Plan 31R-3942 showing disconnect switches and MSOs at Exhibit B, Tab 1, Schedule 3 (a copy of the Plan without disconnect switches and MSOs can be found at Exhibit B, Tab 1, Schedule 2). However, with the amendment proposed in the Application, the MSOs, and not the disconnect switches, will be located at the point of interconnection.
14. This Application is being made because Hydro One does not currently have its own independent right to access the lands on which the isolating disconnect switch will be located (as part of the Applicant's switching station), but it does have full access to the lands under which the MSOs will be located. In the markup of Registered Plan 31R-3942 showing disconnect switches and MSOs (Exhibit B, Tab 1, Schedule 3), Hydro One has easement rights over Part 1 on the Plan, and the MSOs are to be located on that part. The Applicant has easement rights over Parts 2, 3 and 4 on the Plan, and the disconnect switches are to be located in the vicinity of the boundary between Parts 2 and 3.
15. The Applicant is attempting, on Hydro One's behalf, to obtain an easement over the Part 2 lands for the benefit of Hydro One in order that Hydro One can own and operate the circuits between the disconnect switches and the MSOs, but it is not clear whether or when an easement would be obtainable. As a result, representatives of the Applicant and Hydro One have discussed this matter and are agreeable to an arrangement whereby the tap conductor from Hydro One's 115kV transmission line to the MSOs, and the MSOs themselves, will be owned, operated, and maintained by Hydro One. This portion of line is within lands over which Hydro One has easement rights. The tap conductor from the MSOs to the disconnect switch in the Applicant's switching station will be owned by the

Applicant. Accordingly, subject to the Board's approval of the current Application, the MSO's would be considered the demarcation point separating Hydro One's facilities from the Applicant's, and there will be no issue as to Hydro One's rights to access those facilities for the purposes of operations and maintenance.

16. The Applicant wishes to emphasize that there is no change in the configuration of the Board approved Transmission Facilities as a result of this Application. The Application is only necessary in order to deal with ownership and land rights issues related to these Transmission Facilities and associated Hydro One facilities. Accordingly, the IESO's SIA and Hydro One's CIA remain applicable. The Applicant has discussed this matter with IESO representatives and understands that the IESO does not oppose the proposed amendment of the Connection Agreement. The IESO has also been included as an interested party and the Applicant will give the IESO notice of this Application.
17. The Applicant is attempting to obtain correspondence from Hydro One and the IESO confirming that they have no objections to the Application, and will provide copies of that correspondence when it is available.

Timing and the Disposition of this Proceeding Without a Hearing:

18. As noted previously, construction of the Transmission Facilities is underway, and the Applicant anticipates that the Transmission Facilities will be energized early November of this year. Exhibit B, Tab 1, Schedule 6 is an updated construction schedule showing this anticipated energization date.
19. Hydro One will require the Applicant to enter into the Connection Agreement prior to energizing the connection, and accordingly, it is important that this proposed amendment be addressed by the Board as expeditiously as possible.

20. Subsection 21(4) of the OEB Act provides as follows:

No hearing

- (4) Despite section 4.1 of the Statutory Powers Procedure Act, the Board may, in addition to its power under that section, dispose of a proceeding without a hearing if,
 - (a) no person requests a hearing within a reasonable time set by the Board after the Board gives notice of the right to request a hearing; or
 - (b) the Board determines that no person, other than the applicant, appellant or licence holder will be adversely affected in a material way by the outcome of the proceeding and the applicant, appellant or licence holder has consented to disposing of a proceeding without a hearing.
 - (c) Repealed: 2003, c. 3, s. 20 (1).
- 21. The Applicant respectfully requests that the Board only require notice to be given to Hydro One and the IESO, and that in the absence of an objection from either entity the Board proceed to grant the requested relief without conducting a hearing. The relief being requested in this Application is related only to land matters and the Connection Agreement specific to the Applicant and Hydro One and does not change the facilities to be constructed by Hydro One and the Applicant. As discussed above, both MSOs and disconnect switches are being installed, so that no precedent for alternative facilities is being created here. The Applicant submits that no other party will be adversely affected in a material way, and that the granting of the requested relief will be consistent with the Board's objectives under section 1 of the OEB Act.
- 22. The Applicant consents to the disposition of this proceeding without holding a hearing.

LIST OF INTERESTED PARTIES

Interested Party	Contact Information
Hydro One Networks Inc.	483 Bay Street North Tower, 15th Floor Reception Toronto, Ontario M5G 2P5
Independent Electricity System Operator	655 Bay Street Suite 410, P.O. Box 1 Toronto, ON M5G 2K4

LETTERS OF DIRECTION, NOTICES & PROCEDURAL ORDERS

None at time of Application (to be updated)

SINGLE LINE DIAGRAM OF PROPOSED CONNECTION

COPY OF REGISTERED PLAN 31R-3942

I REQUIRE THIS PLAN TO BE DEPOSITED
UNDER THE LAND TITLES ACT

PLAN 31R-3942

RECEIVED AND DEPOSITED

AUGUST 14, 2013
LITTLE CURRENT, ONT.

DATE 2013-Aug-14

"Donna Noble"

REPRESENTATIVE FOR THE LAND
REGISTRAR FOR THE LAND TITLES
DIVISION OF MANITOULIN (31)

PART	LOT	CONCESSION	PIN
1-3	PART OF GOAT ISLAND		PART OF PIN 47140-0027
4	PART OF WATER LOT KG-37		PART OF PIN 47148-0021
PART 1 IS SUBJECT TO EASEMENT AS IN MD7329			

PLAN OF SURVEY OF PART OF
GOAT ISLAND
AND PART OF
WATER LOT KG-37
MUNICIPALITY OF THE TOWN OF
NORTHEASTERN MANITOULIN & THE ISLANDS
DISTRICT OF MANITOULIN

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

- THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
- THE FIELD SURVEY WAS COMPLETED ON THE 14TH DAY OF AUGUST, 2013.

AUGUST 14, 2013
LITTLE CURRENT, ONTARIO

GORDON E. KEATLEY
ONTARIO LAND SURVEYOR

LEGEND

■	DENOTES	SURVEY MONUMENT FOUND
□	DENOTES	SURVEY MONUMENT PLANTED
SQ	DENOTES	SQUARE
IB	DENOTES	IRON BAR
SIB	DENOTES	STANDARD IRON BAR
SSIB	DENOTES	SHORT STANDARD IRON BAR
AIB	DENOTES	IB LESS THAN 0.6m LONG DRILLED IN ROCK
P	DENOTES	PLAN 31R-3920 BY G.R. KEATLEY, O.L.S.
MS	DENOTES	MEASURED
NVM	DENOTES	NO VISIBLE MARKINGS
1298	DENOTES	W.J. KEATLEY, O.L.S.
1552	DENOTES	P.M. BULL, O.L.S.
1883	DENOTES	G.R. KEATLEY, O.L.S.
NTS	DENOTES	DISTANCE NOT TO SCALE

METRIC

DISTANCES & COORDINATES SHOWN HEREON ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

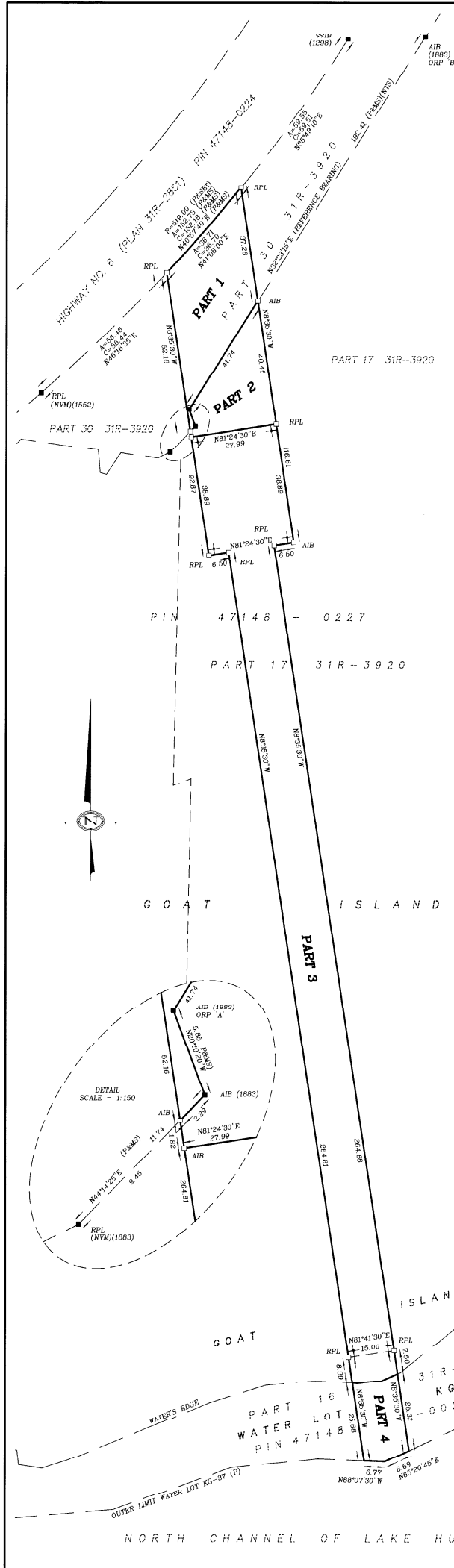
DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999639



NOTE
BEARINGS ARE UTM GRID REFERRED TO PART OF THE EASTERLY LIMIT OF PART 30, PLAN 31R-3920 AS SHOWN ON SAID PLAN HAVING A BEARING OF N32°22'50"E REFERRED TO THE CENTRAL MERIDIAN OF UTM ZONE 17 (81° WEST LONGITUDE) NAD83

COORDINATES DERIVED FROM GPS OBSERVATIONS REFERRED TO ORP'S 'A' & 'B' FROM PLAN 31R-3920 AND ASSOCIATED DIGITAL FILE: UTM ZONE 17, NAD83 (ORIG.)		
COORDINATES TO URBAN ACCURACY PER SEC. 14(2) OF O.REG. 216/10		
POINT ID	NORTHING	EASTING
ORP 'A'	5092582.25	430020.75
ORP 'D'	5092744.60	430123.75

COORDINATES CANNOT IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN



DATE: AUG. 13, 2013 SCALE = 1:750 FILE: 5416

KEATLEY SURVEYING LTD.
P.O. BOX 578
LITTLE CURRENT, ONTARIO
705-368-2221

**COPY OF REGISTERED PLAN 31R-3942 SHOWING
DISCONNECT SWITCHES AND MSOs**

I REQUIRE THIS PLAN TO BE DEPOSITED
UNDER THE LAND TITLES ACT

PLAN 31R-3942

RECEIVED AND DEPOSITED

AUGUST 14, 2013
LITTLE CURRENT, ONT.

DATE 2013-Aug-14

Gordon E. Keatley
GORDON E. KEATLEY
ONTARIO LAND SURVEYOR

"Donna Noble"
REPRESENTATIVE FOR THE LAND
REGISTRAR FOR THE LAND TITLES
DIVISION OF MANITOULIN (31)

PART	LOT	CONCESSION	PIN
1-3	PART OF GOAT ISLAND		PART OF PIN 47148-0027
4	PART OF WATER LOT KG-37		PART OF PIN 47148-0021
PART 1 IS SUBJECT TO EASEMENT AS IN MD7329			

PLAN OF SURVEY OF PART OF
GOAT ISLAND
AND PART OF
WATER LOT KG-37
MUNICIPALITY OF THE TOWN OF
NORTHEASTERN MANITOULIN & THE ISLANDS
DISTRICT OF MANITOULIN

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

- THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
- THE FIELD SURVEY WAS COMPLETED ON THE 14TH DAY OF AUGUST, 2013.

AUGUST 14, 2013
LITTLE CURRENT, ONTARIO

Gordon E. Keatley
GORDON E. KEATLEY
ONTARIO LAND SURVEYOR

LEGEND

■	DENOTES	SURVEY MONUMENT FOUND
□	DENOTES	SURVEY MONUMENT PLANTED
SQ	DENOTES	SQUARE
IB	DENOTES	IRON BAR
SIB	DENOTES	STANDARD IRON BAR
SSIB	DENOTES	SHORT STANDARD IRON BAR
AIB	DENOTES	IB LESS THAN 0.6m LONG DRILLED IN ROCK
P	DENOTES	PLAN 31R-3920 BY G.R. KEATLEY, O.L.S.
MS	DENOTES	MEASURED
NVM	DENOTES	NO VISIBLE MARKINGS
1298	DENOTES	W.J. KEATLEY, O.L.S.
1552	DENOTES	P.M. BULL, O.L.S.
1883	DENOTES	G.R. KEATLEY, O.L.S.
NTS	DENOTES	DISTANCE NOT TO SCALE

METRIC

DISTANCES & COORDINATES SHOWN HEREON ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999639.

SCALE 1:750 METRES
0 5 10 15 20 25 30 40 50 75

NOTE
BEARINGS ARE UTM GRID REFERENCED TO PART OF THE EASTERLY LIMIT OF PART 30, PLAN 31R-3920 AS SHOWN ON SAID PLAN HAVING A BEARING OF N32°22'50"E REFERRED TO THE CENTRAL MERIDIAN OF UTM ZONE 17 (81° WEST LONGITUDE) NAD83.

COORDINATES DERIVED FROM GPS OBSERVATIONS REFERRED TO ORP'S 'A' & 'B' FROM PLAN 31R-3920 AND ASSOCIATED DIGITAL FILE: UTM ZONE 17, NAD83 (ORIG.)

COORDINATES TO URBAN ACCURACY PER SEC. 14(2) OF O.REG. 216/10

POINT ID	NORTHING	EASTING
ORP 'A'	5092562.25	430020.75
ORP 'D'	5092744.69	430129.78

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

DATE: AUG. 13, 2013 SCALE = 1:750 FILE: 5416

KEATLEY SURVEYING LTD.
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705-368-2221

COPY OF APPROVED SIA (ADDENDUM 3) DATED SEPTEMBER 4, 2013

System Impact Assessment Report 3rd Addendum

CONNECTION ASSESSMENT & APPROVAL PROCESS

Final Report

CAA ID: 2010-386
Project: McLean's Mountain Wind Farm
Applicant: McLean's Mountain L.P.

Market Facilitation Department
Independent Electricity System Operator

Date: September 4, 2013

REPORT

Document Name	System Impact Assessment Report 3rd Addendum
Issue	Final Report
Reason for Issue	First Issue
Effective Date	September 4, 2013

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. 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

Conditional Approval for Connection

This addendum updates the System Impact Assessment (SIA), first addendum and second addendum for “McLean’s Mountain Wind Farm (CAA ID 2010-386)” originally issued on October 27, 2010, March 15, 2011 and October 5, 2012, respectively. This project, proposed by McLean’s Mountain L.P. (the “connection applicant”) will be located in Manitoulin Island, Ontario, and is to connect to the IESO-controlled grid via the 115 kV circuit S2B. The planned in-service date for the proposed project is November 1, 2013.

Recently, the connection applicant has provided updated transformer and feeder impedances. Compared to the previous assessment, the revised equivalent impedance of the project has slightly decreased. A decrease in impedance would result in a reduction in the required reactive compensation; however, the applicant has indicated that it still intends to install the 2x5.5 MVar @34.5 kV capacitors as previously required. A short circuit study, collector system and line tap charging assessment, and static reactive power switching assessment were performed as part of this Addendum assessment.

This assessment concludes that the proposed connection of the project operating up to 60 MW, subject to the requirements specified in the previous SIA reports, is expected to have no material adverse impact on the reliability of the integrated power system. The full set of requirements which the connection applicant is obligated to meet for connection can be found in the McLean’s Mountain Wind Farm 2nd Addendum. The IESO recommends that a *Notification of Conditional Approval for Connection* be issued for McLean’s Mountain Wind Farm, operating up to 60 MW, subject to the implementation of the requirements listed in the previous SIA reports.

1. Data Verification

The following tables show the new and previous data for the step up transformer, collector system and line taps. The overall impedance of the project has slightly decreased, while the charging from the project's cables and circuits has increased. A single line diagram of the project is shown in **Figure 1**.

1.1 Step Up Transformer

Table 1: New step-up Transformer Data

Transformation	Rating (MVA) (ONAN)	Positive Sequence Impedance (pu)	Configuration		Zero Sequence Impedance (pu)	Tap
			HV	LV		
120/34.5	70	j0.07 $S_B=70$ MVA	Wye g	Delta	j0.07 $S_B=70$ MVA	ULTC@HV: 32 steps at 0.9375%

Table 2: Previous step-up Transformer Data

Transformation	Rating (MVA) (ONAN/ONAF/ONAF)	Positive Sequence Impedance (pu)	Configuration		Zero Sequence Impedance (pu)	Tap
			HV	LV		
125/34.5	37/50/66	j0.10 $S_B=37$ MVA	Wye g	Delta	-	ULTC@HV: 32 steps at 0.55%

1.2 Collector System

Table 3: New Collector Impedances

Circuit	Unit	Positive-Sequence Impedance (pu, $S_b=100$ MVA, $V_b=34.5$ kV)			Zero-Sequence Impedance (pu, $S_b=100$ MVA, $V_b=34.5$ kV)		
		R	X	B	R	X	B
C1	G1	0.099073	0.091958	0.009575	0.322	0.0434	0.00958
C2	G2	0.048034	0.034981	0.005212	0.138	0.0153	0.00521
C3	G3	0.057014	0.050881	0.005402	0.169	0.0209	0.00540

Table 4: Previous Collector Impedances

Circuit	Unit	Positive-Sequence Impedance (pu, Sb=100 MVA)			Zero-Sequence Impedance (pu, Sb=100 MVA, Vb=34.5 kV)		
		R	X	B	R	X	B
C1	G1	0.04781	0.11502	0.00089	Not provided	Not provided	Not provided
C2	G2	0.04781	0.11502	0.00089	Not provided	Not provided	Not provided
C3	G3	0.04781	0.11502	0.00089	Not provided	Not provided	Not provided

1.3 Tap Line

Table 5: New Line Tap Impedances

Circuit	Positive Sequence Impedance (pu, Sb=100 MVA, Vb=118.05 kV)			Zero Sequence Impedance (pu, Sb=100 MVA, Vb=118.05 kV)		
L1 Submarine	0.000181201	0.001280602	0.007194	0.000142761	0.000669563	0.007194
L2 Overhead	0.00527	0.03174	0.0055	0.00527	0.03174	0.00284

Table 6: Previous Line Tap Impedances

Circuit	Positive Sequence Impedance (pu, Sb=100MVA, Vb=118.05 kV)			Zero Sequence Impedance (pu, Sb=100MVA, Vb=118.05 kV)		
	R	X	B	R	X	B
L1 Submarine	0.000650	0.002480	0.013400	Not provided	Not provided	Not provided
L2 Overhead	0.004130	0.035260	0.004690	Not provided	Not provided	Not provided

2. Short Circuit Assessment

Fault level studies showed that the interrupting capability of the circuit breakers near the project will not be exceeded with the proposed project changes. Fault levels have slightly increased due to the decrease in overall project's equivalent impedance. As identified previously, the asymmetrical current for a L-G fault is marginally within the asymmetrical breaker capability at Martindale 115 kV.

Fault level studies were completed by Hydro One to re-examine the effects of the proposed project changes on fault levels at existing facilities in the area. Details of the study assumptions can be found in the original McLean's Mountain SIA.

Table 7 summarizes the symmetric and asymmetrical fault levels near McLean's Mountain and corresponding breaker ratings under normal operating conditions and **Table 8** summarizes the fault levels under outage conditions whereby S2B is supplied entirely by Martindale.

Table 7 Fault levels near the project (Normal S2B Operating Conditions)

Short Circuit Levels: Normal S2B Operating Conditions										
Bus	Previous Short Circuit Results				New Short Circuit Results				Breaker Ratings	
	Total Fault Current (kA)				Total Fault Current (kA)					
	Symm		Asymm		Symm		Asymm		Symm (kA)	Asym m (kA)
	3-ph fault	L-G fault	3-ph fault	L-G fault	3-ph fault	L-G fault	3-ph fault	L-G fault		
Martindale 115 kV	14.610	17.852	17.004	21.872	14.657	17.892	17.051	21.914	19.20	22.70
Martindale 230 kV	17.73	19.520	20.591	23.632	17.752	19.537	20.614	23.650	41.10	46.20
Algoma 115 kV	10.110	11.869	11.255	13.851	10.111	11.868	11.256	13.850	39.30	45.50
Algoma 230 kV	8.115	7.401	9.290	9.182	8.116	7.398	9.291	9.180	39.40	46.20
Domtar Espanola 115 kV	2.476	1.191	2.781	1.195	2.476	1.191	2.781	1.194	7.3	7.9
McLean`s Mountain 115 kV	1.542	1.653	1.624	1.804	1.622	1.321	1.722	1.485	Unknown *	Unknown *

(*) The applicant will need to provide this data during the IESO Market Entry process.

Table 8 Fault levels near the project (S2B supplied entirely by Martindale 115 kV)

Short Circuit Levels: S2B supplied entirely by Martindale 115 kV										
Bus	Previous Short Circuit Results				New Short Circuit Results				Breaker Ratings	
	Total Fault Current (kA)				Total Fault Current (kA)					
	Symm		Asymm		Symm		Asymm		Symm (kA)	Asym m (kA)
	3-ph fault	L-G fault	3-ph fault	L-G fault	3-ph fault	L-G fault	3-ph fault	L-G fault		
Martindale 115 kV	15.109	18.345	17.512	22.383	15.132	18.362	17.535	22.399	19.20	22.70

3. System Impact Studies

3.1 Reactive Power Compensation

Although the revised project parameters results in a slight decrease in equivalent impedance, the connection applicant has indicated that it will still install 2x5.5 MVar static capacitors on the collector bus required for reactive compensation as indicated in the previous addendum. Two simulations were done to ensure the (i) collector system and line tap charging does not result in excessive charging and (ii) the static reactive power switching is within Market Rule requirements.

Collector System and Line Tap Charging

A simulation was performed to determine if the reactive power injection due to charging would be excessive if the wind turbine generators automatically disconnected themselves from the system during the high wind conditions, leaving only the collector system and line tap connected to the grid. It was determined that the charging in this case would be about 3.5 MVar, which is acceptable. \

Static Reactive Power Switching

Static reactive power switching will still be within 4% with the revised project parameters. The IESO requires the voltage change on a single capacitor switching to be no more than 4 % at the any point in the IESO controlled grid.

Table 9: Voltage Changes due to Static Reactive Compensation Switching

Capacitor at 34.5 kV bus	34.5 kV bus voltage	ICG connection point
Pre-switching	34.2 kV	124.5 kV
Post-switching	35.5 kV	128.1 kV
ΔV	3.8%	2.89%

Appendix A: Figures

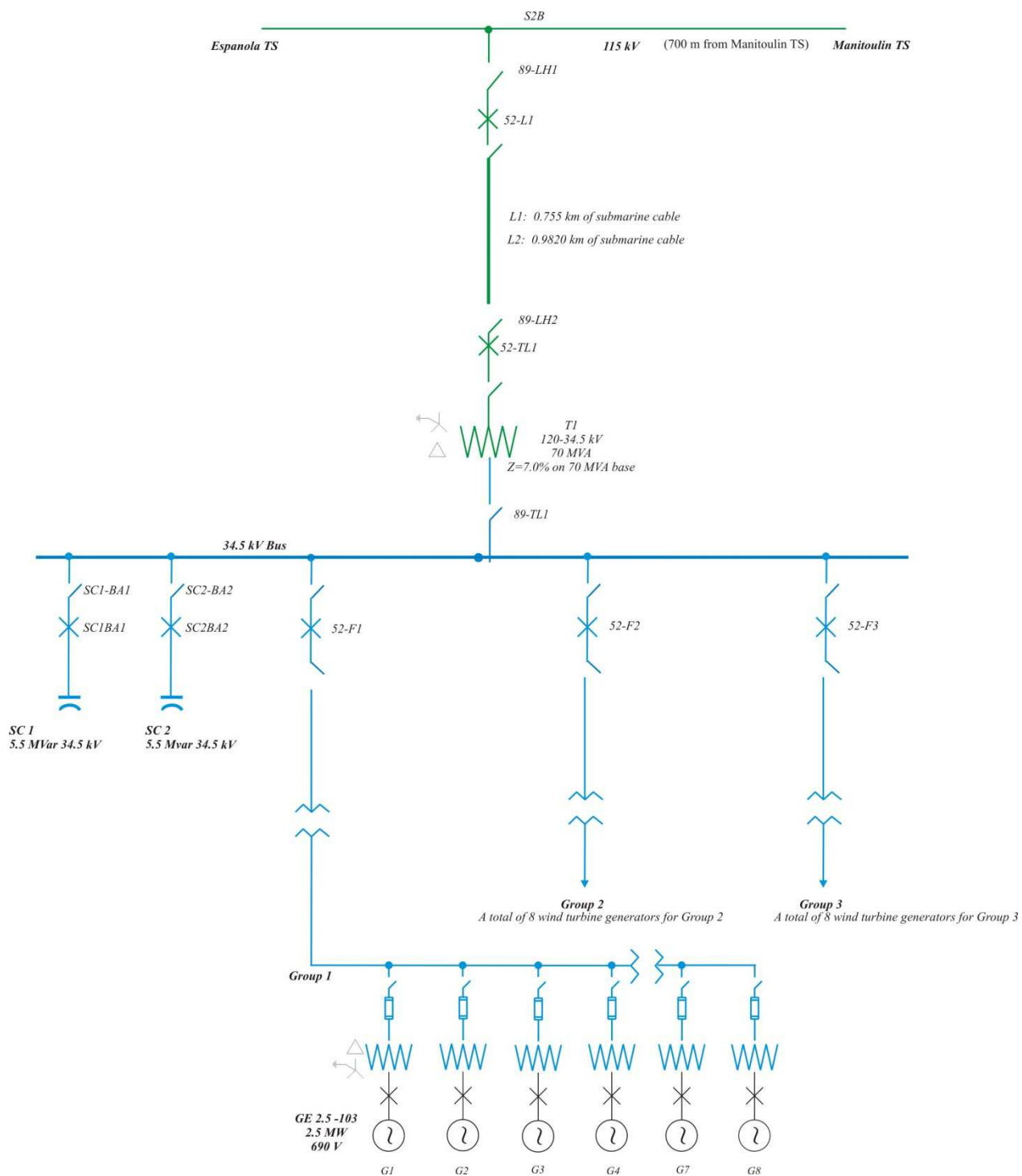


Figure 1 Single-line diagram of McLean's Mountain

COPY OF THE APPROVED CIA (REVISION 1) DATED OCTOBER 22, 2010



Hydro One Networks Inc.
483 Bay Street
Toronto, Ontario
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**CUSTOMER IMPACT ASSESSMENT
FINAL**

**Proposed 59.4 MW
McLean's Mountain Wind Farm
Generation Project**

Revision: **1**

Date: **October 22, 2010**

Prepared by:

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Approved by:

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Issued by:

Transmission System Planning Department
System Investment Division
Hydro One Networks Inc.

CUSTOMER IMPACT ASSESSMENT

Proposed 59.4MW McLean's Mountain Wind Farm Project

Disclaimer

This Customer Impact Assessment was prepared based on preliminary information available about the connection of the proposed McLean's Mountain Wind Farm Project. 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 are also 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 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.

CUSTOMER IMPACT ASSESSMENT

PROPOSED 59.4MW MCLEANS WIND FARM PROJECT

1. INTRODUCTION

1.1 Scope of the Study

This study covers the impact of the proposed McLean's Mountain Wind Farm Project (MMWFP) on the Hydro One Networks Inc. (Hydro One) system in the area. The primary focus of this study is to identify the impact on the transmission connected customer facilities and ensure that the voltage performance at these facilities meets the planning criteria. The study also assists in determining if any transmission system upgrade will be required to integrate the proposed generation during possible system conditions.

This study does not evaluate the overall impact of the MMWFP on the bulk system. The impact of MMWFP on the bulk system is the subject of the System Impact Assessment (SIA) which is issued by the Independent Electricity System Operator (IESO).

In addition, this study does not evaluate the impact of the MMWFP on the existing network's Protection and Control facilities. Protection and Control aspects will be reviewed under the Protection Impact Assessment (PIA) and during the preparation of the Connection Cost Estimate stage of the project and will be reflected in the Connection Cost Recovery Agreement (CCRA).

2. BACKGROUND

Northland Power Inc. is proposing to construct a 59.4MW wind farm under Ontario Power Authority's (OPA) Feed-In-Tariff (FIT) program. The facility, known as McLean's Mountain Wind Farm Project, consists of 33 wind turbine generators with a nameplate rating of 1.8MVA at 1.0 power factor. The facility will connect to the transmission system through a 34.5/125 kV step-up transformer and a 115 kV transmission line consisting of a 1.5km submarine cable and a 10km overhead line tapping onto S2B line between Manitoulin TS and Espanola JCT (Please refer to Fig. 1 and 2).

The proposed project will utilize 33 Vestas V90, 1.8MW wind turbine generators arranged in three groups of 11 turbines. The generators are induction generators with an output voltage of 690V. The output transformers of the individual turbines are connected to the 34.5 kV collector system for each group. The groups are then connected to the 34.5 kV bus and the bus is connected to a 34.5/115 kV step-up transformer. The transformer, which is equipped with ULTC operating between 111kV and 136kV, will connect to Hydro One's S2B 115 kV circuit.

The draft CIA was issued and sent out to IESO and impacted customers on September 29th, 2010. Several comments and questions were received from the customers. These comments have been addressed in this version of the CIA.

3. METHODOLOGY & CRITERIA

3.1 Voltage Performance - Planning Criteria

To establish the impact of incorporating the proposed MMWFP, the following post-fault voltage decline criteria were applied.

- At the Bulk Electricity System Level (115kV and up): The loss of a single transmission circuit should not result in a voltage decline greater than 10% for pre- and post- transformer tap-changer action.
- The maximum and minimum phase-to-phase voltages given in the IESO's Transmission Assessment Criteria and Canadian Standard Association document CAN-3-C235-83 were considered. However, in Northern Ontario, the maximum continuous voltage for the 230kV and 115KV systems can be as high as 260kV and 132kV respectively (from IESO document IMO_REQ_0041 Issue 5.0).

The voltage performance on Hydro One customers was assessed by monitoring the voltage performance of the 115kV stations of circuit S2B.

3.2 Power System Analysis

Power System Analysis is an integral part of the transmission planning process. It is used by Hydro One to evaluate the capability of the existing network to deliver power and energy from generating stations to provide a reliable supply to customers. Two relevant aspects of Power System Analysis were used for this assessment, namely:

- **Short-Circuit Studies:** A Short Circuit Analysis program was used to determine the impact on customers.
- **Load Flow Studies:** An AC load flow program was used to set up a base case with the MMWFP facility.

4. SHORT-CIRCUIT STUDIES

Short-circuit studies were carried out to assess the fault contribution when the new MMWFP facilities are placed in-service. The impact of the new facilities on the fault levels on Hydro One customers through the 115kV S2B circuit was analyzed.

The study results are summarized in Tables 1 and 2 below showing both symmetric and asymmetric fault currents in kA. Table 1 shows the existing fault levels based on the following assumptions:

- All existing and committed generating facilities in-service in the area.
- The maximum pre-fault voltage considered for the two voltage levels is shown on the table below.

Pre-fault Voltages (kV)	
Level	Pre-fault
220	260
115	132

Table 1: Fault Levels before Incorporating MMWFP

Fault Level Locations	Bus Voltage (kV)	Fault Levels (kA)			
		3-Phase		Line-Ground	
		Symmetrical	Asymmetrical	Symmetrical	Asymmetrical
WHITEFISH_DS	118.05	2.881	2.886	1.925	1.927
FAL_LOCKERBY	118.05	3.468	3.518	2.378	2.382
MANITOULIN_T	118.05	1.191	1.195	0.699	0.699
DOMTAR_NAIRN	118.05	2.150	2.167	1.404	1.406
MASSEY_DS	118.05	2.986	3.051	1.642	1.644
DOM_ESPANOLA	118.05	2.482	2.787	1.231	1.235
ESPANOLA_TS	118.05	2.516	2.863	1.251	1.255
CARMEUSE_LM	118.05	8.127	8.527	7.706	7.964
SPANISH_DS	118.05	4.295	4.431	2.624	2.645
SERPENT_RIV	118.05	5.011	5.156	3.369	3.410
AUX_SABLE_GS	118.05	2.955	3.039	1.612	1.618
MARTINDALE	118.05	14.325	16.681	17.542	21.507
ALGOMA	118.05	10.131	11.277	11.882	13.866
ESPANOLA_BY	44	3.911	5.088	4.926	6.623
MANITOULIN_J	44	1.764	1.805	2.374	2.460
MANITOULIN_Q	44	1.766	1.806	2.379	2.464

Table 2: Fault Levels after Incorporation of MMWFP

Fault Level Locations	Bus Voltage (kV)	Fault Levels (kA)			
		3-Phase		Line-Ground	
		Symmetrical	Asymmetrical	Symmetrical	Asymmetrical
WHITEFISH_DS	118.05	3.241	3.249	2.254	2.256
FAL_LOCKERBY	118.05	3.920	3.992	2.816	2.833
MANITOULIN_T	118.05	1.814	1.922	1.831	2.021
DOMTAR_NAIRN	118.05	2.660	2.715	1.977	1.996
MASSEY_DS	118.05	2.987	3.052	1.645	1.647
DOM_ESPANOLA	118.05	2.482	2.788	1.234	1.238
ESPANOLA_TS	118.05	2.516	2.863	1.254	1.259
CARMEUSE_LM	118.05	8.132	8.531	7.713	7.970
SPANISH_DS	118.05	4.296	4.432	2.627	2.647
SERPENT_RIV	118.05	5.012	5.157	3.371	3.412
AUX_SABLE_GS	118.05	2.955	3.039	1.615	1.620
MARTINDALE	118.05	14.750	17.128	17.990	21.989
ALGOMA	118.05	10.137	11.284	11.895	13.879
ESPANOLA_BY	44	3.911	5.088	4.926	6.623
MANITOULIN_J	44	2.245	2.475	2.938	3.365
MANITOULIN_Q	44	2.248	2.476	2.945	3.368

Table 2 shows that the fault levels after the incorporation of MMWFP meet maximum symmetrical three-phase and single line-to-ground faults (kA) of 115 kV stations as set out in Appendix 2 of the *Transmission System Code* (TSC) and reproduced below. It also meets the requirements of Hydro One equipment in the identified stations.

Nominal Voltage (kV)	Max. 3-Phase Fault (kA)	Max. SLG Fault (kA)
44	20	19
115	50	50
220	63	80
500	80	80

4.1. Impact at Stations Previously Mitigated for Fault Level

Customer Impact Assessment studies conducted for projects that have either previously connected or plan to connect prior to the connection date planned for this project have identified stations where the fault level has exceeded the limits contained in Appendix B of the *Transmission System Code* (TSC), and it was necessary to install measures to

reduce the fault level to within those contained in the TSC. The customer whose project caused the fault level to exceed the TSC limit either funded or will be required to fund the cost of this mitigation measure. The TSC requires that any customer that benefits from such an installation that connects within five calendar years of the in-service date of the mitigation measure also contribute towards the cost of the measure, and that any such payments be refunded to the original contributing customer(s). This Section of this CIA report is to report on the impact that this project has at those previously mitigated stations to see if this project is required to financially contribute to the cost for any of those measures.

Fault Level Locations	Bus Voltage (kV)	Symmetrical 3-Phase Fault level (kA)			Symmetrical L-G Fault level (kA)		
		Without MMWFP	With MMWFP	Difference if ≥ 0.01	Without MMWFP	With MMWFP	Difference if ≥ 0.01
Windsor Walker TS #1 EQ	28	17.526	17.526	0	3.053	3.053	0
Martindale Z	44	14.873	14.900	0.027	19.738	19.770	0.032
Caledonia	28	16.512	16.512	0	9.909	9.909	0
Kingsville TS	28	16.714	16.714	0	11.853	11.853	0

Table 3: Impact at Stations Previously Mitigated for Fault Levels

The results of the table above show that current L-G fault levels at Martindale 44kV bus already exceeds the TSC limits (19kA). Adding MMWFP increases the fault levels at Martindale LV bus by about 30A (≥ 0.01 kA). Therefore, MMWFP has to make a capital contribution towards the cost of the mitigation measure installed for this problem, the proportion of funding will be determined in their CCRA.

5. LOAD FLOW STUDIES

Load flow studies were carried out to analyze the impact of the new wind farm on the voltage performance of Hydro One customers in the affected area. The load flow model used for the load flow analysis performed by Hydro One was based on information supplied by the IESO.

5.1. Base Case

S2B circuit is normally operated open at Espanola. It means that half of S2B including Manitoulin is normally supplied from Martindale (S2B east) and the other half is supplied from

Algoma (S2B west). As a result, any change on S2B east (e.g., adding MMWFP) does not have a significant impact on S2B west and vice versa.

Two base cases representing the system with S2B east minimum and maximum load were used for the contingency analysis. System loads were adjusted to attain minimum and maximum flow from Martindale to S2B east which corresponds to S2B east minimum and maximum load respectively.

5.2. Impact of Adding MMWFP

Based on IESO requirements, when modeling the wind farm, it is assumed that a dynamic reactive power device with a capability of -21/+29 MVar is installed at the collector bus to compensate for the dynamic reactive power capability of the facility. It is also assumed that a static compensation device of 7MVar is installed at the collector bus to compensate for the losses within the wind farm.

The impact of incorporating MMWFP on S2B bus voltages for minimum and maximum load conditions is shown in Tables 1 and 2 of Appendix 1. No voltage limit violation is observed in Tables 1 and 2. Therefore, the impact of adding MMWFP on the system is acceptable.

5.3. Contingency Analysis

The following single element contingencies were identified as being potentially critical after the connection of MMWFP:

- **Contingency #1:** Loss of MMWFP
- **Contingency #2:** Loss of S6F
- **Contingency #3:** Loss of S5M
- **Contingency #4:** Loss of L1S

The first contingency, loss of MMWFP, was analyzed for two cases, minimum load on S2B east, as well as maximum load on S2B east. The results for this contingency, which is the worst contingency, are represented in Tables 4 and 5.

**Table 4: Loss of MMWFP Voltage Performance
(S2B East Minimum Load)**

Bus Name	Base Case	IMM	%IMM	ULTC	%ULTC
Algoma	123.6	123.8	0.16	123.8	0.16
Manitoulin TS	122.2	126.6	3.60	126.6	3.60
Manitoulin 44kV	46.5	48.1	3.44	46.3	-0.43
WhiteFish 115kV	124.1	126.9	2.26	126.9	2.26
WhiteFish 12.5kV	13	13.3	2.31	13.3	2.31
Espanola J	123.2	127	3.08	127	3.08
Domtar-Narin J	123.4	127	2.92	127	2.92
Vermillion J	124.3	127	2.17	127	2.17
Martindale TS	126	127	0.79	127	0.79

**Table 5: Loss of MMWFP Voltage Performance
(S2B East Maximum Load)**

Bus Name	Base Case	IMM	%IMM	ULTC	%ULTC
Algoma	123.6	123.5	-0.08	123.5	-0.08
Manitoulin TS	119.3	116.8	-2.10	116.8	-2.10
Manitoulin 44kV	46.8	45.8	-2.14	45.8	-2.14
WhiteFish 115kV	123.1	122.3	-0.65	122.3	-0.65
WhiteFish 12.5kV	12.5	12.4	-0.80	12.4	-0.80
Espanola J	121.5	119.9	-1.32	119.9	-1.32
Domtar-Narin J	122	120.6	-1.15	120.6	-1.15
Vermillion J	123.5	122.9	-0.49	122.9	-0.49
Martindale TS	126	126	0.00	126	0.00

The other three contingency scenarios (i.e., loss of another circuit of Martindale 115kV bus) were analyzed for S2B east minimum load. The results are summarized in Tables 1 to 6 of Appendix 2 for the following two cases:

- before connecting MMWFP to Hydro One network
- after connecting MMWFP to Hydro One network

The tables show the voltages immediately after the contingency (**IMM**) and after under-load tap-changer operations (**ULTC**). The percentage changes in relation to the pre-contingency values are also provided.

The contingency analyses performed indicate that the post-contingency voltage performance at the monitored stations is acceptable. Circuit loadings were also monitored. The introduction of MMWFP did not adversely impact post-contingency flows. It is reasonable to conclude that the impact of these contingencies on customer's facilities is acceptable.

6. CUSTOMER RELIABILITY

The proposed MMWFP will have a high voltage breaker connected at the point of common coupling on S2B. Faults along the line tap will be cleared by the breaker and have minimum impact on the customers supplied by circuit S2B.

7. CONCLUSIONS AND RECOMMENDATIONS

In the connection approval process, a Customer Impact Assessment (CIA) report is carried out for a specific connection proposal that has been submitted to the IESO for System Impact Assessment (SIA). Many of the study parameters are established in the SIA. This study was carried in advance of a SIA with the preliminary information provided by Northland Power Inc. and intended to provide a general indication on the potential impact of the McLean's Mountain Wind Farm Project connection on Hydro One customers. The study includes short circuit and voltage performance analyses on transformer stations connected to S2B circuit. Two base cases, representing S2B east minimum and maximum loads, were used in the contingency analyses. The study did not include any consideration for potential impact of the proposed generation connection on the BES. This is considered under the SIA carried out by the IESO.

The studies carried out indicated that for different load levels considered, no adverse impact on voltage performance to the customers in the area would be expected. The study indicates insignificant increase in short circuit levels at the 115kV level. However, connecting MMWFP will increase the short circuit levels on Martindale 44kV bus by 32A. Since the short circuit levels on Martindale TS are already above the TSC limit, mitigation measures are required to be put in place prior to connecting the wind farm and MMWFP will be required to contribute towards the mitigation cost if they wish to continue with their connection. Potentially impacted customers will need to review the adequacy of their equipment.

8. REFERENCES

- [1] Independent Electricity Market Operator (IMO), *IMO Transmission Assessment Criteria*, Issue 5.0.
- [2] Ontario Energy Board, **Transmission System Code**, July 25, 2005

Appendix 1: Impact of Incorporating MMWFP

Tables 1 and 2 summarize the impact of incorporating MMWFP for S2B east minimum and maximum load conditions respectively.

**Table 1: Impact of Incorporating MMWFP
(Martindale Minimum Flow Condition)**

Bus Name	Base Case (Minimum Load)	After Connection of MMWFP
Algoma	123.8	123.6
Manitoulin TS	126.6	122.2
Manitoulin 44kV	46.9	46.5
WhiteFish 115kV	126.9	124.1
WhiteFish 12.5kV	13.3	13
Espanola J	127	123.2
Domtar-Narin J	127	123.4
Vermillion J	127	124.3
Martindale TS	127	126

**Table 2: Impact of Incorporating MMWFP
(Martindale Maximum Flow Condition)**

Bus Name	Base Case (Maximum Load)	Base Case After Connection of MMWFP
Algoma	123.5	123.6
Manitoulin TS	116.8	119.3
Manitoulin 44kV	46.9	46.8
WhiteFish 115kV	122.3	123.1
WhiteFish 12.5kV	12.4	12.5
Espanola J	119.9	121.5
Domtar-Narin J	120.6	122
Vermillion J	122.9	123.5
Martindale TS	126	126

Appendix 2: Contingency Analysis (Loss of S6F, S5M and L1S)

The results of contingency analysis for the loss of S6F, S5M and L1S are summarized in Tables 1 to 6. Tables 1, 3 and 5 show the impact of losing S6F, S5M and L1S before incorporating the MMWFP, while Tables 2, 4 and 6 show the results after connecting the wind farm. For all mentioned contingency, a base case with S2B east minimum load was used.

**Table 1: Loss of S6F before Connecting MMWFP
Voltage Performance**

Bus Name	Base Case	IMM	%IMM	ULTC	%ULTC
Algoma	123.8	124.1	0.24	124.1	0.24
Manitoulin TS	126.6	127.9	1.03	127.9	1.03
Manitoulin 44kV	46.9	47.4	1.07	46.7	-0.43
WhiteFish 115kV	127	128.2	0.94	128.2	0.94
WhiteFish 12.5kV	13.3	13.4	0.75	13.4	0.75
Espanola J	127	128.2	0.94	128.2	0.94
Domtar-Narin J	127	128.2	0.94	128.2	0.94
Vermillion J	127	128.2	0.94	128.2	0.94
Martindale TS	127	128.2	0.94	128.2	0.94

**Table 2: Loss of S6F after Connecting MMWFP
Voltage Performance**

Bus Name	Base Case	IMM	%IMM	ULTC	%ULTC
Algoma	123.6	123.9	0.24	123.9	0.24
Manitoulin TS	122.2	122.9	0.57	122.9	0.57
Manitoulin 44kV	46.5	46.7	0.43	46.7	0.43
WhiteFish 115kV	124.1	125.1	0.81	125.1	0.81
WhiteFish 12.5kV	13	13.1	0.77	13.1	0.77
Espanola J	123.2	124	0.65	124	0.65
Domtar-Narin J	123.4	124.3	0.73	124.3	0.73
Vermillion J	124.3	125.3	0.80	125.3	0.80
Martindale TS	126	127.1	0.87	127.1	0.87

**Table 3: Loss of S5M before Connecting MMWFP
Voltage Performance**

Bus Name	Base Case	IMM	%IMM	ULTC	%ULTC
Algoma	123.8	123.9	0.08	123.9	0.08
Manitoulin TS	126.6	127.1	0.39	127.1	0.39
Manitoulin 44kV	46.9	47.1	0.43	47.1	0.43
WhiteFish 115kV	127	127.4	0.31	127.4	0.31
WhiteFish 12.5kV	13.3	13.3	0.00	13.3	0.00
Espanola J	127	127.4	0.31	127.4	0.31
Domtar-Narin J	127	127.4	0.31	127.4	0.31
Vermillion J	127	127.4	0.31	127.4	0.31
Martindale TS	127	127.4	0.31	127.4	0.31

**Table 4: Loss of S5M after Connecting MMWFP
Voltage Performance**

Bus Name	Base Case	IMM	%IMM	ULTC	%ULTC
Algoma	123.6	123.7	0.08	123.7	0.08
Manitoulin TS	122.2	122.5	0.25	122.5	0.25
Manitoulin 44kV	46.5	46.5	0.00	46.5	0.00
WhiteFish 115kV	124.1	124.5	0.32	124.5	0.32
WhiteFish 12.5kV	13	13	0.00	13	0.00
Espanola J	123.2	123.5	0.24	123.5	0.24
Domtar-Narin J	123.4	123.7	0.24	123.7	0.24
Vermillion J	124.3	124.7	0.32	124.7	0.32
Martindale TS	126	126.4	0.32	126.4	0.32

**Table 5: Loss of L1S before Connecting MMWFP
Voltage Performance**

Bus Name	Base Case	IMM	%IMM	ULTC	%ULTC
Algoma	123.8	123.9	0.08	123.9	0.08
Manitoulin TS	126.6	127.3	0.55	127.3	0.55
Manitoulin 44kV	46.9	47.1	0.43	47.1	0.43
WhiteFish 115kV	127	127.6	0.47	127.6	0.47
WhiteFish 12.5kV	13.3	13.3	0.00	13.3	0.00
Espanola J	127	127.6	0.47	127.6	0.47
Domtar-Narin J	127	127.6	0.47	127.6	0.47
Vermillion J	127	127.6	0.47	127.6	0.47
Martindale TS	127	127.6	0.47	127.6	0.47

**Table 6: Loss of L1S after Connecting MMWFP
Voltage Performance**

Bus Name	Base Case	IMM	%IMM	ULTC	%ULTC
Algoma	123.6	123.7	0.08	123.7	0.08
Manitoulin TS	122.2	122.5	0.25	122.5	0.25
Manitoulin 44kV	46.5	46.6	0.22	46.6	0.22
WhiteFish 115kV	124.1	124.6	0.40	124.6	0.40
WhiteFish 12.5kV	13	13	0.00	13	0.00
Espanola J	123.2	123.5	0.24	123.5	0.24
Domtar-Narin J	123.4	123.8	0.32	123.8	0.32
Vermillion J	124.3	124.8	0.40	124.8	0.40
Martindale TS	126	126.5	0.40	126.5	0.40

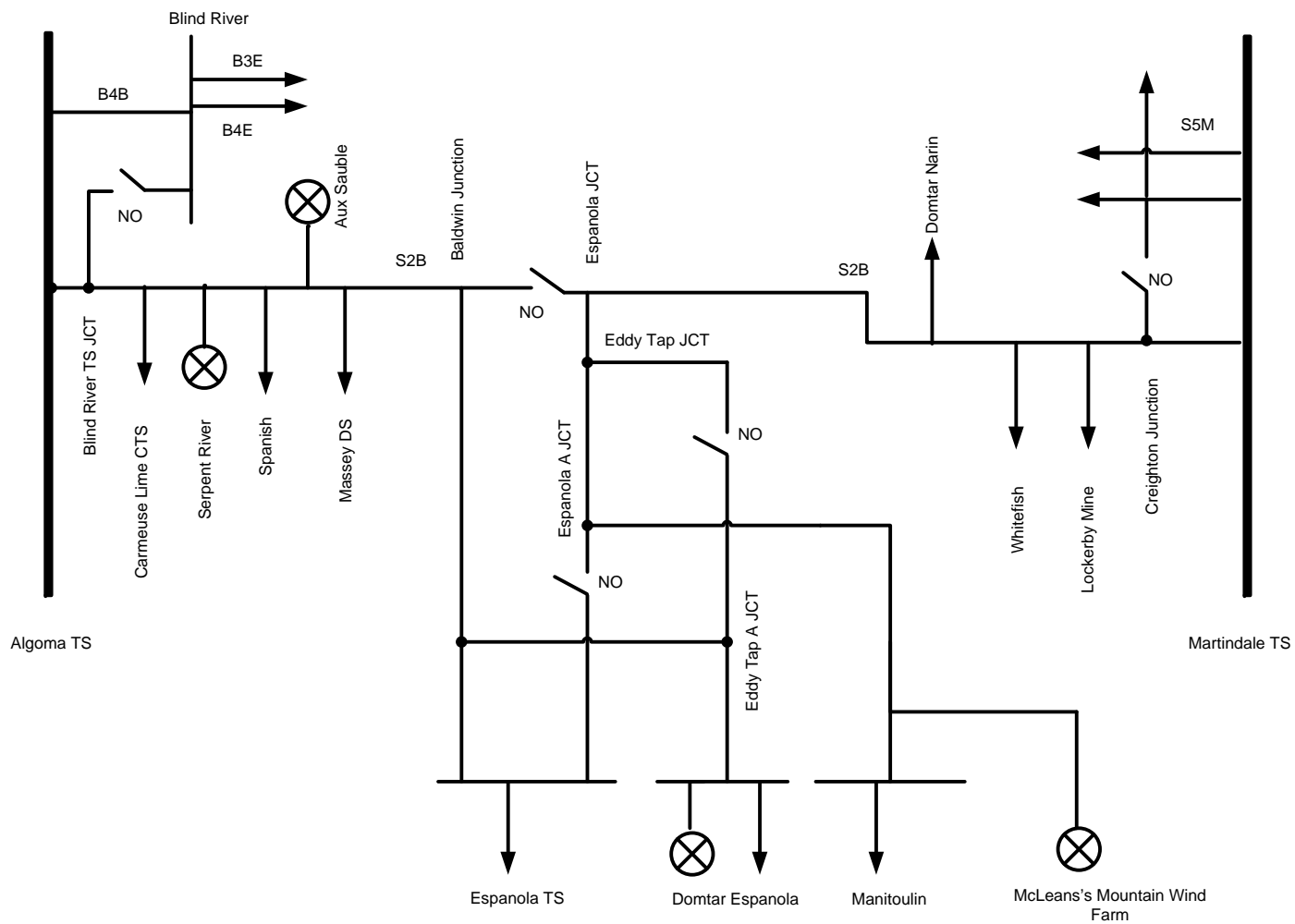


Figure 1: Overview of S2B Configuration

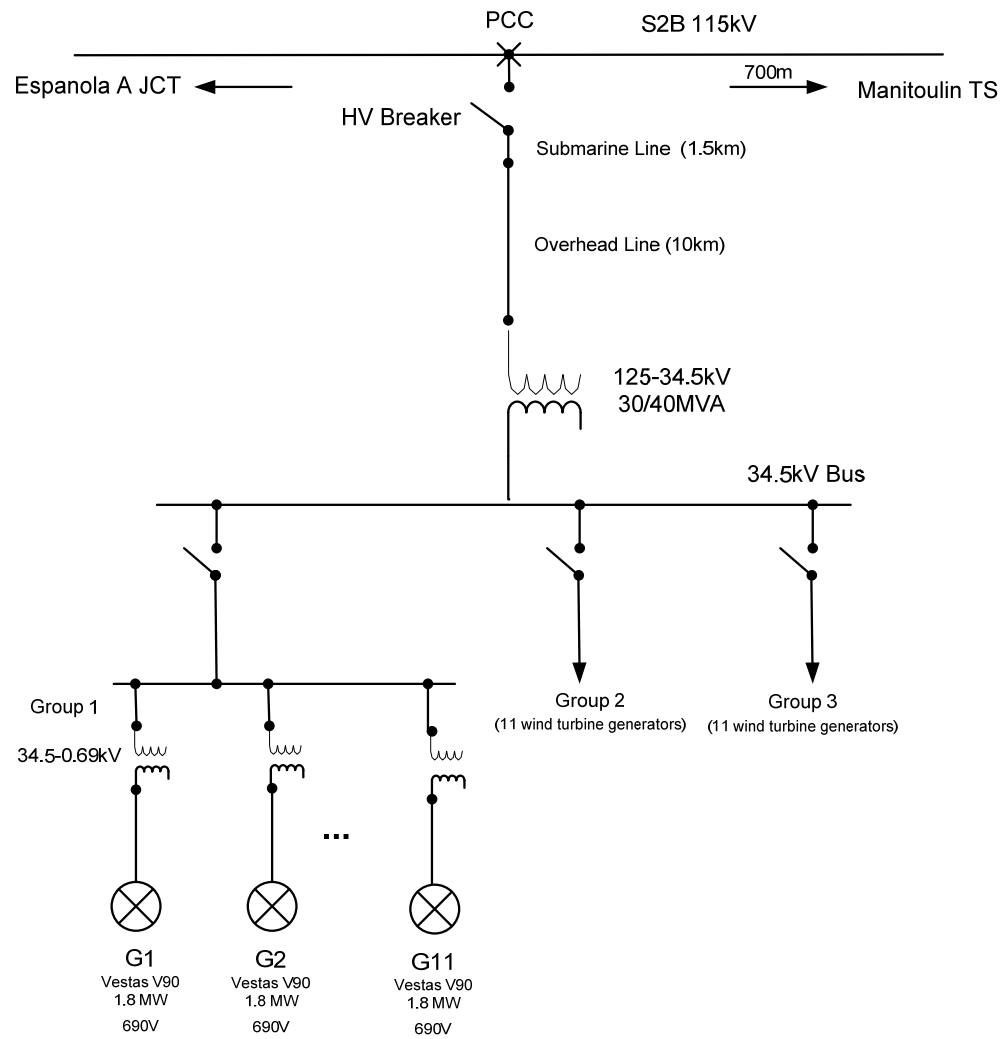


Figure 2: McLean's Mountain Wind Farm Single Line Diagram

UPDATED CONSTRUCTION SCHEDULE

Update - 09-Oct-13

