Jericho Wind, LP

Project Modification Report – Jericho Wind Energy Centre

Report

Environment

Jericho Wind, LP

Project Modification Report – Jericho Wind Energy Centre

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Project Number:

60301207

Date:

July, 2014

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Appendices

Glossary of Terms

Jericho ..... Jericho Wind, LP
NextEra ..... NextEra Energy Canada, LP
REA ..... Renewable Energy Approval
The Project ..... Jericho Wind Energy Centre

1. Introduction

Jericho Wind, LP (Jericho) is constructing a wind energy project in the Municipality of Lambton Shores and the Township of Warwick, in Lambton County, Ontario and in the Municipality of North Middlesex, in Middlesex County, Ontario. The following sections of this Renewable Energy Approval (REA) Project Modification Report describe the proposed modification to this Project and resulting updates to the Construction Plan Report and Project Description Report.

1.1 The Proponent

The Project will be owned and operated by Jericho, a wholly owned subsidiary of NextEra Energy Canada, LP (NextEra). NextEra's indirect parent company is NextEra Energy Resources, LLC. Please note that the REA was reassigned from Jericho Wind, Inc. to Jericho Wind, LP on June 11, 2014 and notice of the change was provided to the Ministry of Environment (MOE) on June 25, 2014.

The primary contacts for the Project are as follows:

Project Proponent	Project Consultant
Ben Greenhouse Director, Development NextEra Energy Canada, LP 390 Bay Street, Suite 1720 Toronto, ON M5H 2Y2 Phone:….1-905-335-4904 Email: .....Jericho.Wind@NextEraEnergy.com Website: ..www.NextEraEnergyCanada.com	Marc Rose Senior Environmental Planner AECOM 105 Commerce Valley Drive West, Floor 7 Markham, ON, Canada L3T 7W3 Phone: .....1-905-747-7793 Email:.....marc.rose@aecom.com

1.2 Project Study Area

The proposed Project is located in the Municipality of Lambton Shores and the Township of Warwick, in Lambton County, Ontario and in the Municipality of North Middlesex, in Middlesex County, Ontario (refer to **Figure 2-1**). The Project Study Area has not changed from the initial REA submission.

The following co-ordinates define the external boundaries of the Project Study Area:

UTM Coordinates

Easting	Northing
420938	4761752
419681	4780912
456597	4777307
453312	4766484

2. Proposed Project Modification

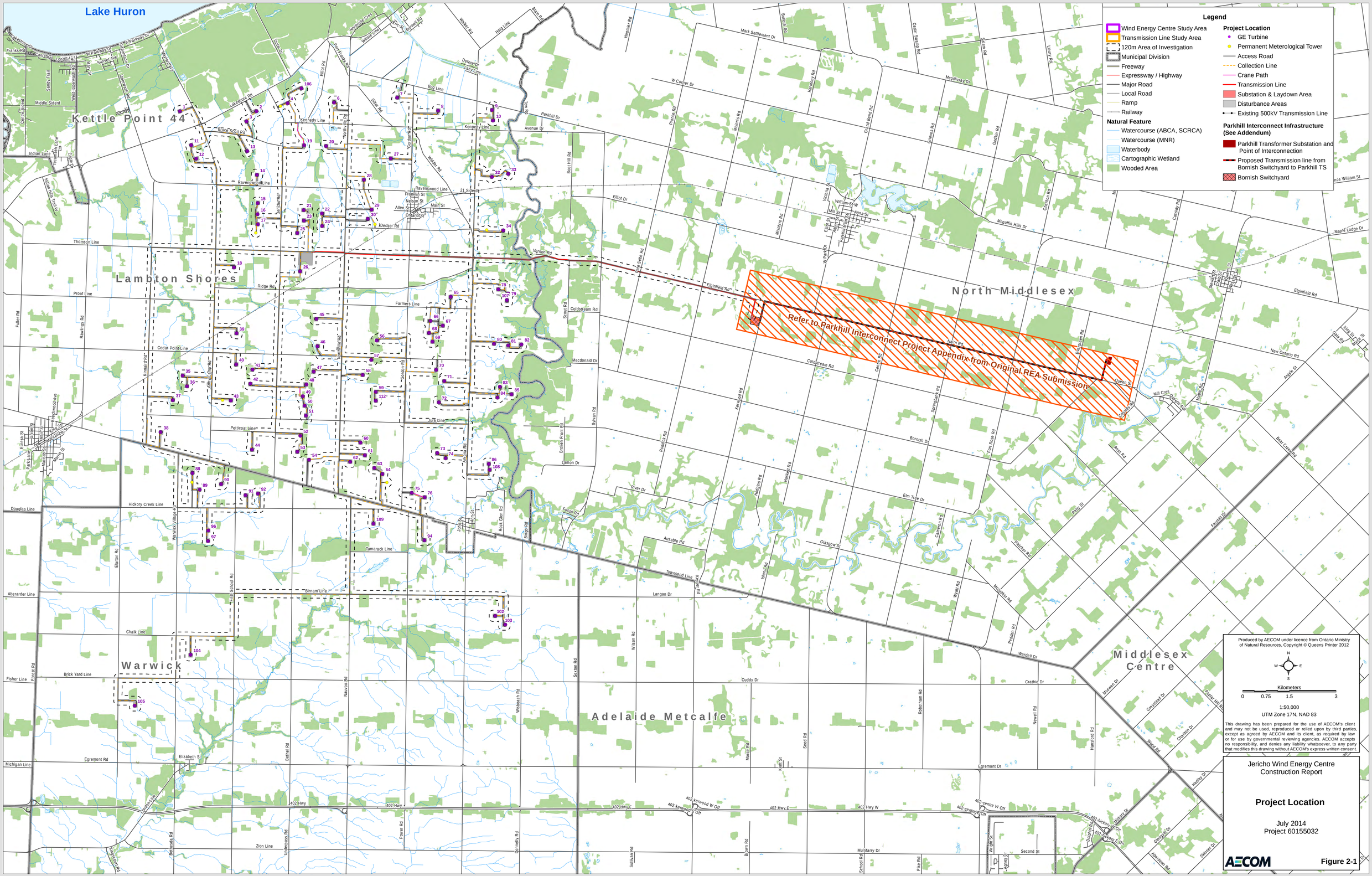
Jericho is proposing to increase the construction dewatering allowance, as outlined in Condition H2 of the REA issued on April 14, 2014, during the excavation and installation of turbine foundations.

The extraction of groundwater for construction dewatering purposes is expected to be of low volume due to the short duration of dewatering activities, and the shallow depth of the turbine bases (up to 4 metres below ground surface). However, there is the potential for water taking above 400,000 L/day to be required depending on the surficial material being excavated, the depth to groundwater, the amount of precipitation received during excavation activities, and other geological characteristics that were observed during the geotechnical investigation.

Based on the analysis of the geotechnical study prepared by AMEC (2013), available geological mapping, MOE water well record borehole logs, and potential precipitation during excavation, Jericho has determined that all turbines proposed for the Project, excluding turbines that have already been constructed, have the potential to require construction dewatering of groundwater greater than 400,000 L/day and surface water up to 1,000,000 L/day during the excavation and installation of turbine foundations. As such the water taking may be classified as Groundwater – Category 3 (taking greater than 400,000 L/day). In all cases, Jericho will only remove the minimum amount of water needed for safe construction practices.

A Hydrogeological Report has been included in **Appendix A** in support of this modification. The report provides background information on the proposed undertaking, the physical setting of the site, and rationale for the change in dewatering requirements. The report also provides a list of the turbines with the potential to require water taking above 400,000 L/day, and the following details about each turbine:

1. The subsurface hydrogeological conditions and estimated zone of influence from water taking activities; and,
2. New potential environmental effects from groundwater drawdown in nearby features and corresponding mitigation measures.



Map Document: (\\GIS\Newtera\GIS\Spatial\MXDs\Report\MXDs\NHA_Mapping\Jericho\60155032_Jericho_REA_Addendum_ProjectLoc_20140715.mxd)

3. Edits to the initial REA Reports

Table 3-1 documents the edits to the initial REA Reports and associated Revision Reports resulting from the modifications described in **Section 2**. The table includes the text from the original REA submission (February, 2013) and the REA revision reports (October, 2013), and edits to the text (underlined text represents additions and strikethrough text represents deletions).

Table 3-1 Edits to the Initial REA Reports

Section / Page in REA Report	Combined REA Report and Revision Report text	Revised Text (Underlined text represents additions and ~~strikethrough text~~ represents deletions.)
Project Description Report		
Table 3-2 / page 26	**Mitigation Strategy** • Limit dewatering where turbines are constructed within the sand and/or gravel deposits to less than 400,000 L/day.	**Mitigation Strategy** ~~• Limit dewatering where turbines are constructed within the sand and/or gravel deposits to less than 400,000 L/day.~~
Table 3-2 / page 25-26	**Monitoring Plan and Contingency Measures** • For significant natural features within the zone of influence and potentially affected by dewatering activities, the following Monitoring Plan will be implemented: ▪ Prior to construction, undertake monthly monitoring for a minimum of six months of surface water levels (staff gauge), stream flow (if applicable), vertical hydraulic gradients (mini-piezometers), surface water temperature and vegetation health of the feature within the identified dewatering zone of influence. ▪ During construction dewatering activities, undertake daily monitoring of surface water levels (staff gauge), stream flow (if applicable), vertical hydraulic gradients (mini-piezometers), surface water temperature and vegetation health of the feature within the identified dewatering zone of influence. ▪ Following construction, undertake monthly monitoring for up to one year of surface water levels (staff gauge), stream flow (if applicable), vertical hydraulic gradients (mini-piezometers), surface water temperature, and vegetation health of the feature within the identified dewatering zone of influence. Monitoring may be terminated prior to one year postconstruction if there is no evidence of residual effects and levels have returned to norms established through pre-construction monitoring. • **Contingency Measures:** ▪ In the event of a decrease in surface water levels which can be attributed to the dewatering activities, stop dewatering until appropriate site-specific mitigation has been implemented. Implement contingency measures (to be determined in consultation with MNR), if required, including but not limited to rescue of stranded wildlife.	**Monitoring Plan and Contingency Measures** • For significant natural features within the zone of influence and potentially affected by dewatering activities, the following Monitoring Plan will be implemented: ~~▪ Prior to construction, undertake monthly monitoring for a minimum of six months of surface water levels (staff gauge), stream flow (if applicable), vertical hydraulic gradients (mini-piezometers), surface water temperature and vegetation health of the feature within the identified dewatering zone of influence.~~ ~~▪ During construction dewatering activities, undertake daily monitoring of surface water levels (staff gauge), stream flow (if applicable), vertical hydraulic gradients (mini-piezometers), surface water temperature and vegetation health of the feature within the identified dewatering zone of influence.~~ ~~▪ Following construction, undertake monthly monitoring for up to one year of surface water levels (staff gauge), stream flow (if applicable), vertical hydraulic gradients (mini-piezometers), surface water temperature, and vegetation health of the feature within the identified dewatering zone of influence. Monitoring may be terminated prior to one year postconstruction if there is no evidence of residual effects and levels have returned to norms established through pre-construction monitoring.~~ ▪ Prior to construction, conduct site reconnaissance visit and record surface water level (if present) prior to construction dewatering. ▪ During Construction, If surface water is present prior to dewatering, monitor surface water levels daily during construction dewatering. ▪ Following construction, undertake monthly monitoring for up to one year of surface water levels of the feature within the identified dewatering zone of influence if a decline is recorded during construction dewatering and the decline is a result of dewatering activities. Monitoring may be terminated prior to one year post-construction if initial monitoring determines that there is no evidence of residual effects and levels have returned to pre-construction condition. • **Contingency Measures:** ▪ In the event of a decrease in surface water levels which can be attributed to the dewatering activities, stop dewatering until appropriate site-specific mitigation has been implemented. ~~Implement contingency measures (to be determined in consultation with MNR), if required, including but not limited to rescue of stranded wildlife.~~ ▪ Implement contingency measures, if required, including but not limited to rescue of stranded wildlife and/or directing dewatering discharge towards the feature after applying appropriate water quality and temperature controls.
Table 3-3 / page 34	**Mitigation Strategy** • Limit dewatering where turbines are constructed within the sand and/or gravel deposits to less than 400,000 L/day.	**Mitigation Strategy** ~~• Limit dewatering where turbines are constructed within the sand and/or gravel deposits to less than 400,000 L/day.~~
Table 3-3 / page 33-34	**Monitoring Plan and Contingency Measures** • For significant natural features within the zone of influence and potentially affected by dewatering activities, the following Monitoring Plan will be implemented: ▪ Prior to construction, undertake monthly monitoring for a minimum of six months of surface water levels (staff gauge), stream flow (if applicable), vertical hydraulic gradients (mini-piezometers), surface water temperature and vegetation health of the feature within the identified dewatering zone of influence. ▪ During construction dewatering activities, undertake daily monitoring of surface water levels (staff gauge), stream flow (if applicable), vertical hydraulic gradients (mini-piezometers), surface water temperature and vegetation health of the feature within the identified dewatering zone of influence. ▪ Following construction, undertake monthly monitoring for up to one year of surface water levels (staff gauge), stream flow (if applicable), vertical hydraulic gradients (mini-piezometers), surface water temperature, and vegetation health of the feature within the identified dewatering zone of influence. Monitoring may be terminated prior to one year postconstruction if there is no evidence of residual effects and levels have returned to norms established through pre-construction monitoring. • **Contingency Measures:** ▪ In the event of a decrease in surface water levels which can be attributed to the dewatering activities, stop dewatering until appropriate site-specific mitigation has been implemented. Implement contingency measures (to be determined in consultation with MNR), if required, including but not limited to rescue of stranded wildlife.	**Monitoring Plan and Contingency Measures** • For ~~significant natural features~~ Turtle Wintering Habitat within the zone of influence and potentially affected by dewatering activities, the following Monitoring Plan will be implemented: ▪ Prior to construction, undertake monthly monitoring for a minimum of six months of surface water levels (staff gauge), stream flow (if applicable), vertical hydraulic gradients (mini-piezometers), surface water temperature and vegetation health of the feature within the identified dewatering zone of influence. ▪ During construction dewatering activities, undertake daily monitoring of surface water levels (staff gauge), stream flow (if applicable), vertical hydraulic gradients (mini-piezometers), surface water temperature and vegetation health of the feature within the identified dewatering zone of influence. ▪ Following construction, undertake monthly monitoring for up to one year of surface water levels (staff gauge), stream flow (if applicable), vertical hydraulic gradients (mini-piezometers), surface water temperature, and vegetation health of the feature within the identified dewatering zone of influence. Monitoring may be terminated prior to one year postconstruction if there is no evidence of residual effects and levels have returned to norms established through pre-construction monitoring. • **Contingency Measures:** ▪ In the event of a decrease in surface water levels which can be attributed to the dewatering activities, stop dewatering until appropriate site-specific mitigation has been implemented. Implement contingency measures (to be determined in consultation with MNR), if required, including but not limited to rescue of stranded wildlife. • For Significant Wetlands and Amphibian Woodland Breeding Habitat within the zone of influence and potentially affected by dewatering activities, the following Monitoring Plan will be implemented: ▪ Prior to construction, conduct site reconnaissance visit and record surface water level (if present) prior to construction dewatering. ▪ During Construction, If surface water is present prior to dewatering, monitor surface water levels daily during construction dewatering. ▪ Following construction, undertake monthly monitoring for up to one year of surface water levels of the feature within the identified dewatering zone of influence if a decline is recorded during construction dewatering and the decline is a result of dewatering activities. Monitoring may be terminated prior to one year post-construction if initial monitoring determines that there is no evidence of residual effects and levels have returned to pre-construction condition.

Table 3-1 Edits to the Initial REA Reports

Section / Page in REA Report	Combined REA Report and Revision Report text	Revised Text (Underlined text represents additions and ~~strikethrough text~~ represents deletions.)
		• **Contingency Measures:** ▪ In the event of a decrease in surface water levels which can be attributed to the dewatering activities, stop dewatering until appropriate site-specific mitigation has been implemented. ▪ Implement contingency measures, if required, including but not limited to rescue of stranded wildlife and/or directing dewatering discharge towards the feature after applying appropriate water quality and temperature controls.
Table 3-4 / page 49	**Monitoring Plan and Contingency Measures** • Conduct 3 years post-construction amphibian call surveys (frogs and toads) and egg mass or adult surveys (salamanders) to assess any potential changes in amphibian breeding populations or species distribution (if features determined to be significant) at features potentially affected by construction dewatering (AWO-01, AWO-08, AWO-13, AWO-17, AWO-20 and AMC-01) by a qualified Biologist, using the protocol described above.	**Monitoring Plan and Contingency Measures** • Conduct 3 years post-construction amphibian call surveys (frogs and toads) and egg mass or adult surveys (salamanders) to assess any potential changes in amphibian breeding populations or species distribution (if features determined to be significant) at features potentially affected by construction dewatering (AWO-01, AWO-03, AWO-05, AWO-08, AWO-13, AWO-17, AWO-20 and AMC-01) by a qualified Biologist, using the protocol described above.
Table 3-5 / page 51	**Mitigation Strategy** • Limit dewatering where turbines are constructed within the sand and/or gravel deposits to less than 400,000 L/day.	**Mitigation Strategy** ~~• Limit dewatering where turbines are constructed within the sand and/or gravel deposits to less than 400,000 L/day.~~
Table 3-7 / page 58	**Mitigation Strategy** • Limit dewatering where turbines are constructed within the sand and/or gravel deposits or where shallow water table conditions are expected to be less than 400,000 L/day (Anticipated turbines: 8, 25, and 32-34). **Contingency Measures** If surface water levels are temporarily affected from construction dewatering activities, divert water from dewatering activities following appropriate water quality and water temperature controls (i.e. filter bags and/or envirotanks, discharge locations, etc.) to the surface water feature to supplement flow and or surface water levels.	**Mitigation Strategy** • Limit dewatering at all turbines to quantities detailed in Table 4 of the *Hydrogeological Report in Support of a Modification to the Renewable Energy Approval for the Jericho Wind Energy Centre*, prepared by AECOM in July 2014.~~where turbines are constructed within the sand and/or gravel deposits or where shallow water table conditions are expected to be less than 400,000 L/day (Anticipated turbines: 8, 25, and 32-34)~~. • Avoid dewatering turbines with intersecting radii of influence simultaneously, where possible. • Set back groundwater discharge locations at least 30 m from significant wetlands. All groundwater discharge will undergo appropriate water quality and temperature controls, as required, and will be directed through a sediment filter (i.e., filter bag), sediment basin or other appropriate device capable of handling the anticipated volumes of water before being discharged to the environment. The specific locations for directing treated groundwater discharge will be selected in the field at the time of construction, but will generally be limited to grassed areas, existing drainage ditching or agricultural fields. **Contingency Measures** If surface water levels are temporarily affected from construction dewatering activities, ~~divert water from dewatering activities following appropriate water quality and water temperature controls (i.e. filter bags and/or envirotanks, discharge locations, etc.) to the surface water feature to supplement flow and or surface water levels.~~ stop dewatering until appropriate site specific mitigation plan has been developed.
Construction Plan Report		
Table 3-3 / page 25	**Mitigation Strategy** • Limit dewatering where turbines are constructed within the sand and/or gravel deposits to less than 400,000 L/day.	**Mitigation Strategy** ~~• Limit dewatering where turbines are constructed within the sand and/or gravel deposits to less than 400,000 L/day.~~
Table 3-3 / page 24-25	**Monitoring Plan and Contingency Measures** • For significant natural features within the zone of influence and potentially affected by dewatering activities, the following Monitoring Plan will be implemented: ▪ Prior to construction, undertake monthly monitoring for a minimum of six months of surface water levels (staff gauge), stream flow (if applicable), vertical hydraulic gradients (mini-piezometers), surface water temperature and vegetation health of the feature within the identified dewatering zone of influence. ▪ During construction dewatering activities, undertake daily monitoring of surface water levels (staff gauge), stream flow (if applicable), vertical hydraulic gradients (mini-piezometers), surface water temperature and vegetation health of the feature within the identified dewatering zone of influence. ▪ Following construction, undertake monthly monitoring for up to one year of surface water levels (staff gauge), stream flow (if applicable), vertical hydraulic gradients (mini-piezometers), surface water temperature, and vegetation health of the feature within the identified dewatering zone of influence. Monitoring may be terminated prior to one year postconstruction if there is no evidence of residual effects and levels have returned to norms established through pre-construction monitoring. • **Contingency Measures:** ▪ In the event of a decrease in surface water levels which can be attributed to the dewatering activities, stop dewatering until appropriate site-specific mitigation has been implemented. Implement contingency measures (to be determined in consultation with MNR), if required, including but not limited to rescue of stranded wildlife.	**Monitoring Plan and Contingency Measures** • For significant natural features within the zone of influence and potentially affected by dewatering activities, the following Monitoring Plan will be implemented: ~~▪ Prior to construction, undertake monthly monitoring for a minimum of six months of surface water levels (staff gauge), stream flow (if applicable), vertical hydraulic gradients (mini-piezometers), surface water temperature and vegetation health of the feature within the identified dewatering zone of influence.~~ ~~▪ During construction dewatering activities, undertake daily monitoring of surface water levels (staff gauge), stream flow (if applicable), vertical hydraulic gradients (mini-piezometers), surface water temperature and vegetation health of the feature within the identified dewatering zone of influence.~~ ~~▪ Following construction, undertake monthly monitoring for up to one year of surface water levels (staff gauge), stream flow (if applicable), vertical hydraulic gradients (mini-piezometers), surface water temperature, and vegetation health of the feature within the identified dewatering zone of influence. Monitoring may be terminated prior to one year postconstruction if there is no evidence of residual effects and levels have returned to norms established through pre-construction monitoring.~~ ▪ Prior to construction, conduct site reconnaissance visit and record surface water level (if present) prior to construction dewatering. ▪ During Construction, If surface water is present prior to dewatering, monitor surface water levels daily during construction dewatering. ▪ Following construction, undertake monthly monitoring for up to one year of surface water levels of the feature within the identified dewatering zone of influence if a decline is recorded during construction dewatering and the decline is a result of dewatering activities. Monitoring may be terminated prior to one year post-construction if initial monitoring determines that there is no evidence of residual effects and levels have returned to pre-construction condition. • **Contingency Measures:** ▪ In the event of a decrease in surface water levels which can be attributed to the dewatering activities, stop dewatering until appropriate site-specific mitigation has been implemented.~~Implement contingency measures (to be determined in consultation with MNR), if required, including but not limited to rescue of stranded wildlife.~~ ▪ Implement contingency measures, if required, including but not limited to rescue of stranded wildlife and/or directing dewatering discharge towards the feature after applying appropriate water quality and temperature controls.

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Table 3-4 / page 33	**Mitigation Strategy** • Limit dewatering where turbines are constructed within the sand and/or gravel deposits to less than 400,000 L/day.	**Mitigation Strategy** ~~• Limit dewatering where turbines are constructed within the sand and/or gravel deposits to less than 400,000 L/day.~~
Table 3-4 / page 32-33	**Monitoring Plan and Contingency Measures** • For significant natural features within the zone of influence and potentially affected by dewatering activities, the following Monitoring Plan will be implemented: ▪ Prior to construction, undertake monthly monitoring for a minimum of six months of surface water levels (staff gauge), stream flow (if applicable), vertical hydraulic gradients (mini-piezometers), surface water temperature and vegetation health of the feature within the identified dewatering zone of influence. ▪ During construction dewatering activities, undertake daily monitoring of surface water levels (staff gauge), stream flow (if applicable), vertical hydraulic gradients (mini-piezometers), surface water temperature and vegetation health of the feature within the identified dewatering zone of influence. ▪ Following construction, undertake monthly monitoring for up to one year of surface water levels (staff gauge), stream flow (if applicable), vertical hydraulic gradients (mini-piezometers), surface water temperature, and vegetation health of the feature within the identified dewatering zone of influence. Monitoring may be terminated prior to one year postconstruction if there is no evidence of residual effects and levels have returned to norms established through pre-construction monitoring. • **Contingency Measures:** ▪ In the event of a decrease in surface water levels which can be attributed to the dewatering activities, stop dewatering until appropriate site-specific mitigation has been implemented. Implement contingency measures (to be determined in consultation with MNR), if required, including but not limited to rescue of stranded wildlife.	**Monitoring Plan and Contingency Measures** • For ~~significant natural features~~ Turtle Wintering Habitat within the zone of influence and potentially affected by dewatering activities, the following Monitoring Plan will be implemented: ▪ Prior to construction, undertake monthly monitoring for a minimum of six months of surface water levels (staff gauge), stream flow (if applicable), vertical hydraulic gradients (mini-piezometers), surface water temperature and vegetation health of the feature within the identified dewatering zone of influence. ▪ During construction dewatering activities, undertake daily monitoring of surface water levels (staff gauge), stream flow (if applicable), vertical hydraulic gradients (mini-piezometers), surface water temperature and vegetation health of the feature within the identified dewatering zone of influence. ▪ Following construction, undertake monthly monitoring for up to one year of surface water levels (staff gauge), stream flow (if applicable), vertical hydraulic gradients (mini-piezometers), surface water temperature, and vegetation health of the feature within the identified dewatering zone of influence. Monitoring may be terminated prior to one year postconstruction if there is no evidence of residual effects and levels have returned to norms established through pre-construction monitoring. • **Contingency Measures:** ▪ In the event of a decrease in surface water levels which can be attributed to the dewatering activities, stop dewatering until appropriate site-specific mitigation has been implemented. Implement contingency measures (to be determined in consultation with MNR), if required, including but not limited to rescue of stranded wildlife. • For Significant Wetlands and Amphibian Woodland Breeding Habitat within the zone of influence and potentially affected by dewatering activities, the following Monitoring Plan will be implemented: ▪ Prior to construction, conduct site reconnaissance visit and record surface water level (if present) prior to construction dewatering. ▪ During Construction, If surface water is present prior to dewatering, monitor surface water levels daily during construction dewatering. ▪ Following construction, undertake monthly monitoring for up to one year of surface water levels of the feature within the identified dewatering zone of influence if a decline is recorded during construction dewatering and the decline is a result of dewatering activities. Monitoring may be terminated prior to one year post-construction if initial monitoring determines that there is no evidence of residual effects and levels have returned to pre-construction condition. • **Contingency Measures:** ▪ In the event of a decrease in surface water levels which can be attributed to the dewatering activities, stop dewatering until appropriate site-specific mitigation has been implemented. ▪ Implement contingency measures, if required, including but not limited to rescue of stranded wildlife and/or directing dewatering discharge towards the feature after applying appropriate water quality and temperature controls.
Table 3-5 / page 41	**Mitigation Strategy** • Limit dewatering where turbines are constructed within the sand and/or gravel deposits to less than 400,000 L/day.	**Mitigation Strategy** ~~• Limit dewatering where turbines are constructed within the sand and/or gravel deposits to less than 400,000 L/day.~~
Section 3.3.2 / page 49	The extraction of groundwater for construction dewatering purposes is expected to be of low volume due to the short duration of dewatering activities, and the shallow depth of the turbine bases and collection lines (up to 4 mbgs and 2 mbgs respectively). However, there is the potential that water taking could be greater than 50,000 L/day, depending on the surficial material being excavated, the depth to groundwater, the amount of precipitation received during excavation activities, and other geological characteristics that were observed during the geotechnical investigation. The following turbines have been determined, through the analysis of the geotechnical study prepared by AMEC (2013), available geological mapping and MOE water well record borehole logs, to have the potential to require construction dewatering of greater than 50,000 L/day during the excavation and installation of turbine foundations: 8, 25, and 32-34. The location and extent of construction dewatering associated with collection line installation varies depending on surficial geological material encountered, the depth to groundwater as indicated in MOE water well records and the presence of groundwater indicators observed during field investigations. All dewatering activities associated with turbine foundations and collection lines are anticipated to be less than 400,000 L/day. As such the water taking may be classified as Groundwater – Category 2 (short-term, non-recurring taking less than 30 consecutive days and less than 400,000 L/day). Appendix B-1 contains detailed calculations on the dewatering estimates and radii of influence for the construction dewatering associated with turbine foundations. Based on the calculations in Appendix B-1, the conservative water taking per turbine base excavation range from 95,860 L/day to 214,400 L/day with calculated radii of influence for the construction dewatering ~~of~~ ranging between 131 m and 278 m. Appendix B-2 contains detailed calculations of the dewatering estimates and radius of influence for the construction dewatering associated with collection line installation. Based on the calculations in Appendix B-2, the conservative water taking for collection lines installed in permeable surficial material is approximately 174,300 L/day with a calculated radius of influence of 77 m. As these calculations are based on estimations from the available data, at least one geotechnical borehole will be drilled for each turbine base location and these calculations will be revisited using the new soil data and depth to groundwater found from the geotechnical investigations.	The extraction of groundwater for construction dewatering purposes is expected to be of low volume due to the short duration of dewatering activities, and the shallow depth of the turbine bases and collection lines (up to 4 mbgs and 2 mbgs respectively). However, there is the potential ~~that~~ for water taking ~~could be greater than 50,000~~ above 400,000 L/day to be required, depending on the surficial material being excavated, the depth to groundwater, the amount of precipitation received during excavation activities, and other geological characteristics that were observed during the geotechnical investigation. ~~The following turbines have been determined, through the analysis of the geotechnical study prepared by AMEC (2013), available geological mapping and MOE water well record borehole logs, to have the potential to require construction dewatering of greater than 50,000 L/day during the excavation and installation of turbine foundations: 8, 25, and 32-34.~~ Based the analysis of the geotechnical study prepared by AMEC (2013), available geological mapping, MOE water well record borehole logs, and potential precipitation during excavation, Jericho has determined that all turbines proposed for the Project, excluding turbines that have already been constructed, have the potential to require construction dewatering greater than 400,000 L/day during the excavation and installation of turbine foundations. The location and extent of construction dewatering associated with collection line installation varies depending on surficial geological material encountered, the depth to groundwater as indicated in MOE water well records and the presence of groundwater indicators observed during field investigations. All dewatering activities associated ~~with turbine foundations and~~ collection lines are anticipated to be less than 400,000 L/day. As such the water taking for turbine foundations may be classified as Groundwater – Category ~~2~~ 3 (~~short-term, non-recurring taking less than 30 consecutive days and less than 400,000 L/day~~ taking greater than 400,000 L/day). In all cases, Jericho will only remove the minimum amount of water needed for safe construction practices. ~~Appendix B-1~~ The *Hydrogeological Report in Support of a Modification to the Renewable Energy Approval for the Jericho Wind Energy Centre* (Hydrogeological Report), prepared by AECOM in July 2014 contains detailed calculations on the dewatering estimates and radii of influence for the construction dewatering associated with turbine foundations. Based on the calculations in ~~Appendix B-1~~ the report, the conservative water taking of groundwater per turbine base excavation range from ~~95,860~~ 50,000 L/day to ~~214,400~~ 1,244,506 L/day with calculated radii of influence for the construction dewatering ~~of~~ ranging between ~~131~~ 65.97 m and ~~278~~ 214.88 m. Appendix B-2 contains detailed calculations of the dewatering estimates and radius of influence for the construction dewatering associated with collection line installation. Based on the calculations in Appendix B-2, the conservative water taking for collection lines installed in permeable surficial material is approximately 174,300 L/day with a calculated radius of influence of 77 m. ~~As these calculations are based on estimations from the available data, at least one geotechnical borehole will be drilled for each turbine base location and these calculations will be revisited using the new soil data and depth to groundwater found from the geotechnical investigations.~~

Table 3-1 Edits to the Initial REA Reports

Section / Page in REA Report	Combined REA Report and Revision Report text	Revised Text (Underlined text represents additions and ~~strikethrough text~~ represents deletions.)
Table 3-6 / page 49	**Mitigation Strategy** • Limit dewatering where turbines are constructed within the sand and/or gravel deposits or where shallow water table conditions are expected to be less than 400,000 L/day (Anticipated turbines: 8, 25, and 32-34). **Contingency Measures** If surface water levels are temporarily affected from construction dewatering activities, divert water from dewatering activities following appropriate water quality and water temperature controls (i.e. filter bags and/or envirotanks, discharge locations, etc.) to the surface water feature to supplement flow and or surface water levels.	**Mitigation Strategy** • Limit dewatering <u>at all turbines to quantities detailed in Table 4 of the *Hydrogeological Report in Support of a Modification to the Renewable Energy Approval for the Jericho Wind Energy Centre,* prepared by AECOM in July 2014.</u>~~where turbines are constructed within the sand and/or gravel deposits or where shallow water table conditions are expected to be less than 400,000 L/day (Anticipated turbines: 8, 25, and 32-34)~~. <u>• Avoid dewatering turbines with intersecting radii of influence simultaneously, where possible.</u> <u>• Set back groundwater discharge locations at least 30 m from significant wetlands. All groundwater discharge will undergo appropriate water quality and temperature controls, as required, and will be directed through a sediment filter (i.e., filter bag), sediment basin or other appropriate device capable of handling the anticipated volumes of water, before being discharged to the environment. The specific locations for directing treated groundwater discharge will be selected in the field at the time of construction, but will generally be limited to grassed areas, existing drainage ditching or agricultural fields.</u> **Contingency Measures** If surface water levels are temporarily affected from construction dewatering activities, ~~divert water from dewatering activities following appropriate water quality and water temperature controls (i.e. filter bags and/or envirotanks, discharge locations, etc.) to the surface water feature to supplement flow and or surface water levels.~~ <u>stop dewatering until appropriate site specific mitigation plan has been developed</u>.
Design and Operations Report		
Table 6-2 / page 28	**Monitoring Plan and Contingency Measures** • Conduct 3 years post-construction amphibian call surveys (frogs and toads) and egg mass or adult surveys (salamanders) to assess any potential changes in amphibian breeding populations or species distribution (if features determined to be significant) at features potentially affected by construction dewatering (AWO-01, AWO-08, AWO-13, AWO-17, AWO-20 and AMC-01) by a qualified Biologist, using the protocol described above.	**Monitoring Plan and Contingency Measures** • Conduct 3 years post-construction amphibian call surveys (frogs and toads) and egg mass or adult surveys (salamanders) to assess any potential changes in amphibian breeding populations or species distribution (if features determined to be significant) at features potentially affected by construction dewatering (AWO-01, <u>AWO-03, AWO-05,</u> AWO-08, AWO-13, AWO-17, AWO-20 and AMC-01) by a qualified Biologist, using the protocol described above.
Water Assessment and Water Body Report		
Section 5.3 / page 250	**Dewatering Activities (if necessary)** • Limit dewatering where turbines are constructed within the sand and/or gravel deposits to less than 400,000 L/day.	**Dewatering Activities (if necessary)** ~~• Limit dewatering where turbines are constructed within the sand and/or gravel deposits to less than 400,000 L/day.~~
Table 5-8 / page 263	**Mitigation Strategy (Refer to Section 5.3 for Mitigation Measures)** • Limit dewatering where turbines are constructed within the sand and/or gravel deposits to less than 400,000 L/day.	~~• Limit dewatering where turbines are constructed within the sand and/or gravel deposits to less than 400,000 L/day.~~
Decommissioning Plan Report		
There are no edits to the Decommissioning Plan Report resulting from the modifications described in **Section 2.**		
Wind Turbine Specification Report		
There are no edits to the Wind Turbine Specification Report resulting from the modifications described in **Section 2.**		

4. Summary and Conclusions

The Project modification described in this REA Project Modification Report do not change the overall conclusion of the Project Description Report (February, 2013) and associated Revision to the Project Description Report (October, 2013) which state that “this project can be constructed, installed and operated without any significant adverse residual effects to the environment. Post-construction monitoring related to effects on wildlife, including birds and bats, will be undertaken to confirm this conclusion”.

Appendix A

Hydrogeological Report in Support of a Modification to the Renewable Energy Approval for the Jericho Wind Energy Centre

Jericho Wind, Inc.

Hydrogeological Report in Support of a Modification to the Renewable Energy Approval for the Jericho Wind Energy Centre

Report

Environment

Jericho Wind, LP.

Hydrogeological Report in Support of a Modification to the Renewable Energy Approval for the Jericho Wind Energy Centre

Prepared by:

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Project Number:

60301207

Date:

July, 2014

Statement of Qualifications and Limitations

The attached Report (the "Report") has been prepared by AECOM Canada Ltd. ("Consultant") for the benefit of the client ("Client") in accordance with the agreement between Consultant and Client, including the scope of work detailed therein (the "Agreement").

The information, data, recommendations and conclusions contained in the Report (collectively, the "Information"):

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- represents Consultant's professional judgement in light of the Limitations and industry standards for the preparation of similar reports;
- may be based on information provided to Consultant which has not been independently verified;
- has not been updated since the date of issuance of the Report and its accuracy is limited to the time period and circumstances in which it was collected, processed, made or issued;
- must be read as a whole and sections thereof should not be read out of such context;
- was prepared for the specific purposes described in the Report and the Agreement; and
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July 22, 2014

Mr. Ben Greenhouse
NextEra Energy Resource, LLC
700 Universe Blvd.
Juno Beach, FL 33408

Dear Mr. Greenhouse:

Project No: 60301207

Regarding: Hydrogeological Report in Support of a Modification to the Renewable Energy Approval for the Jericho Wind Energy Centre

The purpose of this letter is to provide additional hydrogeological information and discussion in support of a modification to Condition H1 and H2 of the REA approval for the Jericho Wind Energy Centre for construction related dewatering activities associated with turbine foundation construction.

On behalf of Jericho Wind, LP., AECOM is pleased to submit the following Hydrogeological Assessment. The attached report provides background information on the proposed undertaking, the physical setting of the site, subsurface hydrogeological conditions, an assessment of potential impacts of construction dewatering and discharge of water to the environment, and a monitoring plan and mitigation measures to address potential impacts.

Should you or any technical reviewer have any questions regarding this submission, please contact the undersigned at 905-747-7793 or Marie Wardman at 905-747-7598.

Sincerely,
AECOM Canada Ltd.

Marc Rose, MES, MCIP, RPP
Senior Environmental Planner
Marc.Rose@aecom.com

MR:mm
Attach

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	YES	Jericho Wind, LP
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3		Ministry of the Environment

AECOM Signatures

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