CONESTOGO WIND, LP

Conestogo Wind Farm

Revised Environmental Impact Assessment Report

October 12, 2011

GENIVAR

Project No. MA-09-213-00

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1. Environmental Impact Assessment

The purpose of this report is to provide a summary of the results of the formal impact assessments and evaluation of significance completed in the *Records Review and Natural Heritage Evaluation* (Appendix B). Detailed information can be located in this report.

Turbines 4, 7 and 9 are proposed to be located within 120 m of a significant natural feature. The results of the Environmental Impact Assessment is presented in Section 1.1. Turbines 1, 4 and 8 are located within 120 m, but not closer than 30 m from a reported watercourse and the results of these Environmental Impact Assessments are presented in Section 1.2.

1.1 Significant Woodlots, Wetlands and Wildlife Habitat

A detailed analysis of the woodlots within 300 m of the Conestogo Wind Energy Centre Project Location is presented in the Natural Heritage Screening Report Addendum found in Appendix B. Two woodlots within 120 m of project components were determined to be “significant” and these are identified as ELC Units 4 and 8 as shown in Figure 1 of the *Records Review and Natural Heritage Evaluation* (Appendix B).

Two other natural features were identified as either having significant wildlife habitat or the potential for significant wildlife habitat. These include: one willow deciduous wetland unit, ELC Unit 9, which has the potential for woodland amphibian breeding; and one meadow marsh, ELC Unit 12, which is potential habitat for the Monarch Butterfly. A summary of the EIS is presented in Table 1 below.

1.2 Water Impact Analysis

A detailed analysis of the watercourses in the Conestogo Wind Energy Centre Study Area is presented in The Water Report, found in Appendix G. A summary of the EIS is presented in Table 2 below. Specific protocols and procedures for erosion and sediment control will be developed in conjunction with the Grand River Conservation Authority as a part of their permitting process; however sample plans are presented below.

1.2.1 Sample Erosion and Sediment Control Plan

Erosion and Sediment Control is used to prevent the release of sediment from construction works within or adjacent to sensitive environmental features, and/or to contain sediments within the work area. In order for these mitigations to be effective, it is imperative they are installed correctly in the proper location, inspected, and repaired when necessary. This outcome is achieved through proper coordination by individuals involved in the planning and implementation of these mitigations.

The following is a list of measures for controlling the release of sediments during construction:

- Light Duty Sediment Fence – a sediment fence will be placed at the edge of the work area to prevent sediments from reaching the water feature. Filter fabric is the only acceptable fencing material to be used (i.e. no plastic-braided fencing). Fencing shall be secured along the base by digging in the filter fabric and backfilling with earth to grade, to prevent runoff from flowing underneath the bottom edge. In the area where the work area drains overland flow towards the watercourse, the fencing will be doubled with a row of hay bales installed between the fencing and on the upstream side. The hay bales will be installed in a shallow (~5 cm) trench packed tightly together and staked into position.
- Sediment fencing shall be placed along the base of all spoil piles to prevent sediment-laden runoff from entering ditches or watercourses.
- Rock check dams and/or hay bales should be installed in project-affected drainage ditches to entrap sediments and reduce water velocities to facilitate sediment deposition. Rock check dams will be installed via a standard sediment fence installed perpendicular to the flow and then filled with fine gravel or filter sand on either side. Alternatively, double sediment fencing and the associated hay bales may be installed to achieve the same result; however additional staking may be required to prevent hay bales from floating in the associated deeper waters.

Installation locations and specifications will depend on the nature of the crossing and it's the respective site specific conditions, and may not be warranted at certain locations.

1.2.2 Directional Drilling Procedures

Directional drilling will be used to install an underground electrical cable between turbines 8 and 3. This method of installation has been selected in order to minimize impacts and risks to the water course. The directional drilling operations will be conducted in accordance with the Department of Fisheries and Oceans Canada *Operational Statement: High-Pressure Directional Drilling,Version 3.0*. A drawing showing the layout and proposed path of the directional drill has been include in Appendix I of this report. The following section provides measures to protect fish and fish habitat during directional drilling:

1. Existing roads and/or trails will be used to move equipment in order to avoid disturbing riparian vegetation;
2. The drill path will be an appropriate depth (minimum 1 m below stream bed) in order to minimize the risk of "fracing out" and to prevent the cable from being exposed from natural scouring of the stream bed;
3. Machinery will cross the creek via Side Road 17 and will not ford the water course;
4. The proposed entry and exit work areas will be above the ordinary high water mark;
5. Entry and exit pits will be of sufficient size to contain drilling mud and prevent sediment from entering the creek.

In addition to the preventative measures, the contractor will be required to develop an Emergency Frac-out Response and Contingency Plan containing (as a minimum) the following items:

1) Material and equipment needed to contain and clean up drilling mud release must be kept onsite at all times when drilling is in progress;
2) Implement a response plan containing:
   a) Measures to stop work;
   b) Measures to contain drilling mud;
   c) Notification of the DFO and GRCA;
   d) Priority actions to clean up impacts in order of greatest risk; and
   e) Measures to ensure the cleanup do not result in greater damage than leaving the mud in place
3) A contingency crossing plan to re-drill and a suitable alternate location;
4) Stabilization measures for waste materials which may include either biodegradable mats or the planting of native grasses or shrubs; and
5) Measures to maintain sediment and erosion control until any disturbed areas can be re-vegetated.

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Table 1: EIS Summary for Woodlots and Wetlands

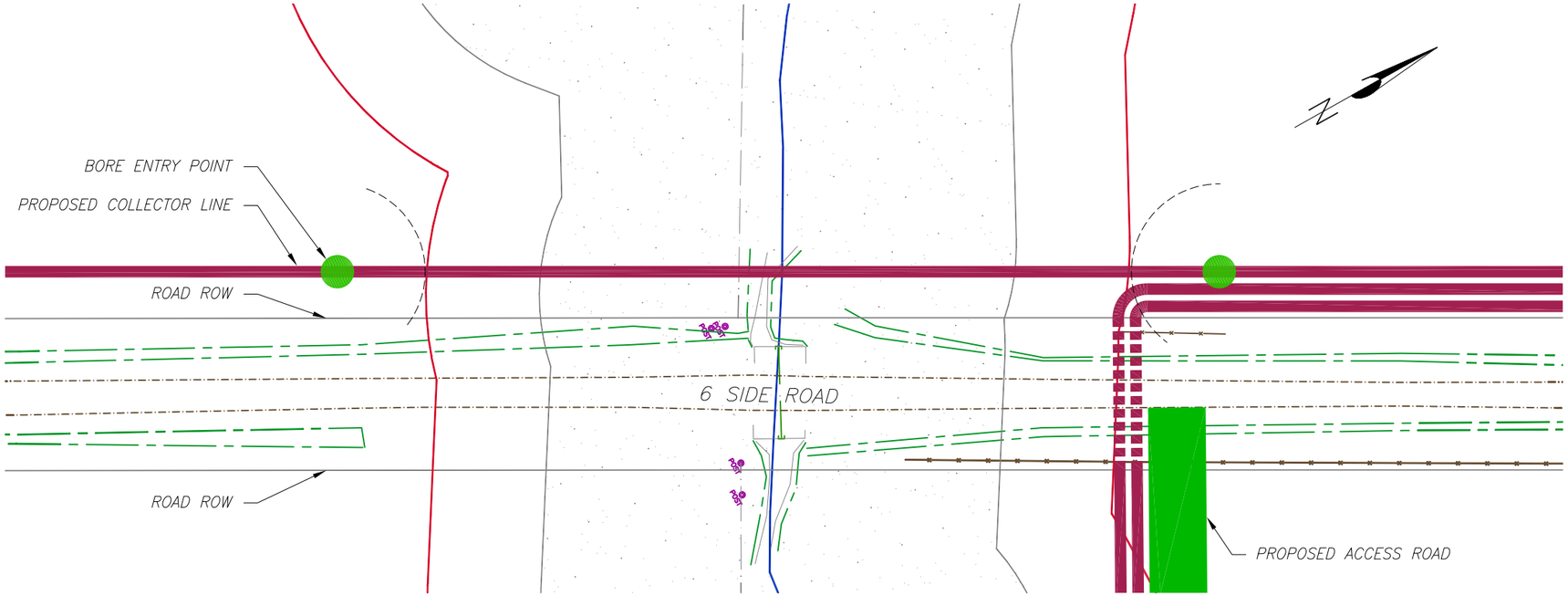
Project Component	Distance to Feature	Description of Feature	Potential Environmental Impacts	Mitigation Measures	Monitoring Requirements
Turbine 4	Turbine 6 = 78 m	ELC 12: Timothy and reed canary grass dominate the valley system. Occasional scattered shrubs of buckthorn and hawthorn occur throughout.	Vegetation: None as no clearing is required. Wildlife: Possible disturbance of wildlife during construction. Possible incidental kill of insects during operation.	○ Construction area to be clearly marked and staked to reduce footprint impacts ○ Sediment control, light duty sedimentation fencing with hay bales where drainage is towards creek. ○ Minimize riparian vegetation loss	○ Regular inspection of sedimentation fencing during construction
Underground electrical line running from turbine 8 to turbine 9	64 m	ELC 12: Timothy and reed canary grass dominate the valley system. Occasional scattered shrubs of buckthorn and hawthorn occur throughout.	Vegetation: None as no native vegetation clearing is required. Wildlife: Possible disturbance of wildlife during construction.	○ Construction area to be clearly marked and staked to reduce footprint impacts ○ Sediment control, light duty sedimentation fencing with hay bales where drainage is towards creek.	○ Routine inspection of erosion control devices to ensure no sedimentation impacts on water bodies ○ Inspection of final restored surfaces to ensure vegetation re-growth to minimize erosion
Turbine 7	Turbine 7 = 76 m	ELC 8: White ash deciduous forest linked to a meadow marsh community by a watercourse.	Vegetation: None as no clearing is required. Wildlife: Possible disturbance of amphibians during construction. Possible incidental kill of birds or bats during operation. Hydrological: Sedimentation, disruption of hydrological function.	○ Construction area to be clearly marked and staked to reduce footprint impacts ○ Light duty sedimentation fencing installed around work area during construction ○ Ensure hydrological regime of woodlot is not disturbed ○ Limit construction to outside of sensitive timing windows for birds and amphibians	○ Formal Bird and Bat monitoring program during first 3 years of operation ○ On-going reporting of bird/bat deaths by site staff
Access road for turbines 7 and 8		ELC 8: White ash deciduous forest linked to a meadow marsh community by a watercourse.	Vegetation: None as no clearing is required. Wildlife: Possible disturbance of amphibians during construction. Hydrological: Sedimentation, disruption of hydrological function.	○ Construction area to be clearly marked and staked to reduce footprint impacts ○ Light duty sedimentation fencing installed around work area during construction ○ Ensure hydrological regime of woodlot is not disturbed ○ Limit construction to outside of sensitive timing windows for birds and amphibians	○ Routine inspection of erosion control devices to ensure no sedimentation impacts on water bodies ○ Inspection of final restored surfaces to ensure vegetation re-growth to minimize erosion
Turbine 9	Turbine 9 =99 m	ELC 4: This narrow community is associated with the valley of the creek. It is composed of a mixture of deciduous lowland forest, upland and hawthorn thicket community. Contains a tree species at risk, Butternut (END) and provides potential significant habitat for bat maternal roosting sites.	Vegetation: None as no clearing is required. Wildlife: Possible disturbance of wildlife during construction. Possible incidental kill of bats during operation.	○ Construction area to be clearly marked and staked to reduce footprint impacts ○ Limit construction to outside of sensitive timing windows for birds and bats	○ Formal Bird and Bat monitoring program during first 3 years of operation ○ On-going reporting of bird/bat deaths by site staff

Table 2: EIS Summary for Watercourses

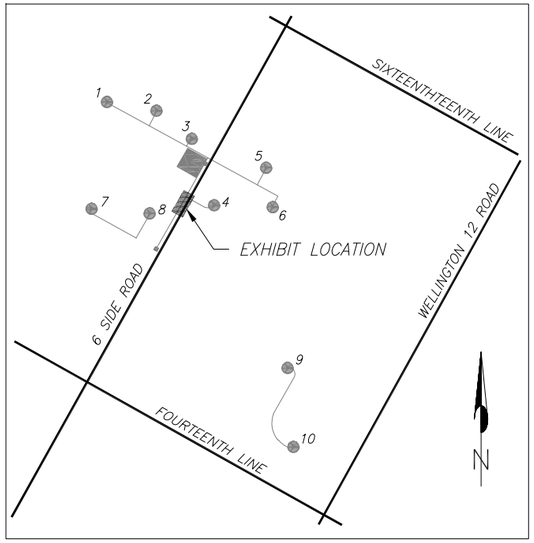
Project Component	Distance to Watercourse	Description of Watercourse	Potential Environmental Impacts	Mitigation Measures	Monitoring Requirements
Turbine 1	Turbine 1 = 50 m	No evidence of a watercourse, possible a tiled drain. No direct fish habitat, may provide a drainage/hydrological function	Hydrological: Sedimentation, disruption of hydrological function. Fish Habitat: None	○ Light duty sedimentation fencing installed around work area during construction	○ Regular inspection of sedimentation fencing during construction
Turbine 8	Turbine 8 = 88 m	Warm water creek, 0.85 m wide and 24.5 cm deep. Direct fish habitat and a baitfish (Creek Chub) community.	Hydrological: Sedimentation. Fish Habitat: Low potential Vegetation: None	○ Construction area to be clearly marked and staked to reduce footprint impacts ○ Sediment control, light duty sedimentation fencing with hay bales where drainage is towards creek.	○ Routine inspection of erosion control devices to ensure no sedimentation impacts on water bodies ○ Inspection of final restored surfaces to ensure vegetation re-growth to minimize erosion
Access road for turbines 7 and 8	74 m	Warm water creek, 0.85 m wide and 24.5 cm deep. Direct fish habitat and a baitfish (Creek Chub) community.	Hydrological: Sedimentation. Fish Habitat: Low potential Vegetation: None	○ Construction area to be clearly marked and staked to reduce footprint impacts ○ Sediment control, light duty sedimentation fencing with hay bales where drainage is towards creek.	○ Routine inspection of erosion control devices to ensure no sedimentation impacts on water bodies ○ Inspection of final restored surfaces to ensure vegetation re-growth to minimize erosion
Underground electrical cable between Turbines 8 and 3	N/A	Warm water creek, 0.85 m wide and 24.5 cm deep. Direct fish habitat and a baitfish (Creek Chub) community.	Hydrological: Sedimentation, disruption of hydrological function. Fish Habitat: High potential Vegetation: Some vegetation will be removed for access road construction	○ Cable to be installed using directional drilling ○ Follow directional drilling procedures noted in section 1.2.2 ○ Maintain an Emergency Frac-out Response and Contingency Plan as described in section 1.2.2	○ Regular inspection of sedimentation fencing during construction ○ Pre- and post-installation inspections by a fisheries biologist ○ Obtain scientific collector's permit from the MNR if fish relocation is required
Turbine 4	Turbine 4 = 39 m	Warm water creek, 0.85 m wide and 24.5 cm deep. Direct fish habitat and a baitfish (Creek Chub) community.	Hydrological: Sedimentation. Fish Habitat: Low potential Vegetation: None	○ Construction area to be clearly marked and staked to reduce footprint impacts ○ Sediment control, light duty sedimentation fencing with hay bales where drainage is towards creek.	○ Routine inspection of erosion control devices to ensure no sedimentation impacts on water bodies ○ Inspection of final restored surfaces to ensure vegetation re-growth to minimize erosion
Underground electrical line running from turbine 8 to turbine 9	25 m	Warm water creek, 0.85 m wide and 24.5 cm deep. Direct fish habitat and a baitfish (Creek Chub) community.	Hydrological: Sedimentation. Fish Habitat: Low potential Vegetation: None	○ Construction area to be clearly marked and staked to reduce footprint impacts ○ Sediment control, light duty sedimentation fencing with hay bales where drainage is towards creek.	○ Routine inspection of erosion control devices to ensure no sedimentation impacts on water bodies ○ Inspection of final restored surfaces to ensure vegetation re-growth to minimize erosion
Transmission line along 16th Line and Sideroad 18	26 – 77 m	Warm water creek, 1.15 m wide and 15 cm deep. Direct fish habitat and a baitfish (Creek Chub and Brook Stickleback) community Several drains flow into the ditch. A 60cm CSP conveys flow beneath road. The ditches are grasses and the downstream is channelized with moderate flow 30 to 60cm wetted width.	Hydrological: Sedimentation. Fish Habitat: High potential Vegetation: None	○ Implement and erosion and sediment control plan as noted in Section 1.2.1 of the Revised Environmental Impact Assessment Report. ○ Schedule grading o avoid times of high runoff volumes (spring and fall). ○ Store any stockpiled materials and refueling materials away from the feature to prevent substances from inadvertently entering the feature. ○ Keep sediment and erosion control measures in place until disturbed areas have been stabilized.	○ Schedule construction and reclamation activities to be conducted as close to each other as feasible so as to minimize the time any area is disturbed. ○ Erosion and Sedimentation Control plan to be implemented as outlined in Revised Design & Operations Report (GENIVAR, 2011). ○ An environmental inspector will be hired to make frequent site inspections and to ensure compliance with all environmental policies and plans. ○ The inspector will make regular

Project Component	Distance to Watercourse	Description of Watercourse	Potential Environmental Impacts	Mitigation Measures	Monitoring Requirements
					inspections of all activities which may cause adverse effects and of any implemented mitigation measures (sediment fencing, etc.). ○ Inspection of final restored surfaces to ensure vegetation re-growth to minimize erosion. ○ Pre- and post construction inspections of all water bodies, where construction will take place within 120 m, by a fisheries biologist to identify fish habitat and to ensure habitat function is restored after construction.

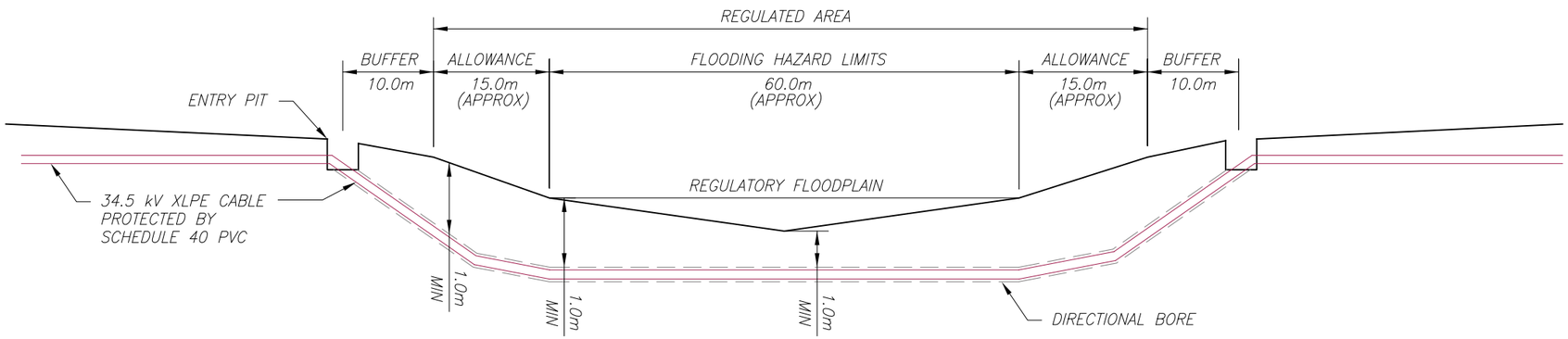
Appendix I



PLAN VIEW



KEY MAP



PROFILE VIEW

LEGEND

- PURPOSED COLLECTOR LINE
- PROPOSED COLLECTOR LINE IN ROAD R.O.W.
- PURPOSED ACCESS ROAD
- REGULATION LIMIT
- BOTTOM OF DITCH
- FENCE
- DIRT ROAD
- CULVERT
- DRAINAGE NETWORK
- STEEL POST
- ESTIMATED FLOODPLAIN

NOTES

1. <ENTER NOTE 1 HERE, TEXT WILL AUTOMATICALLY WRAP TO THE NEXT LINE AS REQUIRED, DO NOT USE RETURN, TAB, OR ENTER. ONLY USE ENTER WHEN A NEW NOTE IS DESIRED>
2. UNDERGROUND DIRECTIONAL BORE TO MAINTAIN A MINIMUM DEPTH SEPARATION OF 1m FROM WATERWAY SURFACE WITHIN GRAC REGULATED AREA.

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ST: REG: EXP:

NEXTera ENERGY RESOURCES

REV	DESCRIPTION	ENG	DWN	CHK	DATE
A	FOR REVIEW	AGS	BJP	AGS	06/22/11

ENG: A. SPERO
DWN: B. PITT
CHK:
APP:
DATE:

NEXTERA ENERGY CANADA, ULC
CONESTOGO COLLECTION

WATER CROSSING #1

SCALE: SCALE | DRAWING: 17653-6401 | REV: A