



September 13, 2017

Algonquin Power Co.
 354 Davis Road
 Oakville, ON
 L6J 2X1

Attn: Ariel Bautista, Senior Project Manager

Dear Mr. Bautista:

**Re: Review of Draft Pre-Construction Study – Windlectric Project
 Preliminary Geotechnical Comments on August 29, 2017 Submission**

Our detailed review of this most recent submission is ongoing, including additional information provided August 7th. We are awaiting comments from our team with respect to the August 29th submission regarding the following.

- Electrical

We anticipate receipt of these comments by September 15, 2017.

Geotechnical comments have been received and are based on the following report:

- Municipal Roads, Geotechnical Borehole Investigation Amherst Island Wind Energy Project, Amherst Island, Ontario, dated Aug 29, 2017, prepared by Stantec Consulting Ltd (the Report)

It is noted that the Geotechnical Borehole Investigation Report dated August 29, 2017, has not addressed our previous comments dated August 3, 2017. Please note our expectation that your next submission will address all outstanding comments.

We have further analyzed this report and have the following additional comments:

1. Traffic Load Estimation

The following table summarizes the traffic loading as reported in previous 3 versions of the reports.

Road	Estimated Construction Traffic as per Report Dated Mar 9, 2017 (ESAL)	Estimated Construction Traffic as per Reports Dated July 20 and Aug 29, 2017 (ESAL)	Difference/Reduction of Construction Traffic Estimation between Report Dated Mar 9 and Report Dated Aug 29	
			ESAL	%

Front Road	1,000	1,000	0	0
Stella 40 Foot Road	25,500	13,000-15,000	12,500-10,500	49-41
2 nd Concession Road	15,300	4,000-9,000	11,300-6,300	74-41
3 rd Concession Road	5,300	3,500	1,800	34
South Shore Road	15,300	6,000-8,000	9,300-7,300	61-48
Lower 40 Foot Road	5,100	3,500	1,600	31

As can be seen from the above table, this Report has significantly reduced the estimation of construction traffic up to 74% but with no explanation and justification. The Report should provide details to explain how the construction traffic are reduced with detailed traffic data assessment (including type of truck, number of axles and total loading) and calculations in order to avoid under-estimation of construction traffic that may jeopardize the stability and integrity of the roads.

2. Increase in Construction Traffic to the Existing Roads

The following table summarizes the increase in construction traffic, as per data of Report Dated March 9, 2017, to the Existing Roads.

Road	Estimated Construction Traffic as per Report Dated Mar 9, 2017 (ESAL)	Estimated Construction Traffic as per Reports Dated July 20 and Aug 29, 2017 (ESAL)	Assessed Traffic Load Support Conditions of Existing Roads as per Reports (ESAL)	Increase in Construction Traffic to the Existing Roads	
				ESAL	%
Front Road	1,000	1,000	1,000	0	0
Stella 40 Foot Road	25,500	13,000-15,000	2,000	23,500	1175

2 nd Concession Road	15,300	4,000-9,000	1,000	14,300	1430
3 rd Concession Road	5,300	3,500	1,000	4,300	430
South Shore Road	15,300	6,000-8,000	2,500	12,800	512
Lower Forty-Foot Road	5,100	3,500	1,300	3,800	292

As can be seen from the above table, there is significant increase in traffic loading up to 23,500 ESAL (1175% increase) on Stella Forty-Foot Road, and up to 1430% (14,300 ESAL) on 2nd Concession Road. Two methods of road upgrade were discussed in Sections 6.5.1 and 6.5.2 of the Report but no justifications and calculations were provided in the Report to substantiate that the proposed methods are sufficient to support such an increase in traffic loading. Under-design of road improvement, if any, may result in road damage, traffic safety and expensive maintenance/repair costs.

Further, the design of road improvement should also consider the adverse impacts due to road drainage and frost actions.

3. Subgrade Conditions

The Report described the subgrade soil as Sandy Clay. However, the borehole logs reported that 26 out of 34 boreholes encountered CL and CH type CLAY (i.e. Lean to Fat Clay) indicating a weak subgrade material. The road improvement design should be revised to take this into consideration. Further, as suggested in the publication of geogrid supplier, an additional layer of geotextile should be placed between the proposed Combigrid and clayey subgrade to prevent squeezing and pumping of fines to the granular base.

4. Upgrades to Existing Roads

Sections 6.5.1 (Gravel Surface Roads) and Section 6.5.2 (Asphalt Surface Roads) of the Report discussed the proposed upgrades to existing Roads. Our comments as follows:

- 4.1 1st paragraph of Section 6.5.1: as discussed in Item (2) of this email, the proposed upgrade should be substantiated.
- 4.2 3rd paragraph of Section 6.5.1: The Front Road should also be upgraded in case if heavy vehicle will use the road due to detour or by mistake.

- 4.3 4th paragraph of Section 6.5.1: all roads less than 6 m width should be upgraded in the same manner as the above roads (see Item (2) above) under construction traffic.
- 4.4 1st paragraph of Section 6.5.2: only Option 2 (i.e. upgrade by removal and replacement of geogrid and Granular A) is acceptable. Further, similar to Item 4.1 above, the proposed upgrade should be substantiated.
5. The Report should recommend that all roads should be inspected and monitored by an experienced professional engineer regularly (inspection frequency to be approved by the Township) to ensure traffic safety during construction period. Inspection reports should be submitted to the Township for record.
6. The Report should recommend that all roads should be inspected and reassessed thoroughly after construction and all defects/damages should be repaired to the satisfaction of the Township. Inspection and repair reports should be submitted to the Township for record.

7. **Dump Road**

Section 6.6.1 of the Report proposed the upgrade of Dump Road. The boreholes drilled along Dump Road reported that the subgrade material is CLAY (instead of sandy clay). An additional geotextile should be placed between geogrid and subgrade (see Item (3) above).

Yours truly,



David MacPherson, C.E.T.
Public Works Manager
DM/ka

cc: Robert Maddocks, CAO
Murray Beckel, Director of Planning and Development Services
David C. Thompson, Director of Infrastructure Services
Dan Fencott, Jewell Engineering
Guy Laporte, Jewell Engineering