Q. **Reference: *Structural Capacity Assessment of the Labrador Island Transmission Link (LITL),* EFLA, April 28, 2020, pages 28-29.**

"Further explanation of design loading assumptions:

- *One type of ice was considered in each loading zone based on the dominant icing type. Rime ice was specified in zones 2a-2c, 5 and, 7a-7c. Glaze ice was specified in other zones. Rime icing is the critical icing loading case for 158 km (15%) of the line and the glaze ice for 922 km (85%).*

- *Terrain roughness category for the wind was assessed as category B for areas with rime ice (i.e. zones 2a, 2b, 2c, 5, 7a, 7b and 7c) but category C for all other areas.*

- *Wind speeds were increased in zones 2a-2c, 5, 7a-7c and 9 partly to account for local topographical effects. The wind speeds were increased by a factor of 1.64 in zone 7a, 7b and 7c compared to values specified in CSA/CAN. Topography effects were not considered in other loading zones."*

Please explain why EFLA's assumption regarding terrain roughness is different from Section 6.2.2 Terrain roughness of the CSA Standard CAN/CSA C22.3 No. 60826-10 which states *"Terrain type B is representative of the majority of lines and should lead to acceptable results in all areas except in flat coastal areas, where a terrain type A should be used."*

A. The objective of the EFLA Consulting Engineer's study was to assess the as-built capacity of the Labrador-Island Link ("LIL") as benchmarked against CAN/CSA 22.3 No. 60826-10 Design Criteria of Overhead Transmission Lines, which allows for flexibility in the selection of specific design parameters. Given the intent of the study was to assess the as-built condition of the LIL it was appropriate to maintain the underlying assumptions used in the design, which were compliant with the CSA design standard. As such, the study uses the terrain categories as selected by the original designers of LIL.

Table 1, reproduced from the CSA standard provides a description of terrain categories used in the standard.

Table 1 – Terrain Categories, reproduced from CSA Standard

Terrain Category	Roughness Characteristic	Relative Influence on Wind Loading Compared to Category B		
		10 m height	20 m height	30 m height
A	Large stretch of water upwind, flat coastal areas	1.08	1.09	1.06
B	Open country with very few obstacles, for example, airports or cultivated fields with few trees or buildings	1.00	1.00	1.00
C	Terrain with numerous small obstacles of low height (hedges, trees and buildings)	0.80	0.83	0.83
D	Suburban areas or terrain with many tall trees	0.55	0.58	0.58

Based on the terrain category descriptions identified in the CSA standard, it is likely that the majority of the LIL can be appropriately classified as terrain category C, given the comprehensive vegetation clearing activities that were conducted along the majority of the line route. It would be a conservative approach to assume that the majority of the line traverses areas that are representative of terrain category B. Further, the statement "Terrain type B is representative of the majority of lines and should lead to acceptable results in all areas except in flat coastal areas, where a terrain type A should be used" is a very broad statement which implies that the same design terrain factors should be used for a line design in Canada whether it be located in the open Canadian Prairies, the densely vegetated mountains of Alberta or the thick boreal forests of Newfoundland. While use of terrain category B for the entire line would have been a more conservative approach, it would have also resulted in higher capital costs which would have had to be carefully considered in relation to the perceived increase in reliability.

However, to better understand the implications of such effects, the "Assessment of LIL Reliability in Consideration of Climatological Loads," to be completed by Haldar & Associates Inc., is planned to include a sensitivity study of the key parameters and their impact on reserve capacity factors, also referred to as use factors. Assessment of terrain factors will be included as

part of this sensitivity study for critical sections to better understand the impact this could potentially have on the structural capacity of the LIL.