

1 **NextBridge Interrogatory # 24**

2
3 **Reference:**

4 EB-2017-0364 - February 15, 2018 HONI Lake Superior Link Application, EXHIBIT B, TAB 1,
5 SCHEDULE 1, page 8, lines 11-14; EB-2017-0364 LSL Motion Additional Evidence
6 Attachment 5; EXHIBIT C, TAB 2, SCHEDULE 1.

7
8 **Interrogatory:**

9 Preamble: "Hydro One is proposing to convert approximately 35km of the existing 230 kV
10 double-circuit transmission line by upgrading to a four circuit transmission line
11 (replace the existing double circuit towers with four circuit guyed towers and add
12 conductors and insulators for the two new circuits."
13

- 14 a) Provide copies of the current tower designs for the four circuit transmission line, including
15 all load trees, finite element models, and tower weight.
16
- 17 b) Provide the all-in (design, testing, manufacturing, delivery, assembly, construction) cost
18 estimate for the four circuit towers to be used in Pukaskwa National Park. Explain where in
19 Table 3 of the Application these costs are captured.
- 20 i. Breakdown the all-in costs by design, testing, manufacturing, delivery, assembly and
21 construction, including conductor, insulators, and retrofitting the existing foundations.
 - 22 ii. Compare the all-in cost of the four circuit transmission towers to the all in cost
23 estimate for double circuit transmission towers outside of Pukaskwa National Park.
 - 24 iii. Provide copies of all workpapers associated with the all-in costs for the four circuit
25 and double circuit transmission towers.
26
- 27 c) Provide the right of way width selection criteria for HONI's four circuit transmission tower
28 design, including conductor blowout clearance criteria to the edge of the existing East-West
29 Tie Line right of way, and any conductor blowout weather cases.
- 30 i. Provide a table of the blowout clearance to the edge of the right of way in all of the
31 swing conditions and using the OEB's 5 year gust condition for all span lengths.
32
- 33 d) Identify any example in which a transmission line of 230 kV or higher has used 80- to 90
34 consecutive four circuit transmission towers. If any example is provided, identify the owner
35 of the line, the geographic location of the line, whether the line has experienced a forced
36 outage over 1 day, including the cause and duration of the outage, and whether the outage

1 was caused by a tower collapse. If there was a tower collapse, identify whether the tower was
2 designed to a 1 in 50 or 1 in 100 year weather event.

3
4 e) Provide copies of all documents and correspondence with and from NPCC and NERC related
5 to the use of the Lake Superior Link four circuit transmission towers.

6
7 f) Provide any visual simulations of the four circuit transmission line.

8
9 g) For the last 3 years, provide copies of all documents, analyses, and studies related to the
10 design, testing, manufacturing, delivery, assembly, construction, maintenance, and operation
11 of the proposed four circuit transmission line.

12
13 **Response:**

14 a) Please refer to Exhibit I, Tab 1, Schedule 2 for an update on the current quad circuit for the
15 Pukaskwa National Park. Drawings of the current quad circuit tower design are included in
16 Attachment 1.

17
18 b) The cost of design, testing, manufacturing and delivery are considered under the material
19 cost. The cost of assembly and construction are reflected under the construction cost of Table
20 3.

21 i. This will not be provided.

22 ii. The option of a double circuit line outside of PNP was not considered due to the
23 increased footprint and higher environmental impact.

24 iii. Costs of material supply and construction have been determined through a
25 confidential bid process and extensive industry knowledge. The results of this
26 exercise are confidential.

27
28 c) The existing ROW width is 150 ft. The determination of the Right of way width has been
29 done based on Hydro One standard LD-50-002 and LD-11100-001. Refer to PNP - Clearance
30 Requirements to the Edge of the ROW in Attachment 1.

31
32 d) Hydro One does not have any examples of transmission line of 230 kV or higher with 80-90
33 consecutive four circuit towers. That said, Hydro One has successfully built and operated the
34 230 kV Cherrywood TS by Clarington TS transmission lines which have a section with 48
35 consecutive four-circuit towers. None of these towers have failed since they were installed.

1 e) There is no correspondence with the NPCC or NERC related to the LSL four-circuit towers.
2 No such correspondence is required or relevant as documented and thoroughly explained by
3 Mr. Bing Young at the technical conference in his discussions with Mr. Murphy pertaining to
4 KT 2.3 on Day 2 of the NextBridge Motion to Dismiss Technical Conference¹.

5
6 f) Please refer to Exhibit I, Tab 1, Schedule 24, Attachment 1.

7
8 g) The proposed four circuits' guyed tower defined under question 24 a. is a new design that is
9 being specifically developed for this project. We have currently completed the design aspects
10 and we are scheduling to fabricate, assemble and test the prototype tower by May 2019.

11
12 The design documentation related to the 4 circuit guided structure is proprietary information
13 and will not be provided in this response. The other documents requested are not available at
14 this stage.

¹ EB-2017-0364 – NextBridge Motion to Dismiss Technical Conference – May 17, 2018 – Commencing at Page 79, Line 26 through to Page 88, Line 16.