

1 Q. **Tab D; Volume 1: Capital Projects over \$200,000 and less than \$500,000 (Replace Radomes)**

2 The proposed project, outlined on pages D-72 to D-79, includes replacement of 14 radomes at
3 various locations within Hydro's microwave network.

4 Has Hydro investigated technology alternatives that could reduce the size of Hydro's microwave
5 network or eliminate it (such as leased circuits from a telecom service provider, Hydro-funded
6 fibre builds, joint-partner funded fibre builds, and emerging wireless technologies)? If so, please
7 provide the details of any alternative analyses undertaken along with any associated cumulative
8 net present value comparisons. If not, please explain.

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11 A. Newfoundland and Labrador Hydro ("Hydro") is continually investigating alternatives and has
12 utilized technology alternatives to remove two microwave radio hops. Hydro's office at Bishop's
13 Falls¹ is now served by fibre-based leased facilities and Hydro has installed private fibre ring at
14 Hinds Lake.² Hydro has several Indefeasible Rights of Use ("IRU")³ agreements with third parties
15 for the use of dark fibres that are used for administrative and SCADA⁴ traffic. Hydro has installed
16 fibre on newer transmission lines, such as TL 267, that is used for teleprotection between Bay
17 d'Espoir and the Avalon Peninsula. Hydro uses leased facilities where they are available and are
18 the least-cost options and have several wireless radio links in service.

19 The main purpose of Hydro's microwave radio system is to protect and control Hydro's
20 generation and transmission assets. These include the 230 kV terminal stations from St. John's
21 to Bay d'Espoir, the hydro plants at Bay d'Espoir, Granite Canal, and Upper Salmon as well as the

¹ The microwave radio link between Bishop's Falls office and Sandy Brook Hill was replaced by leased services in 2019. The decommissioning of the old equipment will be completed in late 2020 or early 2021.

² The radio link between Hinds Lake Plant and Blue Grass Hill was replaced by a private fiber network around 2009. All equipment including two steel towers have been decommissioned and removed.

³ In telecommunications, IRU is the effective long-term lease (temporary ownership) of a portion of the capacity of a cable. IRUs are specified in terms of a certain number of channels of a given bandwidth or optical fibers. The IRU is granted by the company or consortium of companies that built the cable.

⁴ Supervisory Control and Data Acquisition ("SCADA").

1 required control structures. While it is possible to use fibre-based services at certain locations
2 on the Avalon Peninsula it is not feasible to install fiber at Hydro's remote locations or around
3 the reservoirs.

4 Protection of Hydro's transmission lines requires a very reliable communications network. Fibre
5 offered by third parties cannot guarantee this as it is susceptible to breaks and outages whereas
6 the microwave system has an availability of 99.9999%.

7 Hydro will continue to explore new and existing technologies to ensure the utilization of the
8 least-cost options that are consistent with reliable service.