

## ENGINEERING AND OPERATIONS

**Report:** 20. Peace River Site C Hydro Project – Stage 2 Review of Potential Downstream Changes from Site C Operations – Preliminary Findings

**Prepared by:** BC Hydro

**Summary:** This report is a review of selected studies on potential Site C operations and the potential changes to the downstream river regime.

Overall, preliminary studies associated with downstream flows, water elevations, sediment transport and geomorphology suggest there would be relatively few notable changes beyond those within a few kilometres downstream of the dam.

Hydroelectric facilities on rivers can change ice conditions either by creating a barrier that gathers ice on the upstream end of the dam and pushes an ice front upstream and/or by changing the temperature of the water flowing downstream, which reduces or promotes ice formation, depending on whether the water is warmer or cooler during the winter months.

Both the Site C dam and Alberta's proposed Dunvegan Hydroelectric Project would change ice formation in the Peace River if either or both were to proceed to construction. If winter water temperatures are warmer than current conditions at the proposed Site C location, the ice formation changes would be beneficial to the town of Peace River due to a reduced frequency of spring ice jamming associated with the Smoky River breakup. If the winter water temperatures are cooler, ice break-up may occur later in the year. There may also be an effect on the formation and use of ice bridges downstream of the project.

Additional water temperature modelling of the proposed Site C reservoir would be required, if the project advances to a regulatory review, to further refine our understanding of the changes to ice formation downstream. In addition, studies associated with downstream flows and elevations, and geomorphology and sediment transport would also be conducted to better understand potential impacts. These studies would be identified through a data gap analysis, and discussions with regulatory agencies, First Nations and stakeholders.