

Backgrounder

Mactaquac Generating Station Life Achievement Project



Project Description

Mactaquac Generating Station is a 670 megawatt run-of-the-river hydro generating station located on the Saint John River in Mactaquac, New Brunswick, Canada. It is situated approximately 19 kilometres west of Fredericton, New Brunswick's provincial capital.

The station was commissioned in 1968 with three turbine-generating units, and provides renewable electricity that is distributed and sold by NB Power. An additional three turbines were brought into service in 1972, 1979 and 1980.

The station consists of the following major components:

- An earthen dam constructed of rock-fill and sealed by clay.
- A 96 km reservoir (headpond) on the Saint John River between the station and the Town of Woodstock that rises 40 metres in height above the downstream river level.
- Two concrete spillways, each consisting of five bays and equipped with mechanically-driven metal gates which allow excess water to spill downstream during high flows.
- An intake structure.
- A powerhouse that houses six Kaplan-style hydroelectric turbines and associated equipment and instrumentation.

Mactaquac Generating Station is the largest of seven hydroelectric dams currently in operation in New Brunswick.

Since the 1980s, concrete portions of the hydro station have been affected by a chemical reaction called alkali-aggregate reaction. The reaction causes the concrete to swell and crack and has required substantial annual maintenance and repairs.





In anticipation of an early station retirement NB Power began consulting in 2013 with engineers, scientists, stakeholders, the public and First Nations on potential future options.

These options included building a new station, removing all structures except for the earthen dam, removing all structures and restoring the Saint John River to its natural flow, or maintaining the station to its original intended lifespan of approximately 2068 through various means of rehabilitation.

In December 2016, NB Power recommended maintaining the station to its intended lifespan. This recommendation followed a fact-based decision process involving NB Power's Board of Directors, and balancing environmental, social and technical, and cost considerations.

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Life achievement at Mactaquac will focus on maintaining existing concrete structures and associated mechanical equipment to the original 100-year service life of the station (2068) or as close as possible to it.

The work is expected to involve the following components:

- Controlling water seepage with grouting and surface sealing;
- Repairing damaged and deteriorated concrete including gate guides, bridges and rollways;
- Replacement of assorted mechanical and electrical components including gates, cranes, pumps, piping, cabling and controls;
- Removing and replacing six turbines;
- Modifying powerhouse superstructure;
- Installation of multi-species fish passage.

The specific approach to be taken with items listed above will be based on results of ongoing studies and detailed planning to define how existing concrete structures and their associated mechanical equipment could be maintained as operational, repaired as necessary or partially or fully refurbished in place.

Pending regulatory approvals, the majority of activities are expected to take place between 2020 and 2036.

For more backgrounders on other topics of interest and project updates, visit the [project website](#).
