Lower Churchill Hydroelectric Generation Project: Overview of the Muskrat Falls Development

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Nalcor Energy is proposing to develop two hydroelectric generation facilities, including construction of associated dams and reservoirs, on the lower Churchill River in central Labrador. One will be located at Gull Island and one at Muskrat Falls. The Project also includes transmission lines between Muskrat Falls and Gull Island and from Gull Island to the existing Churchill Falls facility. Project construction will be a major undertaking, which will require a large effort including materials supply and transportation, support infrastructure, equipment and labour. Temporary access roads will be required, and construction camps built and partial clearing will take place in reservoir areas.

The reservoir flooding required for the Project is 126 km², approximately 5 percent of the 2,500 km² occupied by the Smallwood Reservoir at Churchill Falls. The Project will produce 16.7 terawatt-hours (TWh) per year which is approximately 50 percent of the energy generated at Churchill Falls.

The Muskrat Falls Generation Facility will have a capacity of 824 MW. The main components include: the powerhouse, with four fixed propeller or variable-pitch Kaplan turbines; a concrete dam with two sections on the north and south abutments of the river; the south section dam will be 29 m high and 325 m long, while the north section will be 32 m high and 432 m long.

The construction of the dam at the Muskrat Falls site will result in the formation of a reservoir 59 km long, inundating 41 km². The Muskrat Falls Generation Facility will be different from the Gull Island Generation Facility in that the facility will not have penstocks; the approach channel will direct the water from the reservoir into the power intakes, where concrete spiral cases will distribute water through the turbines. The water will then discharge into the tailrace. The passage of flows in excess of power generation requirements will be through a spillway. The facility will also have transformers and a switchyard, which will raise the generation voltage to 230 kV. Access to the Muskrat Falls site will be from the south side of the river, via Black Rock Bridge, which is located 8 km west of Happy Valley-Goose Bay. A construction accommodations complex will be built for up to 1,000 workers.

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