

NAMMINIVUT

KANGIRSUK HYDROPOWER PROJECT



SAPUTIK LANDHOLDING CORPORATION OF KANGIRSUK



Tasialuk Lake

Tasialuk is at a 100-meter elevation and flows naturally down into Payne River.

It is not, in itself, an important subsistence lake, but it is a vital highway in the wintertime, with access to other lakes and campgrounds that the community relies on for subsistence activities. Thanks to its proximity to the village of Kangirsuk, Tasialuk is used by the community for festive activities such as community fishing derbies at Christmas or other holidays.



2016

Hydro consultant, Pentti Sjoman calls the Mayor of Kangirsuk about a potential hydro project at Tasialuk.

2019

Saputik LHC receives Northern REACHE funding to do a preliminary study. This preliminary study shows that there is potential for a hydropower project.

2021

2021

In September, two hydro engineers visit the site and do fieldwork.

In March, the technical feasibility study is issued. Phase 1 study shows that a hydro project on Tasialuk Lake could offset up to 80% of the diesel-generated electricity. A phase 2 study is recommended as a preliminary environmental impact study, with some additional engineering.

In April, Saputik and Tarquti apply for Northern REACHE funding for the phase 2 study.

In July, Northern REACHE finances phase 2 and the study is approved.

In September 2022, some fieldwork is performed by the environmental, geotechnical and engineering consultants. Tarquti helps coordinate all activities, logistics and funding. With Saputik LHC and Tarquti community engagement and local FM radio sessions are held.

2023-2025

Saputik LHC and Tarquti will continue informing the community members about every step of the project development and listening to Kangirsumiut's interests and priorities to take charge of the local energy transition. More studies will be conducted, and community consultation will be planned throughout the socio-environmental assessment.

IN THE MEANTIME

The Project Milestones

If you wish to ask questions about the hydropower project in Kangirsuk, you can send an email.

kangirsuk@tarquti.ca

Project Highlights

Some facts based on the phase 1, engineering study.

1,000 kW
hydro project for Kangirsuk

56%
could be offset of the load for a run-of-river hydro project

\$30M
is the total project estimated cost

81%
could be offset of the load with a 3-meter of drawdown storage

450 kW
of average load (about 3.9 million kWh/y)

5 local operators would be needed to run the hydro plant project

Radio Consultation Outline

On September 8, 2022, Tarquti hosted a radio call-in show regarding the Kangirsuk Hydro Project. Hydro engineer Pentti Sjoman and biologist Michelle Lavictoire supported the consultation with Alec Kudluk and Sarah Airo of Saputik Landholding.

Joë Lance, Andy Pirti, Justin Bulota, and Janice Grey presented the results of phase 1 and the study and fieldwork of phase 2. The research planned in phases 1 and 2 aims to determine if the project is technically and economically feasible. Here is an excerpt of the most frequent questions and answers asked during the radio consultation.

HOW MANY LITRES OF DIESEL DOES THE CURRENT POWER PLANT USE IN A YEAR?

The Hydro-Quebec diesel generating station uses about 1.3 million litres of diesel fuel annually. With Kangirsuk, the average annual load would be approximately 450 kW, using about 3.9 million kWh per year. The Kangirsuk hydro plant would offset the following: 1) Run-of-River: 2.20 million kWh, offsetting about 734,000 litres of diesel fuel. 2) With 1 m of drawdown: 2.4 million kWh, offsetting about 814,000 litres of diesel fuel. 3) With 3 m of drawdown: 3.2 million kWh, offsetting about 1,056,000 litres of diesel fuel.

OTHER THAN INUKJUAQ, IS THERE A SIMILAR HYDRO PROJECT IN A COMPARABLE COMMUNITY? WILL KANGIRSUMIUT BE ABLE TO VISIT INUKJUAQ, FOR EXAMPLE?

There is no run-of-river hydro project that is benefiting from a natural reservoir in Nunavik. Inukjuak's hydro project is different because it is run-of-river dam that is creating the intake reservoir. Also, the Inukjuak hydro project is 7,500 kW, while the proposed Kangirsuk hydro project will be 1,000 kW. As a comparison, Hydro Quebec's largest hydro plant, La Grande, is 5,616,000 kW, and the smallest hydro plant, Mitis, is 4,000 kW (built-in 1947). There is a very similar hydro plant however near Tasiilaq, in Greenland (east side, 65.6 degrees north, while Kangirsuk is at 60.0 degrees north). The Tasiilaq hydro plant is 1,200 kW and draws its intake in a lake (about 100 m above the ocean). It has a 1,200 m of 42-inch diameter buried pipe and is approximately 1.9 km from the community, with a Turgo-type turbine generator. The Kangirsuk hydro project, on the other hand, would have 2 Turgo-type turbine generators.

TASIALUK IS NOT A RIVER. HOW WILL IT PRODUCE HYDROELECTRICITY? WHAT ABOUT WHEN IT'S FROZEN?

Tasialuk has a catchment area of 67.3 square kilometres (km²), and the hydro intake will happen from this area. Tasialuk is about 100 m above the Payne River, and the elevation drop will be used by the hydro plant with Tasialuk's inflow (along with drawdown storage in the lake) to make green renewable electricity. Even frozen, the lake will be able to produce hydroelectricity because the hydro intake at Tasialuk will be deep enough to allow for the 3 metres of drawdown and 1.5 m of ice thickness.

HOW LONG AND WIDE IS THE PIPELINE?

The penstock pipeline is 2,316 metres, with a 1.2-meter and 1.06-meter diameter polyethylene plastic pipe. The penstock pipeline will be buried. At the intake, the pipe is about 7 metres deep. From where the pipeline crosses the existing road to the powerhouse, the pipe is 1 metre below the surface.

CAN WE DECIDE ON A YEAR-BY-YEAR BASIS HOW LOW THE WATER LEVELS WILL GO DOWN? OR DO WE HAVE TO CHOOSE ONE AND STICK WITH IT?

The hydro plant intake is currently designed to allow up to 3 metres of drawdown in Tasialuk. When the hydro plant is operating, the amount of drawdown can be decided daily. However, the 3-metres supply more electricity and offset a larger amount of diesel-generated electricity.

WILL WE STILL GET OUR POWER THROUGH HYDRO-QUÉBEC, OR WILL THERE BE A NEW UTILITY?

You will still get your power through Hydro-Québec. The electricity produced by the hydro plant will be owned by the people of Kangirsuk and sold to Hydro-Québec. Hydro-Québec will still manage the local grid and deliver power to the houses and other buildings.

HOW MANY MONTHS OF THE YEAR WOULD WE HAVE HYDROPOWER IF THE HYDRO PLANT IS (1) FOLLOWING THE RUN OF THE RIVER, (2) A 1-METER DRAWDOWN, OR (3) A 3-METER DRAWDOWN?

1) A run-of-river hydro plant would supply 100% of electricity from early July to mid-November (about 4½ months), supplying approximately 2,203,000 kWh or about 56% of a load. 2) A hydro plant with 1 metre of drawdown storage would supply 100% of the electricity from early July to mid-January (about 6½ months), supplying approximately 2,443,000 kWh or about 62% of the load. 3) A hydro plant with 3 metres of drawdown storage would supply 100% of the electricity from early July to mid-March (about 8½ months), supplying approximately 3,167,000 kWh or about 81% of the load.

WILL THE PROJECT AFFECT THE QUALITY OF OUR MUNICIPAL DRINKING WATER SUPPLY?

No, the hydro project will not affect the drinking water quality. The water intake will need to be extended deeper into the lake to allow for the 3 metres of drawdown storage. During the hydro project intake construction, there will be some underwater excavation in Tasialuk. A slit-curtain will be used to isolate the underwater excavation area. The dirty water from the underwater excavation will be contained inside the slit curtain. After the sediment inside has settled to the bottom, the slit-curtain will be removed. The hydro intake will then be ready for operation. How the drawdown will affect getting snowmobiles onto Tasialuk and routes across the lake is unknown. However, with the gradual (slow) drawdown over months, the lake ice will gradually settle on to the shallow areas around the edge of Tasialuk. In deeper water, the ice will float just like it does now. In the early years of operation, we will need to monitor the effect on the ice and the ability to get onto Tasialuk and travelling across the lake. If required, the operation of the hydro plant can be changed or we can look at alternative routes.

WILL THE PROJECT AFFECT THE LAKE ICE THAT WE USE TO TRAVEL IN THE WINTER MONTHS? IF SO, WILL THERE BE ALTERNATE ROUTES CREATED?

The run-of-river option will not affect the lake ice. During winter, because there is very low inflow into Tasialuk, the hydro plant would likely be shut down. Tasialuk winter water levels would be the same as it is now. With the drawdown options, Tasialuk water and ice levels will gradually change over many months. 1) With 1 metre of drawdown, Tasialuk water and ice levels will change over 2 months, from mid-November to mid-January. The levels will remain 1 metre lower until the spring melt (in May). The lake will then fill to its normal water level. 2) With 3 metres of drawdown, Tasialuk water and ice levels will change over 4½ months, from mid-November to late March. The levels will remain 3 metres lower until the spring melt (in May) and will then fill to its normal water level.



Why we print this report and distribute it?

We must ensure the entire community has access to such important information on such a lifelong project. Radio and mailing are key in sharing information in Nunavik. For the energy-curious one, rest assured that the resources and energy used to print these reports are **not more than starting a gas vehicle twice.**



Do you want to learn more about the project?

A copy of phase 1 technical feasibility report is available for anyone to read at the Saputik LHC office. A PDF of phase 1 report is also available (note that it is a large file). The full-feasibility study (combined reports of phases 1 and 2) will be issued in March 2023. A copy of this full-feasibility study report will be available for anyone to read at the Saputik LHC office (April 2023).

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