photo: www.archbould.com

Yukon Energy

Rural Generating Facilities

photo : Yukon Energy

YUKON ENERGY

Yukon Energy's Rural Facilities

Yukon Energy has three hydro facilities – one in Whitehorse on the Yukon River, one located at Aishihik Lake and one in Mayo in the central Yukon. Together, these facilities have the ability to generate up to 92 megawatts (92 million watts) of power.

This brochure provides information about Yukon Energy's operations outside of Whitehorse. Please see our companion brochure "Yukon Energy's Whitehorse Generating Facilities" to learn more about our operations in Yukon's capital.

photo: **Yukon Energy**

photo: **www.archbould.com**

top to bottom
Aishihik Lake control structure;
a section of the Mayo to Dawson transmission line;
Wareham Lake Dam

photo: **EDI Environmental Dynamics Inc.**

photo: **www.archbould.com**

photo: **Derek Crowe**

The Aishihik Facility

Our Aishihik plant is located about 110 kilometres northwest of Whitehorse. The Northern Canada Power Commission built the Aishihik hydro station in 1975 and was taken over by Yukon Energy in 1987. The Aishihik plant was needed to serve the growing electrical demands of Whitehorse and of a large lead-zinc mine at Faro in the central Yukon.

The original plant included two hydro units that could each produce up to 15 megawatts of renewable power. In 2011, a seven megawatt hydro generator was added.

The facility can now produce 37 megawatts (37 million watts) of power. That's enough to supply about 12,500 non-electrically heated homes with electricity. Aishihik annually produces about 25 per cent of the total energy generated by Yukon Energy.

The Aishihik plant is extremely important to Yukon Energy's operations. Although the 40-megawatt Whitehorse Rapids hydro facility is larger than Aishihik, the effective capacity of the Whitehorse plant is reduced by about half during the coldest months of the year because of reduced water flows on the Yukon River. Aishihik is the only hydroelectric facility in Yukon that can store energy in the summer when demand is low, to be used in the winter when demand is high. It can also store energy during wet years, to be used in dry years when the levels of the lake water are lower.

An interesting fact about this facility is that it is located 110 metres underground! It is the first underground power plant north of the 60th parallel in the western world.

Because of its underground location, some special safety features are built in to the facility that will keep people safe and allow them to escape from the plant in the event of an emergency. A safe room has a supply of food, water, blankets, first aid supplies and a telephone. There are also life jackets, hip waders, breathing devices and an inflatable raft that is assembled and ready to lower into the water going through the tailrace, a tunnel that allows water that's passed through the turbines to flow into the West Aishihik River. The one and a half kilometre long tailrace provides an alternate route for people to get back above ground to safety.

photo: **Derek Crowe**

above left to right
Aishihik's newest hydro generator, installed in 2011; surge chamber with raft

right
buffalo along the bank of the Aishihik power canal

photo: **Derek Crowe**

photo: **Derek Crowe**

photo: **Yukon Energy**

Components of Aishihik's Generating Facility

Water Storage

The Aishihik plant uses natural water storage in near by Sekulmun, Aishihik and Canyon Lakes. Water storage is regulated by two control structures, one at the outlet of Aishihik Lake and the other at the outlet of Canyon Lake, just above Otter Falls. Otter Falls can be seen on the 1954 issue of the Canadian five dollar bill. A fish ladder built as part of the Aishihik Lake structure allows fish to travel back and forth freely.

Power Canal

To the west of the Otter Falls day use area, water flows from Canyon Lake along a 5.8-kilometre canal. The canal ends at an intake structure where water drops 175 metres through an underground shaft, then flows another 915 metres through a tunnel before entering the generating station.

Generating Station

Water flowing from the tunnel turns three turbines, each connected to a generator. Once the water hits the turbines, it leaves the plant through a large tunnel known as the tailrace and flows one and a half kilometres to the West Aishihik River.

Transformers

Once the generators create electricity, it is carried through heavy cables to transformers located at above-ground substations. The transformers increase the voltage so the power can be transferred through transmission lines to various Yukon communities. Once the electricity arrives at its destination, transformers at other substations lower the voltage so the electricity can be safely used in homes or businesses.

clockwise
control structure at Aishihik Lake; generating facility; power canal

The Mayo Facilities (Mayo A and Mayo B)

The Mayo A hydro facility, located about 400 kilometres north of Whitehorse, has served people in that central Yukon community since 1951. It was developed to supply electricity to the United Keno Hill Mine at Elsa, about 45 kilometres north of Mayo. It also supplies electricity to Yukon communities via Yukon Energy's transmission system. It can produce five megawatts of power.

The Mayo B hydro facility is located 3.7 kilometres downstream from the Mayo A plant. Completed in 2011, it added 10 megawatts of hydro capacity to Yukon Energy's system. Mayo B can generate twice as much energy as Mayo A. Together the two plants can supply power for up to 7,000 non-electrically heated homes.

photo: ***EDI Environmental Dynamics Inc.***

left to right
Mayo lines; Exterior of Mayo B powerhouse

photo: ***Yukon Energy***

Components of the Mayo Generating Facility

Water Storage

The Mayo generating station uses two lakes for water storage: Mayo Lake, 50 kilometres north of Mayo and Wareham Lake, 10 kilometres north of the community.

Control Structures/Dams

The water passes through a control structure on Mayo Lake, a dam at Wareham Lake, and travels about half a kilometre through a tunnel at the Wareham dam. The water then drops approximately 36 metres to the Mayo A hydro plant where it is used to generate power. Water is supplied to Mayo B via a separate 3.7 kilometre long buried steel pipe known as the penstock. The water drops 64 metres to the Mayo B turbines.

Generating Plant

The generating plant at Mayo A consists of two 2.5 megawatt generators. Mayo B's power plant has two larger units of five megawatts each. After the water goes through the turbines it leaves the plants and flows into the Mayo River, which in turn flows into the Stewart River south of town.

Transformers

Once the generators create electricity, the power is carried through cables to transformers. The transformers increase the voltage so the electricity can be transferred through transmission lines. Once the electricity arrives at its intended location, transformers located at other substations lower the voltage so the electricity can be safely used in homes or businesses.

photo: ***www.archbould.com***

photo: ***Yukon Energy***

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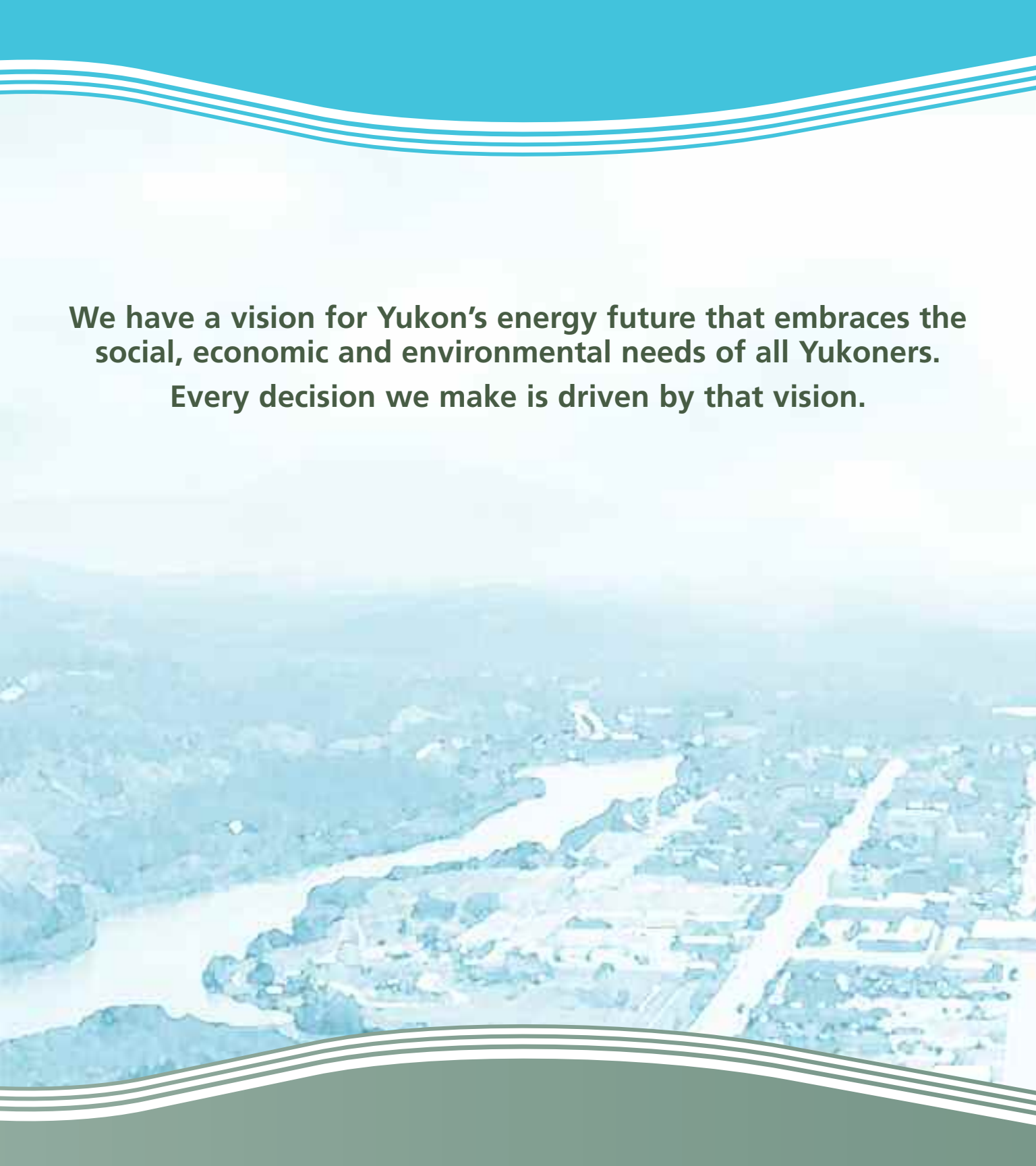
left to right
Mayo A generating plant; Mayo Lake control structure; Mayo A generator

We have a vision for Yukon's energy future that embraces the social, economic and environmental needs of all Yukoners.

Every decision we make is driven by that vision.



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Yukon Energy provides reliable and cost-effective energy services for customers throughout Yukon.

photo: www.archbould.com

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