KATIVIK REGIONAL GOVERNMENT AND ITS FIBRE OPTIC NETWORK PLANNED BETWEEN KUUJJUAQ AND KAWAWACHIKAMACH

THE NORTHERN VILLAGE OF KUUJJUAQ
JUNE 20, 2023

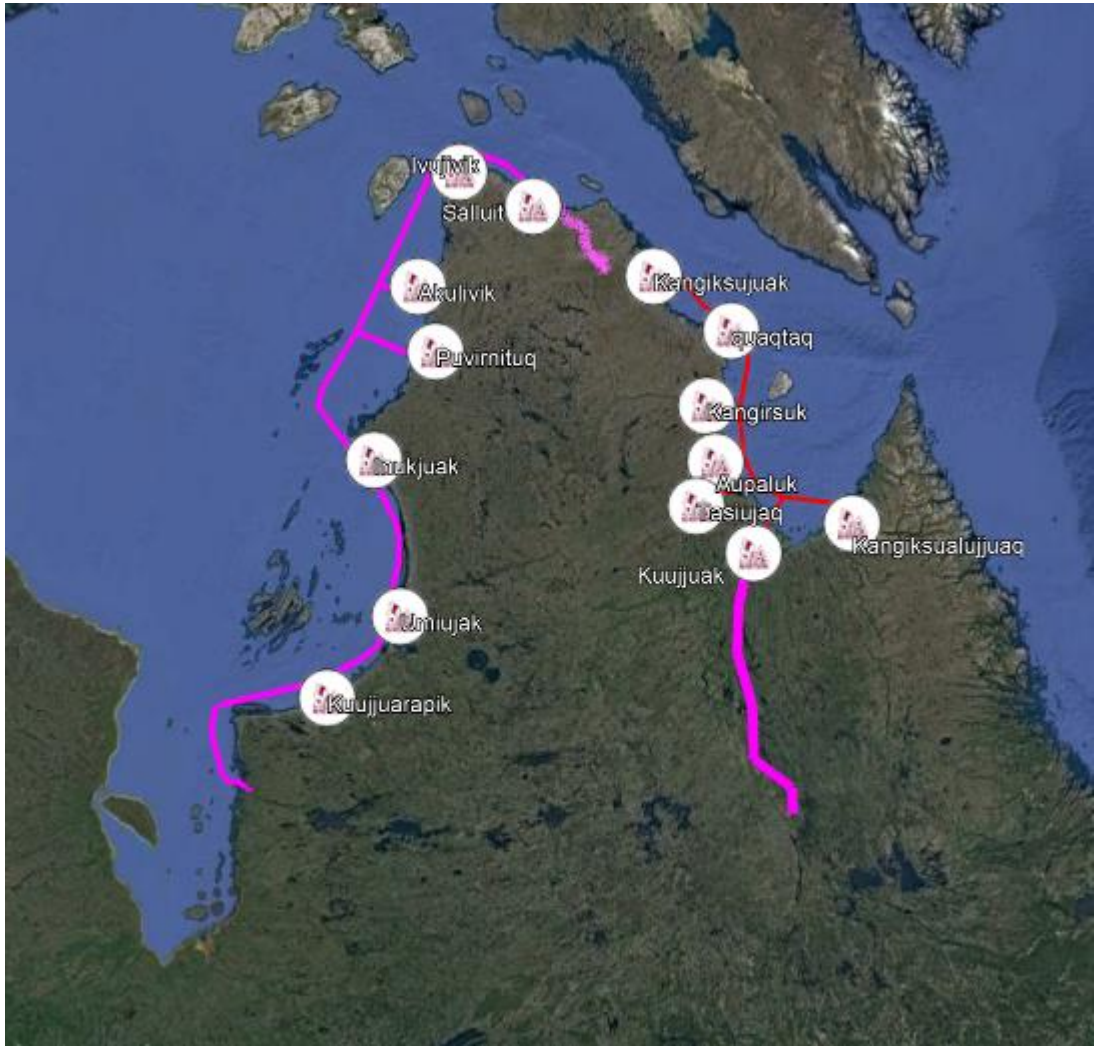
KRG EAUFON PROJECT

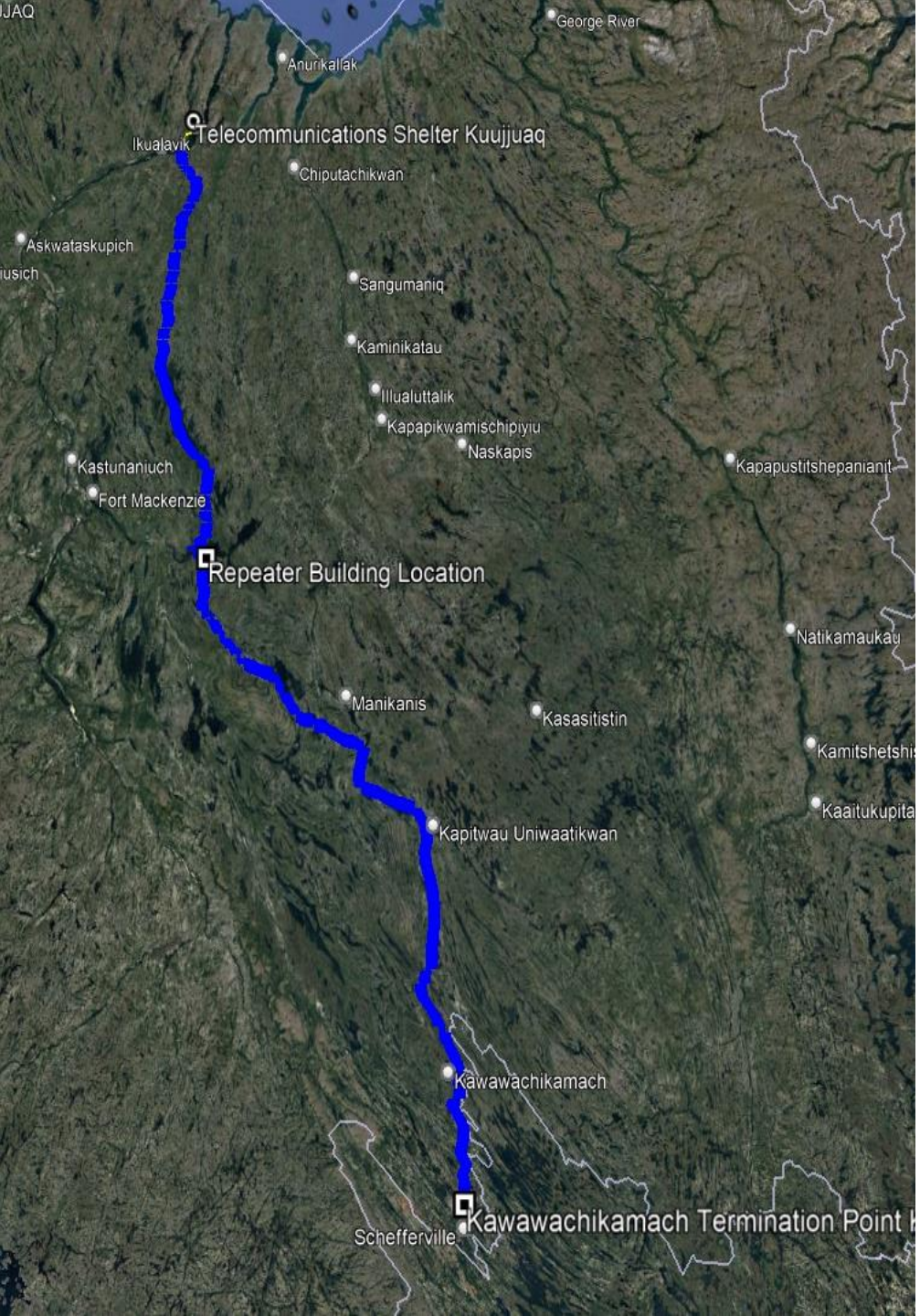
In 2019 KRG began the Project known now as EAUFON (Eastern Arctic Underwater Fibre Optic Network) to connect the Nunavik Communities with a reliable, dependable, and affordable High-Speed Fibre Optics connectivity.

The Fibre project consists of:

- EAUFON 1 (Completed 100%), undersea fibre from Chisasibi to Puvirnituq connecting the communities of Whapmagoostui, Kuujjuaraapik, Umiujaq, and Inukjuak.
- EAUFON 2 (Completion date: November 2023), undersea fibre from Puvirnituq to Akulivik, Ivujivik, Salluit, Deception Bay, Kangiqsujuaq.
- EAUFON 2 (Anticipated completion date: June 1, 2025, A terrestrial fibre cable route from Deception Bay to Kangiqsujuaq and a terrestrial route from Kuujjuaq to Kawawachikamach.
- EAUFON 3 (Anticipated start date: July 2025), Undersea marine cable connecting from Kangiqsujuaq to Kuujjuaq with connectivity to Quaqtaq, Kangirsuk, Aupaluk, Tasiujaq, and Kangiqsualujjuaq.

At Chisasibi and Kawawachikamach, the fibre cable connects to the partner networks (Eeyou Communications and Sichuun) for connectivity to the internet. This creates redundancy for the communities in case of a fibre break.



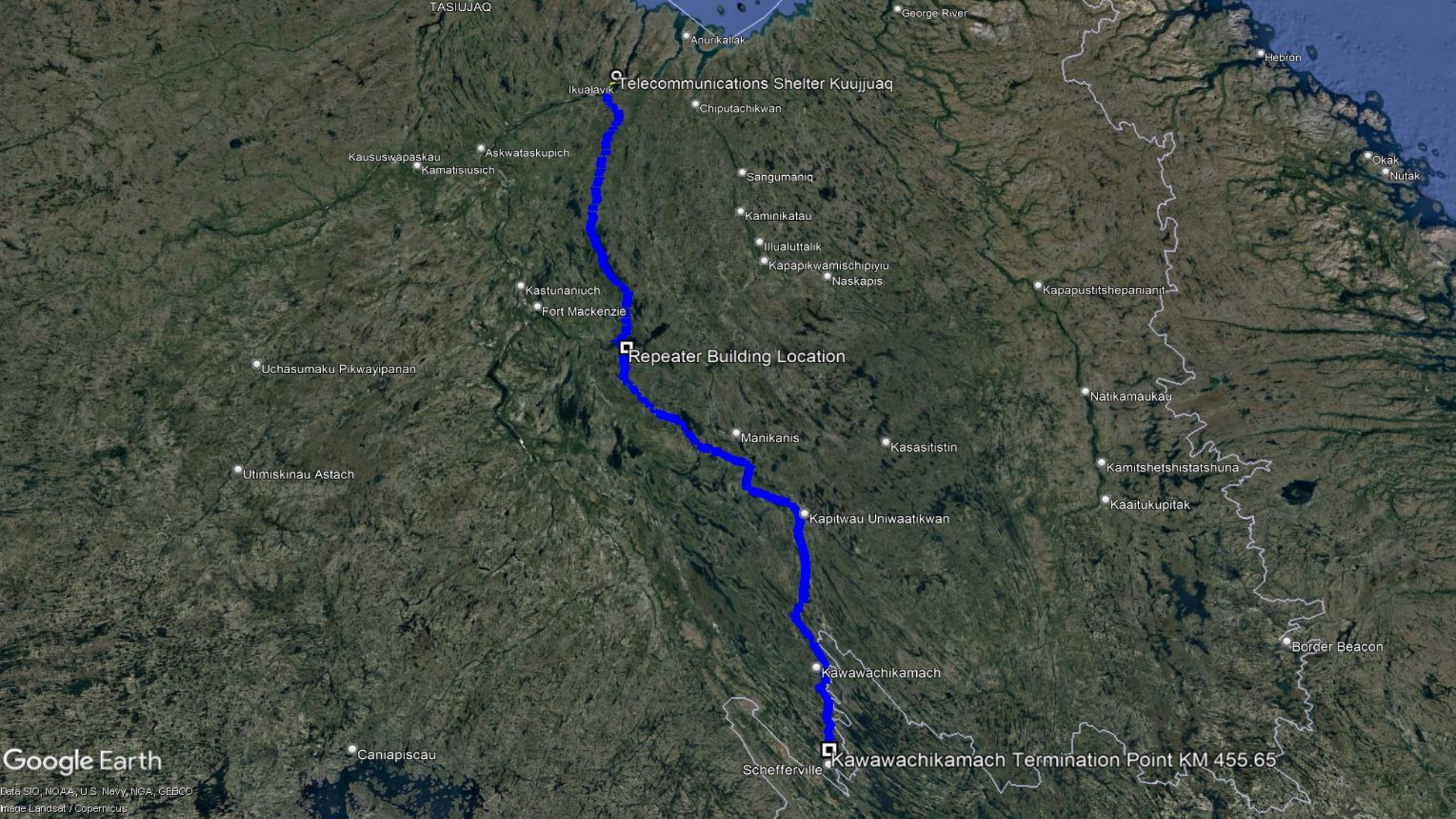


KUUJJUAQ TO KAWAWACHIKAMACH

This presentation focuses on the Kuujjuaq to Kawawachikamach portion.

The Kuujjuaq to Kawawachikamach route was designed and planned using various methods of study. The following were done in preparation to create the route:

- a 4-person crew travelled the route over a 3-day period to find the most accessible route.
- KRG project management team flew over the route at low altitude in a helicopter on 2 occasions.
- 32 technical route studies to find the ideal topographical & and geotechnical routing.
- All available high resolution satellite imagery and information was used in preparation and for selection of the route.
- Various discussions and communications with Provincial environmental agencies to ensure the route is not in breach of any environmental regulations.


TASIUJAQ
George River
Anurikallak
Hebron
Telecommunications Shelter Kuujjuaq
Ikualavik
Chiputachikwan
Kaususwapaskau
Askwataskupich
Kamatisiusich
Sangumaniq
Okak
Nutak
Kaminikatau
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Naskapis
Kastunaniuch
Fort Mackenzie
Kapapustitshepanianit
Repeater Building Location
Uchasumaku Pikwayipanan
Natikamaukau
Manikanis
Kasasitistin
Utimiskinau Astach
Kamitshetshistatshuna
Kaaitukupitak
Kapitwau Uniwaatikwan
Border Beacon
Kawawachikamach
Caniapiscau
Schefferville
Kawawachikamach Termination Point KM 455.65
Google Earth
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus

HOW DO WE BUILD IT

From the onset of this project, KRG has approached this with the mindset of minimizing the environmental impact and the disruption to the people that use this land as a way of life.

Through discussion and analysis it was determined that the best way to install the cable was the following:

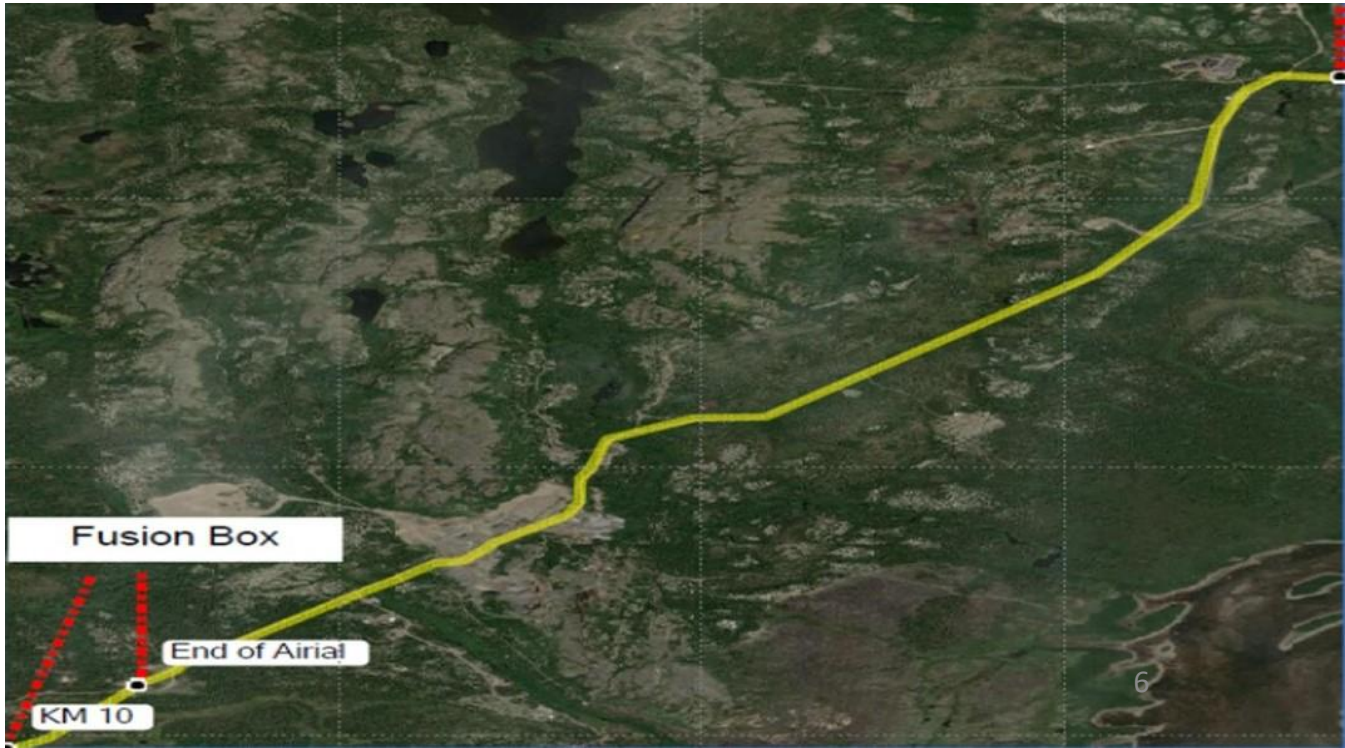
- Use existing natural corridors in wooded areas that reduce the need for tree cutting.
- Placing the cable along eastern leading edges of waterways in shallow water. Minimizing interference on existing habitats, fish, wildlife.
- Execute the work during winter months (snow on the ground, lakes frozen over)
- Use snowmobiles and traditional snow type equipment i.e., snowcats, Cat-Trains, sleds, etc.

KUUJJUAQ TO THE KOKSOAK RIVER

The Fibre Optic cable will begin in the existing telecommunications shelter in Kuujjuaq. It will then follow the existing telephone poles (Aerial)for approximately 9.54km until reaching the end of the existing line.

The cable, once reaching the end of the pole line, will then travel on the ground outside of Kuujjuaq until it reaches the crossing point of the Koksoak river.

To pass across the river it was decided to instead pass completely under the river by way of Horizontal directional drilling. This HDD Method has the minimal impact on Habitat, wildlife, fish, and users of the Koksoak river in their everyday life.



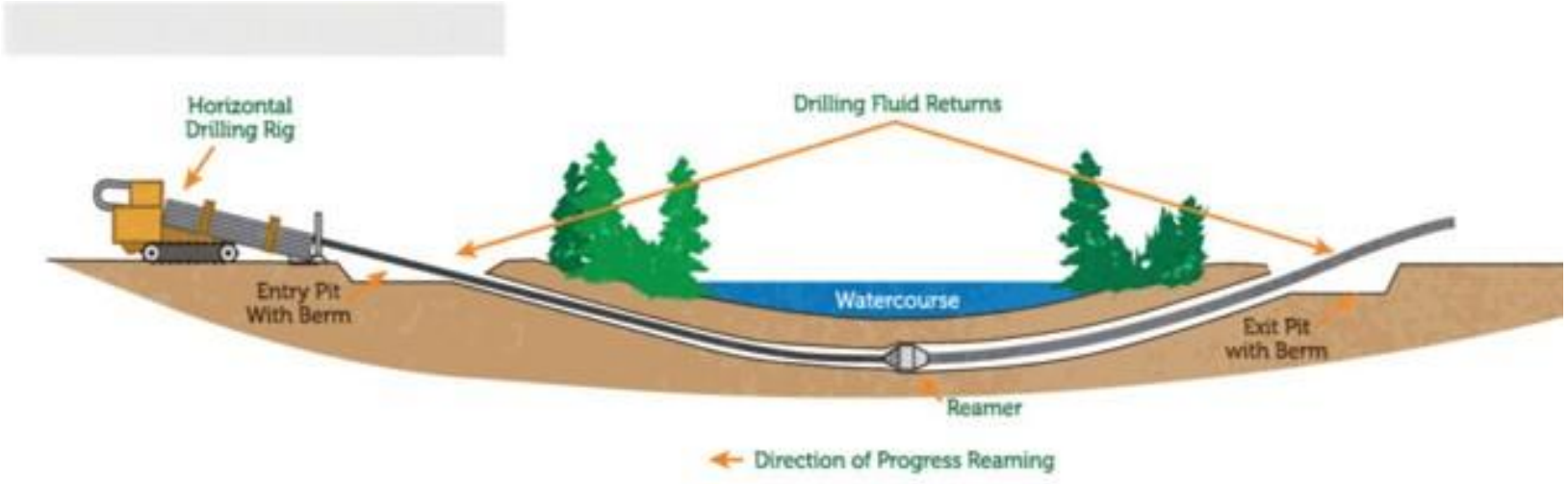
CROSSING THE RIVER WITH HORIZONTAL DIRECTIONAL DRILLING

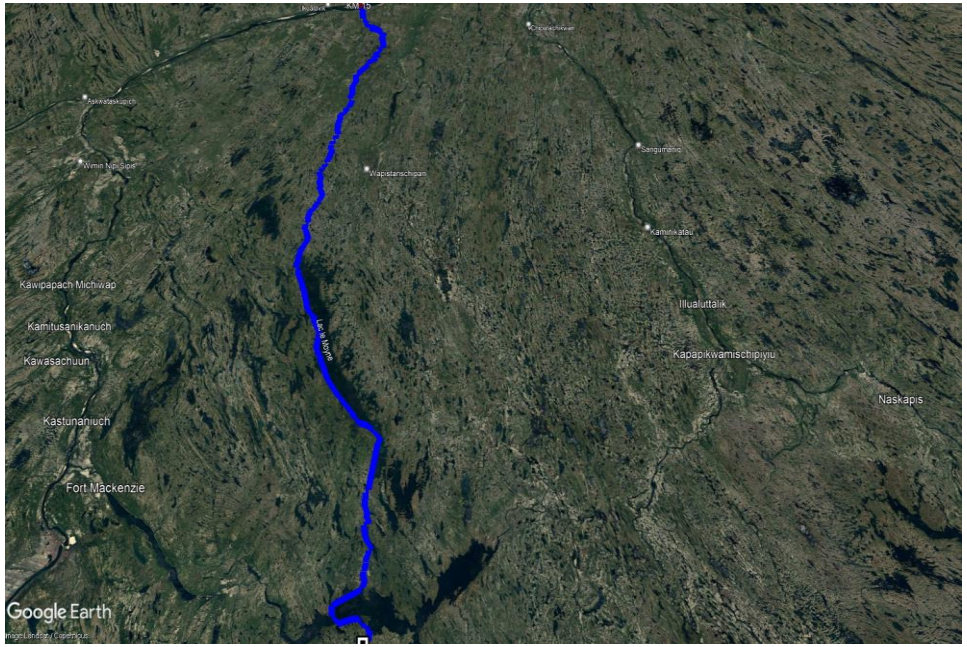
Using the same approach as the Cable installation. KRG has chosen a proven method for taking the Fibre Optic Cable under the Koksoak river, minimizing impacts on existing habitats i.e., Fauna, Flora, Fish, & Wildlife, as well as those who use the river as part of their daily lives.

A drill placed 30 metres from the shoreline will bore a 65-millimetre hole (2.5”), 10 metres below the bottom of the river, and exit 30 metres on the opposite side.

The cable will then be inserted into this bore hole and connected to each end of the terrestrial cable previously installed.

This method is by far the safest and most environmentally friendly means to cross the river versus laying cable directly on the bottom of the river or potentially installing towers to hang the cable above the river.





KOKSOAK RIVER TO THE REPEATER SHACK

The portion of the Fibre Optic cable route from the Koksoak river to the repeater shack will span 185km of both terrestrial and marine installation. This installation will be done only in the winter season when snow is on the ground and lakes are frozen over.

Across the 185 km, 107 km will be submerged under water less than 30m meters from the shoreline on the western side of the bodies of water. The goal is to ensure that habitat, wildlife, and people who use that area in their everyday life, are minimally affected by the presence of the cable.

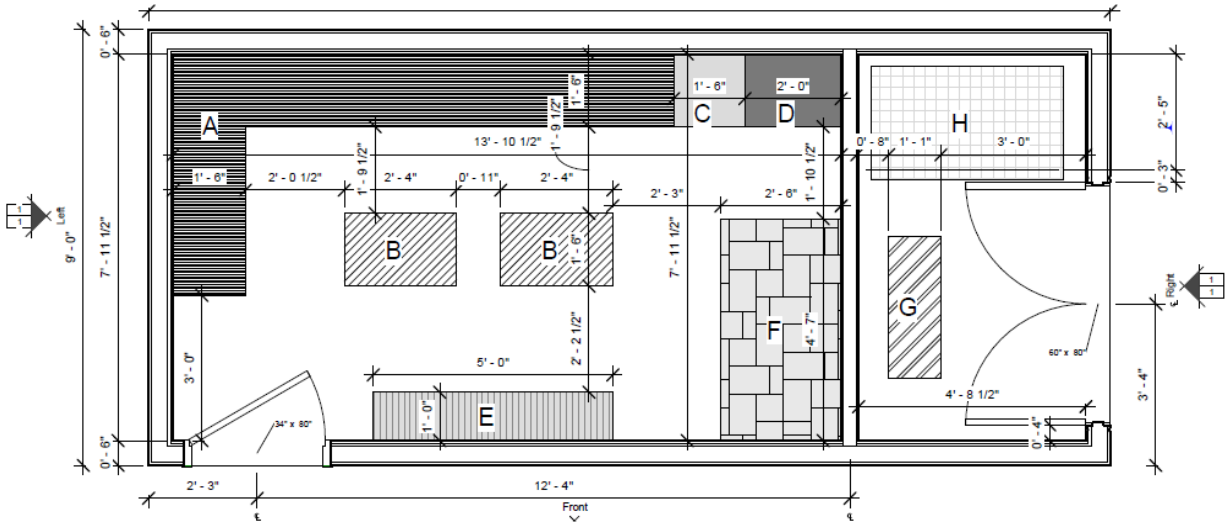
During installation, the Cable going into the water shall be placed on top of the ice and will then sink to the bottom of the water once the ice has thawed. In the early summer the installation team will return to ensure the proper placement of the cable at the bottom of the lakebed.

REPEATER SHACK

A repeater shack is installed at about the halfway point of the route to amplify the signal for peak performance.

This shacks design and location, was chosen based on the best placement to minimize impact on habitat, fish, wildlife, human activity and to ensure the best performance for the fibre link.

The building is self sufficient with solar panels installed on the roof; batteries capable of 30-days sustainability. A small generator with a self-contained fuel tank will serve as back up to charge the batteries in the case where the solar has been unable to maintain the battery charge. Fuel required for this generator is minimal and will be transported to the site via snowmobile or in the summertime via helicopter Fuel barrels will not be left on site (brought in, brought out).



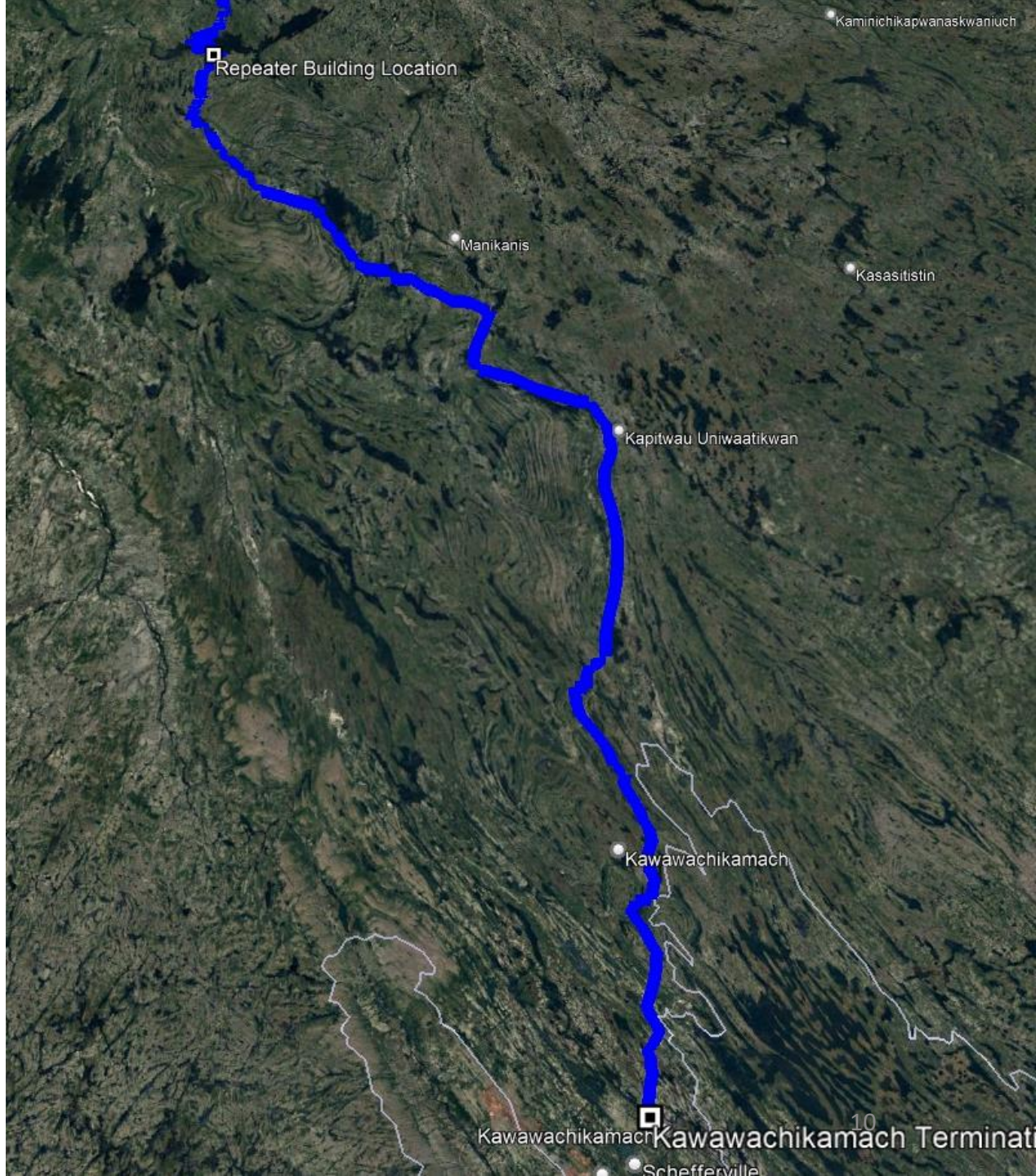
REPEATER SHACK TO KAWAWACHIKAMACH

Leaving the repeater shack the Fibre Optic cable will travel 250 km to reach its termination point in Kawawachikamach.

On the terrestrial portion 5-metre-wide path will be created for the cable by minimal tree cutting ahead of cable laying. The cable shall lay on the left side of the route with marker signs at each kilometer throughout the entirety of the route. These markers will be minimal in size to ensure minimal impact on the habitat, wildlife, and users of the land.

The cable route is designed keep the cable off, as much as possible any existing snowmobile trails.

Where possible the Cable shall be covered with overburden in an attempt to have as little visual impact on the land. It is anticipated within 2-3 years that the existing terrain will overgrow, and the cable will no longer be visible at all.



ENVIRONMENTAL STEWARDSHIP

KRG understands the vital role it must play and needs to play to ensure the protection of the valued environment of the Nunavik Region.

The KRG project team are working with Federal, Provincial, Regional and local agencies to ensure conformity to all environmental legislation, laws, and regulations. KRG has shared the cable route, the installation methodology and the mitigation efforts.

These will be applied to ensure the Fibre Optic cable leaves a minimum footprint on the local environment ensuring that wildlife and people's activities are not adversely affected by the cables presence.

Fibre Optic vs Starlink

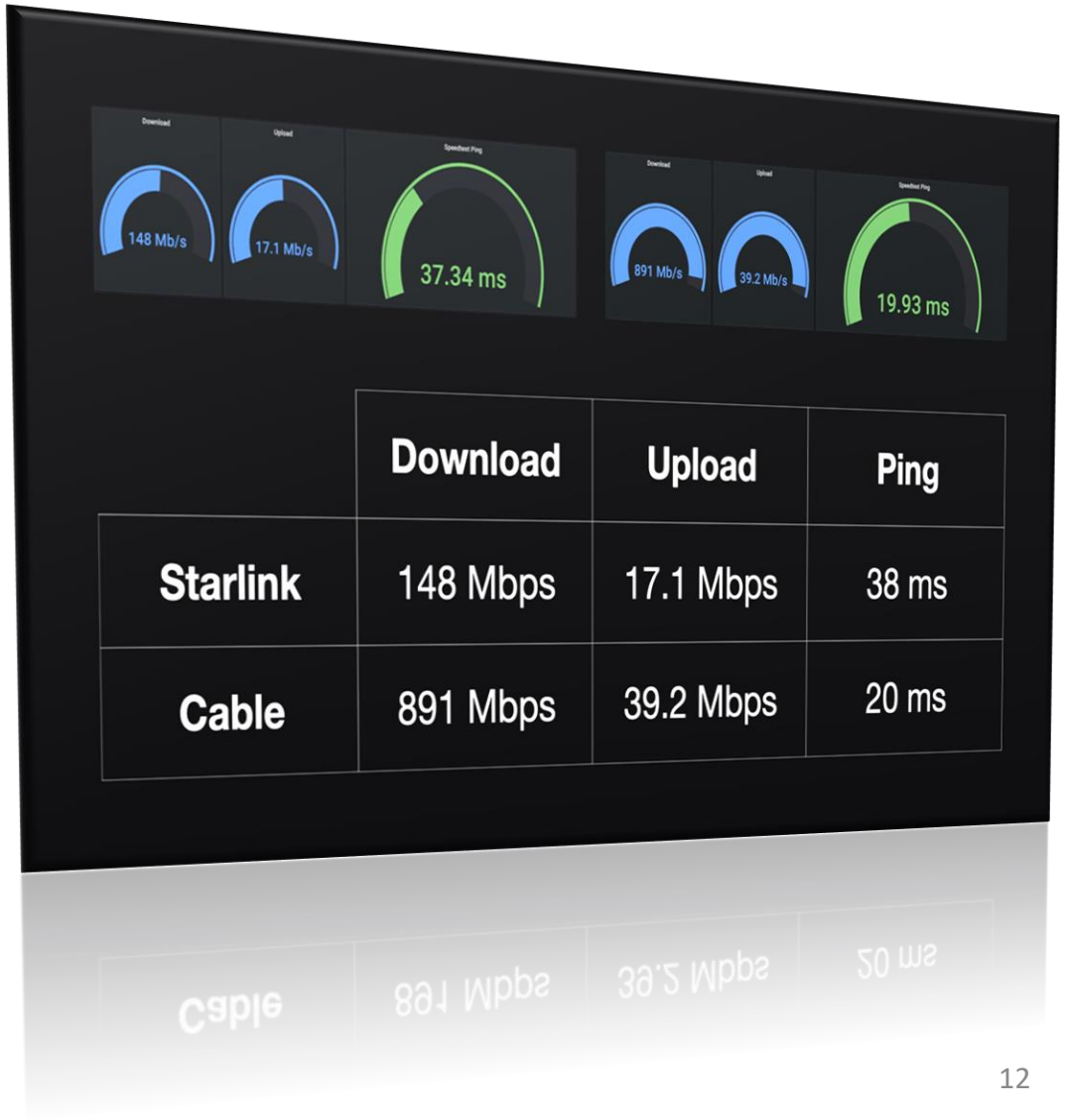
Although Starlink has attracted a great deal of attention recently and is filling the gap with much needed bandwidth, it is not considered to be the preferred long term option to provide broadband access.

One of the primary issues is that there is a capacity limit due to the number of satellites and the allocation of spectrum. The uplink capacity is much lower than the downlink capacity.

EAUFON fibre is designed to cover the bandwidth needs of Nunavik for a minimum of 25 years.

As the fibre downlink and uplink capacity is the same, this opens up extremely high throughput applications where bandwidth is needed in both directions.

Tamaani internet will have differently priced packages that fit with the needs of users.



WHY FIBRE?

With the implementation of a Fibre Optic cable bringing more dependable and reliable broadband/internet into Nunavik, it will broaden opportunities and open doors currently closed as a result of slow and unreliable connectivity. The results of Fibre positively impact:

- The Social value
- The Economic value
- The Medical value
- The Educational value

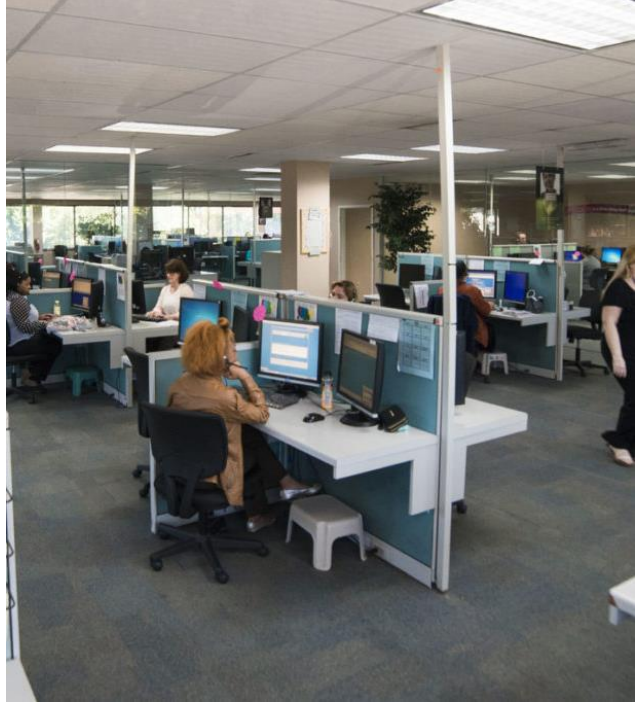
As a result of high-speed broadband internet, it will bring about improvements for the people of the Nunavik Region.

No longer will accessing the internet be faster or slower depending on the time of day or how clear the skies are. Instead, the speed of the internet will be faster than ever and remain constant regardless of outside forces.

THE SOCIAL VALUE

With high-speed Fibre Optic internet access being made available to everyone in Kuujjuaq the ability to access websites or surf the worldwide web for social use will be equal to what the rest of the world has taken for granted for many years now.

From connecting with family via FaceTime or other video calling services to streaming services, unlimited access will now be available without the inconveniences of freezing, loading time, waiting or dropped services. Instant, reliable, and dependable access is what makes a hardline Fibre Optic cable the solution Nunavik.



THE ECONOMIC VALUE

Dependable, reliable broadband/internet service will create numerous opportunities for the people of Nunavik. The ability for existing businesses to expand the potential for new businesses to open, become equal to those markets in the southern parts of the country. Some of these opportunities include:

- Ecommerce
- Arts & Culture
- Customer service call centers
- Customer reservation centers

These types of businesses which are traditionally seen and experienced in other areas of the globe now become possible for Nunavik, now that the Fibre Optic high-speed internet gives equal opportunity regardless of the geographic location.

THE MEDICAL VALUE (Tele-Health)

One of the most challenging aspects of living in Nunavik is access to swift medical services. The requirement to often travel long distances for simple consultations or everyday health and welfare needs can be significantly mitigated through the use of secure, reliable, and dependable telemedicine. This evolving and growing trend in health and welfare care will only continue to expand. With dependable, reliable high-speed broadband/internet it will make it simpler and more accessible for people to access online doctors' appointments, physiotherapy, therapy, consultations and any other medical needs.

No longer will anyone be restricted from meeting with a medical professional for a quick checkup because of the reduced internet speeds available in their communities

Fibre Optic will help to guarantee and improve the quality of life in Nunavik.

THE EDUCATIONAL VALUE (Tele-Education)

Education is crucial to the development and growth of the youth. Access to reliable & dependable broadband/internet will provide an additional tool to schools, teachers, and parents ultimately increasing the quality of learning for the children in all communities throughout Nunavik. Children and young adults will have better access to learning tools available on the internet. Teachers will have greater resources to help teach the students. Additionally, online services and specialists will become more readily available to school administrators, teachers, and parents to provide necessary assistance to children with special needs or learning difficulties.

The emerging availability of continuing education through CEGEP, University, or specialty trade schools will increase the opportunities for the youth of the Nunavik to obtain the same degree of higher learning as their counterparts in southern areas of the country. This opportunity will also afford Nunavik youth with the potential to remain in their communities and ultimately contribute back what higher learning has provided them.

Government services and existing businesses will equally benefit from access for their employees to continuous learning, keeping Nunavik's work force at the cutting edge of evolving technologies, services, and training. This in turn ultimately benefits everyone.

Thank you!