

NORTH CARIBOU WTP CASE STUDY

Background

Komline Pure Water Potable Water Treatment Plant Commissioned for First Nation Community in Ontario

OVERVIEW

Komline Pure Water Canada commissioned a custom Water Treatment Plant for the North Caribou (Weagamow) Lake First Nation Community in 2023. The Weagamow (Round) Lake acts as the primary water source for locals whom in 2020, were officially placed under Boil-Water Advisory. Affecting approximately 948 residents and 230 homes, the Native Band partnered with Indigenous Services Canada to fund a feasibility study that determined the need for a water treatment plant upgrade and expansion. The project was specified to supplement the Hamlets' existing treatment system by up to 90%, increasing overall water volume and quality. Although only intended as a 3-5 year temporary intervention, the 53ft containerized system has the potential to serve as a long-term water treatment solution; built with superior technologies and durable, weather-resistant materials.

Client

JR Cousin Consultants -
Winnipeg, Manitoba

Technologies

A combination of pre-filtration, direct Nano-Filtration, UV disinfection and chlorination processes

Application

Surface Water Treatment for Potable Use

Location

North Caribou, Ontario,
Canada

Scope

Directly awarded to provide design, fabrication, commissioning and operator training

OBJECTIVES

Komline Pure Water was challenged to design a water treatment system that;

- **Meets all Canadian and Ontario Drinking Water Standards**
- **Is simple, effective and easy to operate**
- **Involves minimal chemical handling**
- **Is cost effective and weather durable**

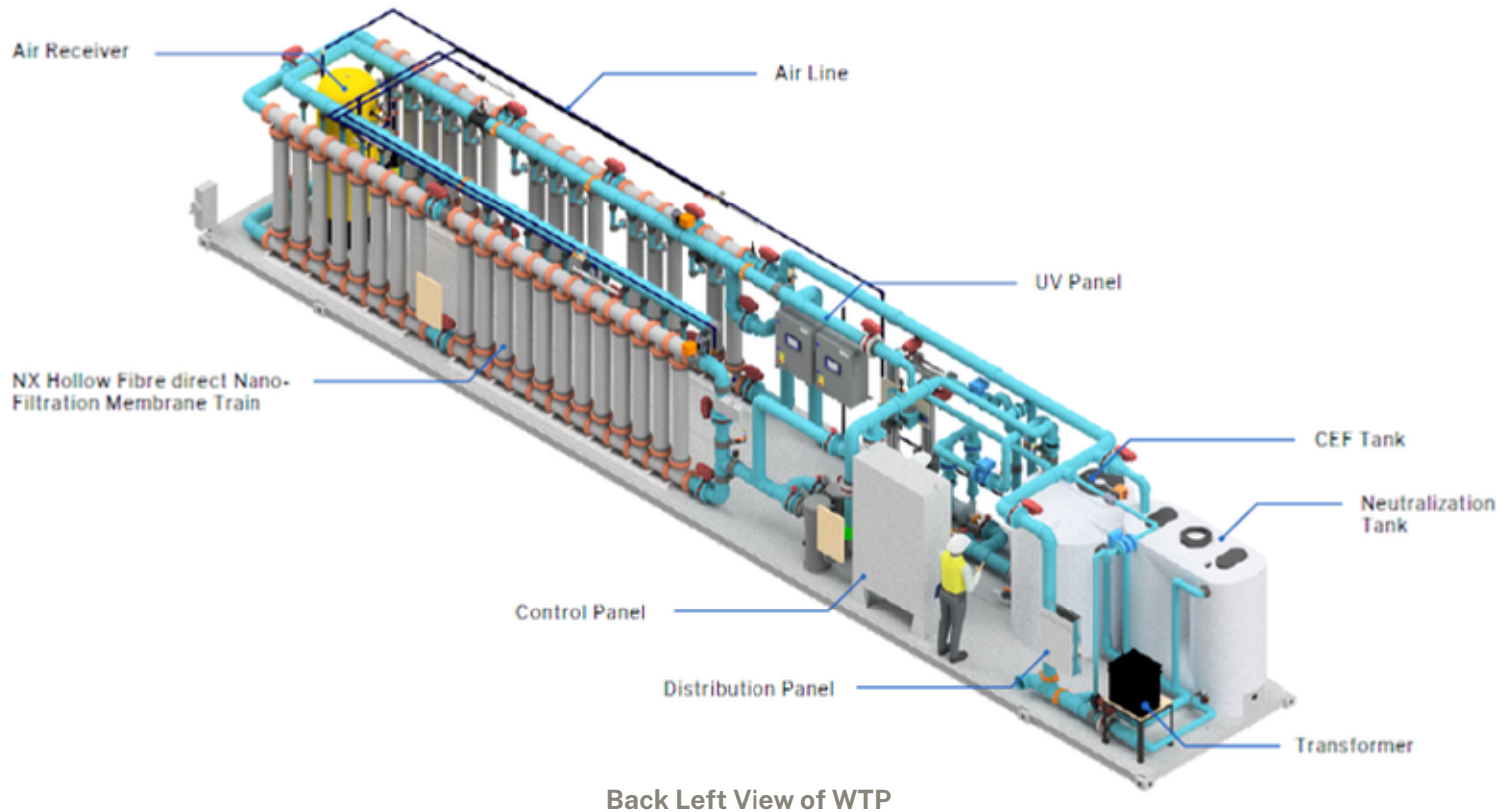
SOLUTION

- **Modular building houses the system, complete with heating, insulation, lighting, and ventilation**
- **A four-step treatment strategy that includes pre-filtration, direct Nano-Filtration, UV disinfection and chlorination processes**
- **A fully automatic CEF (chemical enhanced flushing) process**
- **Onsite plant commissioning and local operator training**
- **PLC-based automated control system with HMI enables, remote monitoring capability, alarms, and to support local operators.**

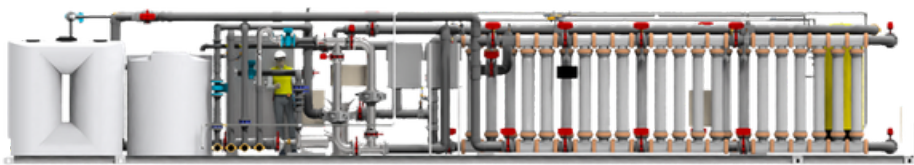


We're proud to have our dNF Hollow Fiber Membranes feature in this great drinking water project in Canada."

-NX Filtration



Back Left View of WTP



Inside of the Water Treatment Plant



Right Side View

PROCESS FLOW

Raw water from Weagamow Lake enters the Packaged Treatment System through four outlets at a flow rate of 130–150 USGPM.

In the first of four treatment stages, water passes through a Forsma motor-driven self-cleaning filter. Its 100-micron screen removes larger contaminants and debris before direct Nano-Filtration.

An NX Hollow Fibre membrane system (dNF), certified to NSF/ANSI-61 and Kiwa standards, provides a one-step process that replaces conventional UF/NF methods. It reduces capital and operating costs while removing colour and organics. The system also eliminates the CIP process, replacing it with fully automatic CEF flushing.

The dNF system combines UF and NF in a single membrane configuration, offering a simpler, more cost-effective solution for small communities.

Two Evoqua ETS-UV systems disinfect the water by inactivating bacteria, viruses, moulds, and chlorine-tolerant pathogens. UV treatment improves taste, colour, pH, and odour, while automatic cleaning and dosing pumps manage treatment chemicals.

A final chlorination stage removes remaining harmful bacteria before the purified water is transferred to a reservoir for municipal use.



Our Process in Action with
 Advanced Water
 Purification .
 Raw vs. Treated Water



BEFORE

AFTER



Buildings are prepped and fabricated with insulation, walling, painting, ventilation and heavy duty flooring materials.

Head Project Manager provides Komline Pure Water staff with a plant walkthrough during the project build.

Engineers and Shop Team come together to complete final phases of fabrication and prepare the plant for shipping to site.

FABRICATION

A smart modular-build solution, the modified steel shipping container was custom designed to include an insulated heavyduty swing door, convenience lighting and electrical receptacles, thermal insulation and weather sealants (to withstand the harsh sub-zero winter temperatures in the region), and chemical resistant wall and floor coatings. Building occupancy defined by the National Building Code of Canada (NBC) is Group F, Division 3. The building also holds a CSA A277 certification that complies with technical standards for prefabricated buildings and modules in Canada.

Our in-house fabrication capabilities are supported by CSAA660 certification by the Canadian Welding Bureau (CWB), and our electrical and control panels are certified by ETL. All welding, plumbing, electrical and Factory Acceptance Testing (FAT) procedures are completed at our manufacturing facility prior to shipping to site. This "plug and play" approach met our initial objectives by providing the community with a water treatment solution as fast as possible, with a total build time of approx. 22 weeks.

COMMISSIONING

Once completed, the 36,000lb Plant is craned and loaded onto a specialized truck that transports it for approx. 4345km to its final destination in Ontario. Our dedicated Service Team and Project Engineers visit the site multiple times during the commissioning period to ensure that installation, integration and start up processes are met according to the Quality Management Plan (QMP), including a 3-day comprehensive system performance test.

Due to their fragility, the thirty-five NX Hollow Fiber membranes are separately transported in from the US in a temperature controlled fluid. An HMI Siemens Control Panel provides automatic plant operation (with manual over-ride functionality), manufactured and programmed in-house by Komline Pure Water experts. The panel includes a logic controller, local H/O/As, ethernet and a CSA approved NEMA 4 enclosure.

KOMLINE PURE WATER

Komline Pure Water has been designing, fabricating, and commissioning custom water and wastewater treatment plants for over 30 years. Headquartered in Surrey, British Columbia, our engineering and manufacturing teams specialize in delivering high-performance treatment systems & plants for municipalities, Indigenous communities, industrial facilities, and remote locations across North America.

Our modular, **pre-engineered surface water treatment plants** convert challenging raw water into safe, reliable drinking water using advanced filtration, membrane treatment, UV disinfection, and chlorination. Fully assembled, factory tested before shipment, each system minimizes installation time while ensuring dependable long-term performance. Designed for resilience, our treatment plants withstand harsh environments and support remote operation, providing sustainable potable water solutions for communities across North America.

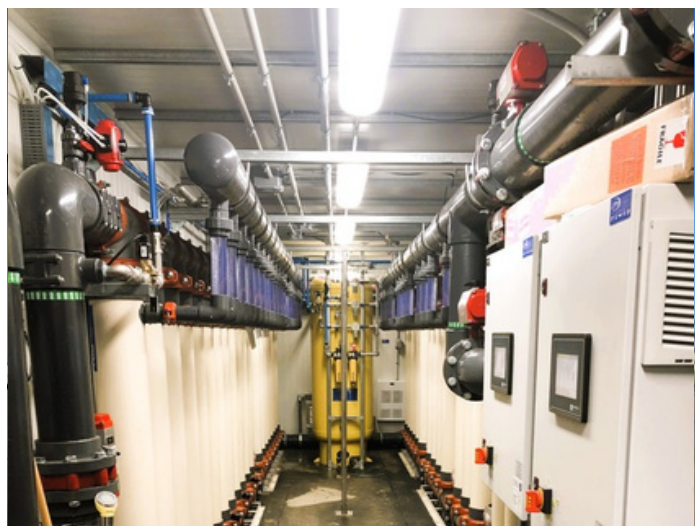
Planning a potable water treatment project? **Contact Komline Pure Water** to discuss your application and discover how our modular treatment solutions can deliver safe, reliable drinking water for your community.



NX Hollow Fiber dNF Membrane Train installed and connected on site.



Inside of the Water Treatment Plant



Recent Photo From Water Treatment Plant