

# Baker Lake, Nunavut

*September, 2012*

A water treatment plant and dual truckfill system for the Government of Nunavut was installed in Baker Lake in August 2012. The only Inuit community located away from sea water, Baker Lake has approximately 1900 residents at certain times of the year. Visitors and construction workers add another thousand people in summer.



*The water treatment plant and backwash tank viewed from the lake. Dual intake lines are shown at center*

The fresh water source is surface water from the lake. Being North of 64 degrees latitude, the lake is frozen more than 8 months per year, so turbidity is normally low. During the many windy summer days the lake water can have high levels of sediment and dissolved minerals.

The 6M wide x 28.6M long package water treatment plant (WTP) was shipped in four modules, then bolted together on site. The pump system was designed to deliver up to 1,200 L/min (72 m<sup>3</sup>/hr) of raw water from the lake to the plant. The WTP has systems for media filtration, ultra-violet irradiation and chlorination.

In more detail, the truckfill plant utilizes four parallel silica sand filters to allow backwash-

ing of one while the others filter water, two parallel UV units for redundancy and a calcium hypochlorite dosing system. The chlorination system is designed for injection both before the water storage tank and into the distribution lines to the truckfill arms.

Auxiliary equipment in the plant includes 3 boilers, inside fuel tank, glycol heating system, heat recovery unit, diesel generator, battery bank and a motor control center (MCC).

The fuel tank, welded filter backwash collection tank (4.9M high x 6.1M dia.) and the welded treated water storage tank (7.3M high x 8.1M dia.), are located outside the truckfill building. The tanks are equipped with heat transfer coils. The utilidor pipelines and access vaults are used to transfer water to the Health Centre and the Seniors Centre. This saves hauling water to these two locations.

The truckfill operation can be manual or fully automatic, in the latter case controlled by the PLC based on HMI touch screen input.

## CASE STUDY

BI Pure Water also installed its “Remote Monitoring and Trending” system in the plant. The system provides alarm reporting and data monitoring as well as trending of important parameters such as chlorine level, pressure differentials, pump speeds, flow, alarms and



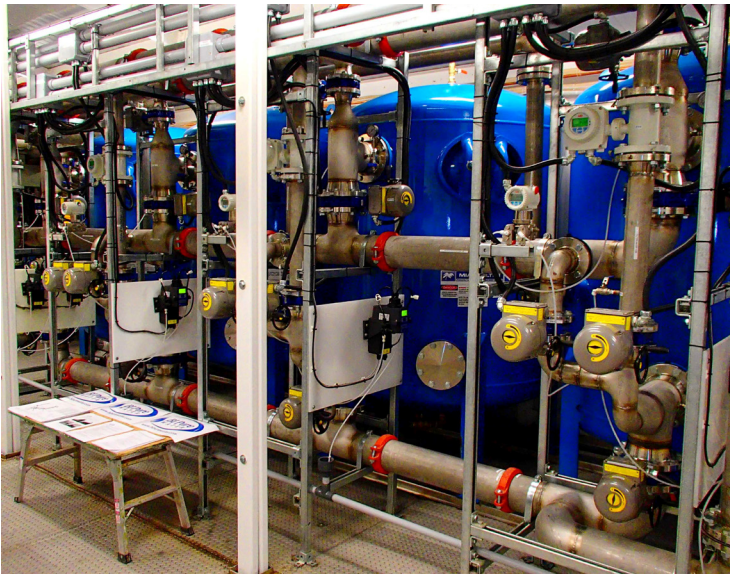
*North side view of the water treatment building, truckfill arms and backwash tank during winter operation*

outputs from the turbidity and chlorine analyzer instruments. This information is available on computer screens in Baker Lake, and at the company’s offices in Surrey. Ongoing training is the result, with BI Pure staff available to help the operator diagnose problems in real time.

BI Pure Water (BIPW) specializes in reviewing water quality test results and prescribing the most cost-effective solution. BIPW engineers pilot, design, manufacture, install, start-up and commission package water treatment plants. The operators are then trained and the plants can be serviced on a regular basis. BIPW focuses on small and medium-sized water treatment plants to meet the needs of federal, provincial and municipal governments, industrial, mine camps, private water systems, resorts and First Nations.

BI Pure Water specializes in custom engineered treatment systems:

- Years of water engineering expertise: electrical, mechanical and civil engineers specializing in water treatment on staff
- Custom designed to a specific water analysis and budget
- Systems are leak and flow tested at the factory, the PLC is operated and debugged before shipping for faster installation and start-up on site, lower total cost
- We don’t sub-contract
- Complete design, build, install, parts, service



*Four parallel media filters use silica sand for filtration of particles. Turbidity meters monitor the water.*



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