

Best Practice

Logan Green Water Management System

CONTACT

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THE PRACTICE

In 2004, it became apparent the existing water supply system could no longer meet Yorkton's growing needs. The four existing water-treatment plants were scattered throughout the city; none were connected to each other or to all 14 wells. The city needed a new, high-output treatment facility.

The Yorkton 2020 Strategic Plan promotes environmental responsibility, sustainability, and stewardship including recycling, water and energy conservation. The Logan Green Water Management System meets these goals, ensuring a 25-year water supply for the city while creating significant public green space for residents.

At \$33 million, this is the largest municipal project in Yorkton's history. It incorporates the latest technology in water treatment plus innovative, green ways to handle the backwash water generated from regular flushing of the filters in the treatment system.

THE PROCESS

The area was zoned as environmentally sensitive due to the shallow aquifer that underlies most of the study site. The objective of this project was to develop a cost-effective and environmentally responsible system to treat, dispose of, and re-use process backwash water generated at the water treatment plant.

The city had money set aside to finance it, and found cost-sharing resources available from federal and provincial sources, including the Federation of Canadian Municipalities' Green Municipal Fund. Multiple departments – public works, community development, parks and recreation, fire protective services, planning and engineering, and finance – were actively involved. Together, they developed a long-term infrastructure plan including water, sewer, roads, walking trails, bike paths, a fire department training centre, and facilities for future development. Consultation also included design and construction of the Logan Green retention ponds and sporting fields, and an education component on water conservation and treatment.

There was also widespread stakeholder and community consultation, and cooperation in planning and financing. All orders of government were involved, and many local organizations, including the Assiniboine Watershed Stewardship Association, Saskatchewan Wildlife Federation, Ducks Unlimited, Sunrise Health Region, and Yorkton United and FC Soccer Club.

THE RESULTS

At maximum capacity, the new plant can treat 22,000 cubic meters (22 million liters) of water per day. The 1,100 cubic meters (1.1 million liters) of backwash water produced daily will be treated through a series of settling ponds to purify it, before

recharging the natural aquifer. Normally, backwash water is flushed into the sewage system, where it substantially and unnecessarily increases the amount of water being treated in the sewage treatment plant.

The process is simple, virtually maintenance free, and environmentally friendly. It also provides the community with a space full of native plants, wildlife, and fish. Capital cost was approximately one-third that of the estimated cost for a conventional backwash water treatment system. Since the process removes the need for clarifiers and additional chemicals for treatment, operational costs are expected to be very low. Some \$3 million dollars was saved on infrastructure alone by using the settlement process and not building a lift station and force main. Operational savings in treatment and maintenance costs over the life of the plant are expected to total some \$6.3 million dollars.

The Logan Green Water Management System includes 210 acres of green space, as well as a stream, fish pond, and a natural pathway connecting the settlement ponds to the aquifer recharge area. Fish will soon be introduced into the stream and settlement pond system, to measure the sustainable quality of the filter backwash water system.

Consolidation of the water supply system to one location dramatically reduced logistics such as travel time and fuel consumption, compared to operating multiple facilities many kilometers apart. By having one facility, heating and energy costs are dramatically reduced as well as maintenance and operational costs.

Continuous monitoring of various aspects of the treatment process allows immediate response to changes in water quality. The new plant allows them to bring raw water in from any combination of 16 wells, into one treatment plant rather than specific wells going to one of four outdated treatment facilities. Treatment capacity has now doubled that of our old system.

The new computerized supervisory control and data acquisition system monitors and allows easy control of facility-based processes including wells, water treatment, distribution pumps, pumping stations, and the wastewater treatment plant. Automation also enabled the department to remove shift work. The new, higher classified plant means improved lab and automated systems, plus the opportunity for staff to gain the highest classification of certification in their field.

Excess fill from the construction of the water treatment plant and the backwash treatment ponds were used to create six multi-purpose sports fields. Fill from the aquifer recharge area was used to create a new commercial subdivision.

There are many environmental, social, and economic outcomes for the project. Water quality has improved substantially by increased removal of excess iron and manganese. New technology also allows them to reduce chemicals used in the treatment process of potable water. The new, greener system of filtering backwash water through the settlement pond system saves substantial infrastructure costs and allows them to reintroduce this water into the natural aquifer, rather than moving it to the sewage treatment plant. This reintroduced water will be part of the irrigation system for the six new multi-purpose sports fields.

LESSONS LEARNED

- The project is both suitable and adaptable for other water-treatment plants and can be used for ground- and surface-water treatment facilities. The key to successfully initiating a project like this is to invite all possible stakeholders – including community residents – to provide input on a conceptual plan.
- Community involvement is a key issue in getting support from all stakeholders and is of utmost importance when successfully planning and completing a large-scale project. Workshops generated a number of great study components and also generated enthusiasm for the overall project. Keeping the design simple and realistic allowed local contractors to bid on the project, while the project was executed using professional planners, engineers and hydro geologists.
- Strong project management, provided by the City of Yorkton Environmental Services, was vital to the project's success. All available financial funding was thoroughly investigated and it was decided that the project be divided into two phases. One phase consisted of the settling ponds, backwash water, and recharge area, while the second phase consisted of the sporting fields and walking paths. This kept all involved parties engaged in the group consultation process.