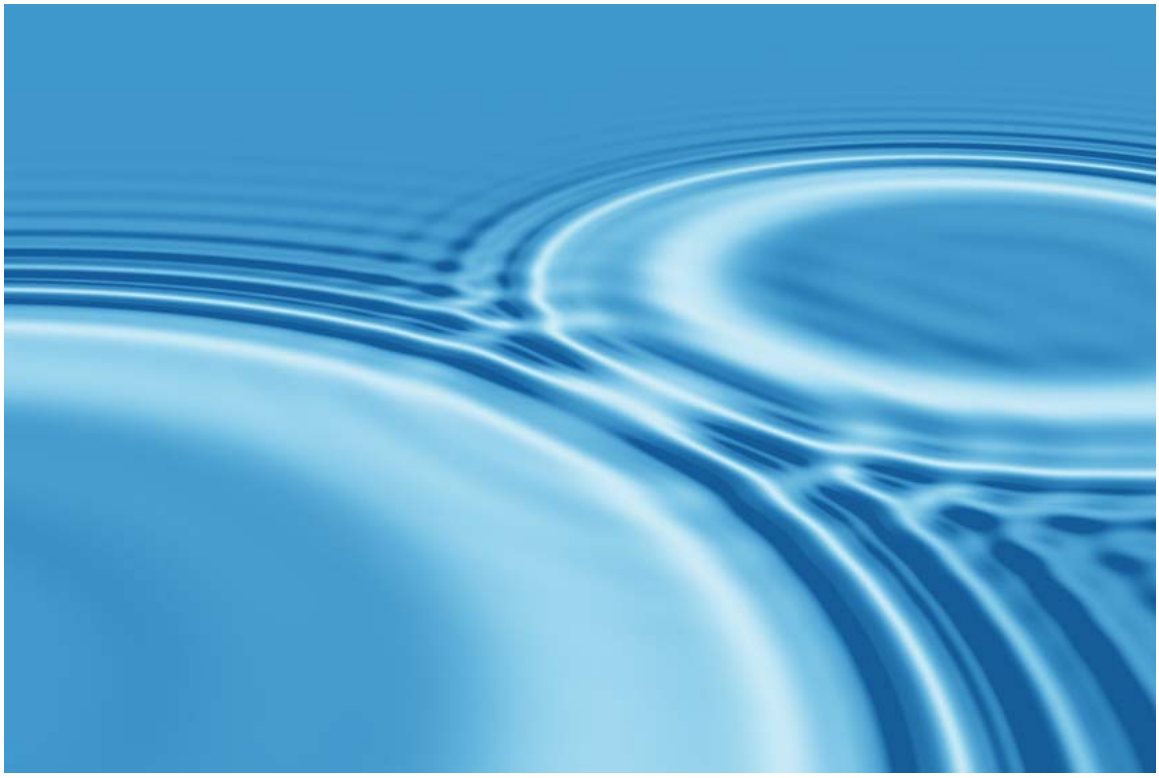
2010 UBCM Community Excellence Awards
Leadership & Innovation - Mid - Size Community

Effluent Water Re-Use Project



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Effluent Water Re-Use Project

Project Summary:

In 2008 the City of Dawson Creek commissioned an effluent re-use study, with a focus on the possibility of treating and reusing effluent from the City sewer system, for use in the oil and gas industry for non-potable water requirements. The oil and gas industry uses up to 20% of the treated, potable water produced by the City water treatment plant, primarily for dust control, hydraulic fracturing, drilling mud preparation and a small amount for the domestic potable needs of camps. The estimate is that 90% of the water is used for hydraulic fracturing and the possibility of using non-potable, treated effluent for this purpose could significantly reduce the use of expensive, treated potable water thus giving the City water treatment plant and the limited water source a longer effective lifespan. Currently the Kiskatinaw River is the only source of water for the City of Dawson Creek and surrounding area and by using treated effluent rather than high quality, treated potable water for hydraulic fracturing the City will be able to continue to grow until 2035 without the need for a new water supply or treatment facility, saving a significant amount money.

The study proved that the concept was feasible and that the 4,000 cubic metres of sewage could be treated to a standard acceptable to the needs of the oil and gas industry, for hydraulic fracturing, drilling mud preparation and dust control. The study confirmed that the technology is available to treat the effluent to remove particulate matter and to neutralize any harmful pathogens that could pose a health threat to the workers handling the water. The problem was the 10 million dollars needed to build the treatment plant. In February 2010, to address the need for private sector funding for the project, and after an industry open house and a public consultation, the City issued an RFP inviting proposals from the oil and gas industry. The proposals were reviewed and Shell Canada was the successful proponent. The City of Dawson Creek and Shell Canada are negotiating an agreement to build the effluent treatment facility with Shell providing the 9.75 million dollars and in return having access to 3,400 cubic metres of treated water from the plant per day. The additional treated water produced by the plant will be available for the City to sell for a potential revenue stream of $500,000 per year.

The project also includes Shell constructing a pipeline from the plant to the Shell gas field to carry water that would normally be hauled by truck. This will take up to 85 water trucks off the road, reducing the road congestion and greenhouse gas emissions.

The tender for the construction of the treatment facility will be issued this fall and construction is scheduled to begin later in this fall.

How does the program/project protect BC's environment?

There are a number of ways in which this project protects the environment:

- First of all, by treating effluent for industrial use, where potable water is not needed, the water supply of the City of Dawson Creek is protected, which in turn protects the Kiskatinaw River and extends the life span of the Dawson Creek water supply and water treatment infrastructure.
- Currently the effluent leaves the City sewer lagoon and enters what used to be a seasonal creek that would flow in the spring and after heavy rainfalls. Even though the effluent meets all of the environmental standards for release into the creek, the additional flow has changed the ecosystem of the and since this project will remove much of the effluent from the creek, it will eventually return to its original state.
- In addition to this project, it also includes the construction of a pipeline to carry the water to the Shell gas field thereby removing up to 85 trucks from the region's roads, reducing the carbon emissions and road congestion.

What steps are involved in the program/project and what is the status of each step?

There were 10 steps in the process of developing this project:

1. The City commissioned a feasibility study in 2008. Status: Completed
2. Develop and approve a work plan, December 2009. Status: Completed
3. Industry open house, January 2010. Status: Completed
4. Public consultation, February 2010. Status: Completed
5. Treatment process selection, February 2010. Status: Completed
6. Issue RFP, February 2010. Status: Completed
7. Receive proposals, make recommendation to council and send award letter to proponent, March 2010. Status: Completed
8. Detailed design of the project, March - July 2010. Status: In process
9. Issue the project construction tender - September 2010. Status: In process
10. Start construction, August - November 2010. Status: In process

How is the project relevant to current environmental issues?

Water conservation, reducing pollution, and greenhouse gas reduction are all very important environmental issues and this project relates to all of these topics. By reusing effluent, the City of Dawson Creek is conserving up to 20% of the treated potable water currently being processed in the water treatment facility.

By constructing a pipeline and limiting the need for the trucking of water, the project reduces carbon dioxide emissions.

Does the project reflect leadership and excellence in the advancement of community development?

Clean, safe water is a key element to the success of any community and the careful and responsible stewardship of this valuable resource is vital. Virtually all of the climate change models warn of future water shortages in all jurisdictions, and by taking this proactive step now, the City of Dawson Creek will ensure a stable water supply for years to come. By including an industry partner in the project, the City saves millions of dollars in infrastructure spending and even has an additional source of possible income from the sale of surplus treated effluent to other industrial users as well as for city use such as watering soccer fields and for street cleaning. The leadership the City has demonstrated in developing this excellent project can be an example and an inspiration to other municipalities faced with similar challenges.

How was this project a good use of budget and resources?

The costs the City of Dawson Creek incurred in developing the project were limited to generating the feasibility study, the RFP process and managing the project. Under the terms of the agreement, the construction costs of 9.75 million dollars will be incurred by Shell Canada with the City having the opportunity of selling up to $500,000 of the treated effluent to other industry users.

Does the project encourage economic sustainability?

Since the only water supply for the City of Dawson Creek and surrounding rural area is the Kiskatinaw River, the conservation of this resource is vital to the continuing economic sustainability and development of the City. There are no other feasible water sources in the area and this has been a concern. This project ensures that the current infrastructure and water supply will meet the needs of the community until 2035, based on current growth and usage rates.

Does the project encourage social sustainability?

The City of Dawson Creek takes every opportunity to engage the public in the planning of capital projects and ensures that the decisions are made in an inclusive and transparent manner. This project is no exception, with two public consultations, one for industry representatives and one for the general public. The City is also considered a leader in promoting and incorporating energy sustainability initiatives and prides itself as a progressive community, a fact which most residents are proud of. Being a leader in the conservation of water, and in developing progressive relationships with industry partners to solve problems, also promotes social sustainability.

What makes your program/project innovative?

This project is innovative as it addresses a number of issues, namely the increased use of limited and expensive potable drinking water for industrial processes, the effluent release into the Dawson Creek, the number of water trucks on the roads in the region, and the protection of the sole water supply for the City of Dawson Creek and area. It is also innovative because of the public/private arrangement with Shell Canada the City has entered into is to build the infrastructure needed to process the effluent to the standard required for industrial use. Dawson Creek has a limited water supply and innovative projects are required to ensure there is sufficient water to meet the demands of a growing population and industrial base. Projects such as this one are designed for the long-term, far beyond the traditional election cycle and will provide benefits for years to come. All municipalities and citizens benefit from this type of long-term planning and innovation.

Was teamwork/collaboration exhibited throughout the project or an end result?

This project was initiated through a number of public consultations, one with industry stakeholders and one with the general public and special interest groups. The project charter and work plan were developed by a team of environmental scientists and environmental planners in consultation with the City of Dawson Creek. This collaboration resulted in the issuing of the RFP and the identification of the successful proponent, Shell Canada.

The collaboration with Shell Canada is the cornerstone of the project. Shell Canada will contribute 9.75 million dollars to the construction of the effluent treatment plant and in return, they receive access to 3,400 cubic metres of treated water from the plant, ensuring a secure water supply for the extraction of natural gas. The City of Dawson Creek benefits because of the reduction in the demand for treated potable water from the municipal water treatment facility and the Kiskatinaw River and by the additional water available for street cleaning and irrigation of city owned facilities.

Conclusion

This project can be easily replicated in other communities where the water supply is threatened and there is significant industrial water usage. It can provide industry stakeholders an opportunity to secure needed water without taking away from the growth potential of the community.

The project recycles wastewater into a state useful to industry without taking anything away from the environment and with no impact on the community. It is truly a win-win for everyone.