

DRAYTON VALLEY RAW WATER PUMP STATION

CHANDOS CASE STUDY

AT A GLANCE

TIGHT BUDGET

The budget for this project was set at \$4.2 million. We knew that a conventional pump system would cost at least \$7 million based on previous information.

ESSENTIAL UPGRADES

The existing pumping station was at risk of failure at the outset of the project and was operating at maximum capacity within the 100 year flood plain.

THE FIRST

This is the first municipal water project in Canada to be completed using Integrated Project Delivery (IPD). Historically IPD had not been used on projects of this size.

THE FUTURE

As a result of the Town of Drayton Valley's leadership in innovation, this project created a blueprint for other municipalities to follow. The project was so successful that IPD has become one of the preferred delivery models for the Town.

WHY INTEGRATED PROJECT DELIVERY (IPD)?

The Town of Drayton Valley needed an updated raw water pump station. They were looking for an innovative and collaborative design that would function effectively, with limited maintenance and allow for future expansion.

"Their existing raw water pump station was ready to fail at any time," said Aleksi Makila, Project Director. "If it failed, the town would have no means of getting clean water."

Leveraging our joint-venture experience with Bird Construction, we pursued this project confident that the chosen Integrated Project Delivery (IPD) method would be the ideal for this scope of work. The scale of the project was unproven in IPD and we knew we would deliver the client efficiencies, value and knowledge required to be successful.

The goal was to get water from the North Saskatchewan River up to Drayton Valley's water treatment plant. A conventional method of doing this typically includes a deep wet well and a pumping station with vertical turbine pumps. This would have been extremely risky and costly – under an already tight budget. It would also require deep excavation – up to 13 metres to have the hydraulics work from the existing stilling basin.

The team collectively decided against this method due to the risk and requirements and began brainstorming different solutions. Under IPD, participants can thoroughly analyze the work needed on a project, pinpoint potential issues, and prevent them from occurring early-on. The group working on Drayton Valley's water pump station, came up with four potential solutions and decided on the final by using a 'choosing by advantages' method. It weighs the different options against the owner's values to determine the best solution.

The ultimate decision was to install three, 200 horsepower, down-hole well pumps. This solution allowed the system to function with minimal operator maintenance, efficient system design, and low impact to the surrounding area and banks of the North Saskatchewan River. Interestingly, this option was brought forth by the Electrical engineer, Darin Drisner, in the brainstorming session. “In a conventional design-bid-build model that is prevalent in the market, the electrical engineer would likely never have an opportunity to be involved at this stage in developing the overall concept design. This is the beauty of IPD.” said Makila.

IPD optimizes early engagement from all stakeholders. It puts the right people in the room at the right time and draws on their talents. Amounting to a deeper level of collaboration.

“Without the collaborative model of IPD, we never would have come up with this solution,” added Makila.

During construction, the team came up against several challenges. A problematic pumping location, defective pumps, and managing different relationships and partnerships. But, since everyone was engaged from the get-go, they were able to overcome challenges together, and ultimately, come up with solutions in the best interest of the client.

“Every challenge that came up, under a traditional project would have been make-or-break,” said Makila. “With IPD, all of the challenges that came up, led to positive outcomes for the client.”

IPD naturally fosters this type of efficiency and innovation. It improves outcomes at all phases of construction and it positively affects the long-term lifecycle and maintenance of projects. IPD relies on teams to have aligned goals, come up with decisions collectively and share the risks and rewards.

“The success of Drayton Valley speaks to the functionality of our team,” said Makila. “We were productive and on point. We were transparent with one another and the client. We were strong enough to adapt to and overcome challenges. When you have a strong team and culture – you make it work.”

Through collaboration and the efficiencies of IPD, Drayton Valley’s raw water pump station was completed almost \$1 million under budget. The success of this project resulted in the town procuring other opportunities using IPD and Chandos securing another IPD job with the Town. As well as positioned us as a strong contender in projects for other municipalities - such as Lloydminster’s wastewater treatment plant.



One of the most important things you look for in a contractor is quality of work. Having worked with Chandos in the past, and knowing that I was going to have a great finished product at the end was essential.”

Khaled Mouallem
Manager of Utilities, Town of Drayton Valley





THE CHALLENGES

- The stilling basin sludge depth was greater than expected. Thus, we couldn't install porta-dams for an isolation method as planned.
- The pump cans location were not optimized in the stilling basin due to an existing utility right-of-way (ROW). This affected the intake and required a lock block baffle wall.
- There was a manufacturing defect in the existing pumps which were causing them to malfunction during operation.
- Challenges with approval and signoff from counsel for the project following the validation phase.

THE FIXES

- Collaborating with Alberta Environment and Parks, we used the existing intake weir as a pumping location. This saved \$120,000 and the owner was able to de-sludge the basin as an added value.
- We worked with ARC Resources to install pump cans into the ROW at no additional cost. This saved \$80,000 from the budget and eliminated the lock block baffle wall.
- We leveraged relationships with pump suppliers to expedite the delivery of the new pump motors.
- We held an in-depth meeting with key leadership stakeholders to show the benefits of IPD and received approval to proceed.



The client could feel our energy, passion and desire to make a difference in the industry. They knew that IPD was part of our culture and we all wanted to be apart of the pioneering efforts together. It was a perfect fit. ”

Aleksi Makila
Project Director, Chandos Construction