

Case Study

BC Hydro Keeps Dam Construction Project Flowing with Trinity Ecofish Water Quality Monitoring Solution

BC Hydro, a provincial Crown corporation owned by the government and people of British Columbia, Canada, began construction of a new clean energy project in 2015. The goal of the project was to construct a 3,609-foot (1,100-metre) wide x 197-foot (60-metre) tall earthfill hydroelectric dam across the Peace River, in keeping with several environmental compliance requirements and permit restrictions involving water quality, acute toxicity, suspended sediments, water temperature, and fish habitat. BC Hydro hired Ecofish Research Ltd., a consulting and environmental services firm acquired by Trinity Consultants in 2022, to advise on and help manage key environmental risks through environmental compliance monitoring at Site C beginning in 2016.

Until 2017, the contractor constructing the dam manually performed water quality regulatory monitoring and reporting. However, delays associated with the manual effort proved unsatisfactory, so BC Hydro commissioned Ecofish to devise an automated solution for comparison.

Ecofish spent the next several months developing an automated, remote water quality monitoring solution, to work in parallel with the manual system in place. The Ecofish solution proved worthy, and before the year was out, Ecofish took over the compliance monitoring and reporting duties.



Challenge

Monitor and manage water quality and compliance related to the construction of BC Hydro's 3,609-foot (1,100-metre) wide hydroelectric dam across the Peace River.



Solution

Ecofish employed its EcoDAT data management system to efficiently automate and centralize project data acquisition, analysis, and compliance reporting.



Result

Eliminated manual sampling and compliance activities for improved accuracy, safety, and cost savings, with a proven, ongoing solution that can be repurposed in future construction projects.



Challenge

Dam construction required instream work (i.e., infilling of the Peace River to construct the dam), which would result in increased total suspended solids (TSS) in the Peace River that if unmitigated, could have negative effects on fish and fish habitat. To manage these potential effects and meet regulatory requirements, the project would require monitoring and managing sediment inputs caused by construction activities in real-time using site-specific TSS-based water quality objectives developed by Ecofish prior to the start of construction using a dose-response model.

Solution

Ecofish linked remote water quality sensors to its proprietary EcoDAT data management software system to automate data acquisition, analysis, compliance screening, non-compliance notifications, and reporting activities for continuous water quality monitoring.

Ongoing automated data collection was achieved via continuous remote sensors connected to data loggers equipped with cellular or satellite telemetry technology, up- and downstream of the dam construction site. The transmitted data were then sent directly to EcoDAT where the data were centrally managed and automatically analyzed against compliance criteria to ensure water quality remained within acceptable ranges. Information regarding water conditions was transmitted to site managers and staff via email and over a browser portal in real-time, supported by automated compliance alarms to flag anomalies for immediate remediation.

To ensure the system's ongoing efficacy, Ecofish continues to conduct ongoing station maintenance, including multiple sensor calibrations each year, with all activities tracked in a master maintenance log.

Result

Since Ecofish began compliance monitoring in 2017, BC Hydro has nearly completed construction of the dam. Ecofish's automated approach:

- ▶ Eliminated safety concerns relative to manual data collection, while reducing operating cost and human error
- ▶ Reduced costs, improved data management and data quality through use of a single, centralized monitoring system
- ▶ Accelerated response times to unplanned events and environmental exceedances
- ▶ Standardized and simplified compliance reporting
- ▶ Established a reusable system with data points useful in planning future projects

About Trinity Consultants

Trinity Consultants, a leading global environmental consulting firm, provides services and solutions in the EH&S Regulatory Compliance, Built Environment, Life Sciences, and Water & Ecology markets. Founded in 1974 Trinity has the technical expertise, industry depth, and capabilities to help clients achieve their goals across the natural and built environments.