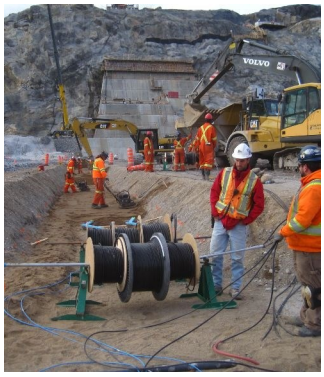
La Romaine-3 Dam, Havre-Saint-Pierre, QC



Installation 4500HD piezometers.

Upstream Horizontal SAA Installation.

Custom DL Series Dataloggers, Hydro Quebec standards.

La Romaine-3 Dam, located North of Havre-Saint-Pierre municipality.

In the early design phase of La Romaine-2, GKM helped SNC Lavalin with the monitoring design of tailor-made high-temperature total pressure cells for measuring stresses in the asphaltic (bitumen) core and proceeded with the supply and successful installations in the summer of 2013.

Again in 2015 GKM Consultants' services were retained to supply hardware and provide assistance at the La Romaine-3 project for the installation of geotechnical instruments and control panels measuring flow in weirs, pore pressure, settlement in the clay core, and filter zones in the dam and dike.

Instruments comprised fiber optic piezometers from FISO & OPSENS, vibrating wire piezometers from ROCTEST and GEOKON, open standpipe piezometers from JOHNSON SCREEN, V-notch weir ultrasonic MULTIRANGER flowmeters, and Shape Accel Array (SAA) from MEASURAND. The instruments are read automatically with custom-built control panels with CAMPBELL SCIENTIFIC dataloggers to meet Hydro-Quebec specifications.

This project marked one of the very first uses of SAA installed horizontally. A total of 6 100+m long horizontal SAA were laid in the dam body to measure deformations longitudinal in 3D & 3E the dam core and transversal in 2B filter zones, on both upstream and downstream sides.

Transversal SAA's were anchored in bedrock on the abutment, and cables instruments on the upstream side were also routed and properly plugged into side the abutment. All SAA and cables were installed in custom telescopic conduit protection to sustain anticipated settlement.

QA/QC testing and verification protocols were developed and performed for each instrument prior to installation. On-site involvement of GKM Consultants was also required throughout various stages to guarantee the highest standards during installation and cable routing control during backfilling activities. With frequent measurement control for establishing initial and baseline readings as well as ensuring good functionality and to prevent nonconformity for the benefit of the general contractor.

The final commissioning and programming of the data acquisition systems were performed after all signal cables were routed to the monitoring shelters. Meanwhile, the periodic measurement and frequency instruments database are being manually recorded to provide early data and to check the proper functioning of the instruments.

This new generating station, in addition to meeting Québec's power requirements for the next 100 years, will enable HQ to sell clean, renewable, and reliable energy to our neighbors in the United States, thereby helping to reduce greenhouse gas emissions. GKM Consultants is very proud to be involved with Hydro Quebec in their ambition to develop a major source of renewable and sustainable energy.