

Exploration and development of large diameter water wells in Quaternary deposits in a regulatory environment: a case study of the exploration and development of community and industrial water supplies

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Exploration and development of water supplies for municipal, industrial, and commercial use are subject to the regulatory regime for the area in which it is being developed. Several example scenarios will be presented focusing on the exploration and development of both industrial and municipal water supplies in New Brunswick while navigating provincial Environmental Impact Assessment regulations and guidance.

When facing budget and timeline constraints along with a rigorous regulatory environment, innovative approaches and methods were utilized to work through each phase of exploration and development. In particular, larger-scale water supply developments in unconsolidated stratigraphy pose some advantages and disadvantages with respect to location, drilling methods, and aquifer protection. In the early stages of water exploration, multiple well site locations are proposed to a broad spectrum of regulatory reviewers such that environmental impacts of the entire anticipated project are considered. At this stage wellfield protection is also considered for each drill target location and potential land-use issues and sources of contamination are examined. Once drilling locations are approved the intrusive field testing can begin including additional drilling and aquifer testing. For high-yielding wells alternate methods to standard air rotary drilling were used pending anticipated conditions. As well, remote water-level monitoring technology (telemetry) has been integrated into long term yield testing to collect data and reduce costs.

Canada's geomorphology is, in part, the result of the planet's last glaciation and modern day alluvial processes. These Quaternary sediments, combined with a constant head of fresh water supply in the right setting, can deliver ideal hydrostratigraphy for water supply development. This is what has been observed for communities and industries situated along one of New Brunswick's major river systems, the Saint John River.