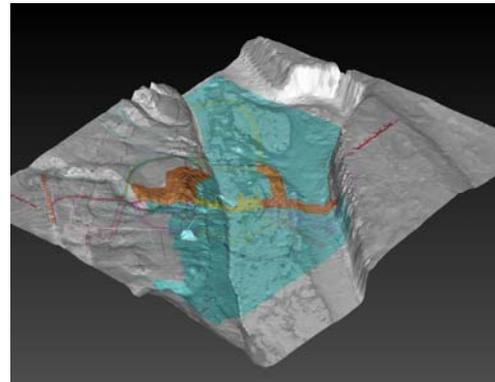


# CONAWAPA GENERATING STATION GEOLOGICAL AND HYDROGEOLOGICAL MODELING

Manitoba Hydro

Northern Manitoba



## Project Description

Manitoba Hydro is proposing to construct a 1200 MW hydroelectric generating station on the Nelson River approximately 235 kilometres south of Churchill Manitoba. The geology at the site consists of post-glacial clay, silt and granular deposits, up to 20 m thick, overlying glacial till up to 60 m in thickness. The underlying carbonate bedrock consists of 8 to 10 m of highly solutioned karstic limestone and dolomite. The Nelson River channel consists of 3 to 5 m of recent alluvium with the proposed south abutment situated on a bedrock trough infilled with alluvium up to 30 m in depth.

KGS Acres Ltd. completed digital modeling of geological and hydrogeological data for the foundation design and analysis of the proposed Conawapa Generating Station in Northern Manitoba as part of Manitoba Hydro's Recommitment Study (Stage IV) following the project's suspension in the early 1990s. 3D geological and hydrogeological models were developed to consolidate and improve Manitoba Hydro's ability to understand all of the information and to assist in developing engineering alternatives, which will improve the overall confidence of the proposed design. These tools were also leveraged for use in environmental studies. Conawapa's unique site location, geology, and groundwater conditions also presented significant challenges related to amassing data collected during many years of investigations. The geological and groundwater models for Conawapa were constructed utilizing a modular based Mining Visualization System (MVS) and finite element FEFLOW programs.

The site geological model combined topographic, bathymetric, geotechnical, and geophysical data, including bedrock fracture permeability, into a comprehensive visualization and analysis tool. The groundwater models were calibrated using detailed groundwater monitoring, pumping test and permeability test data collected by KGS Acres Ltd. These tools also assisted in the design and analysis of various critical conditions, such as grouting design assessment, seepage quantities during construction, and during impoundment and operation.