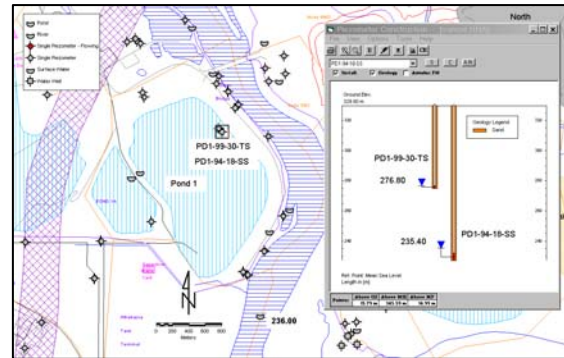


Review of Suncor's Oil Sands mining activity

Project Location:	Athabasca Oil Sands
Client(s):	Mikisew Cree First Nation
Date Completed:	2005, 2006
Project Budget:	\$ 75,000



Downward directed flow of recharged tailings fluids and precipitation trough tailings disposal area Pond 1. Diagram from the proprietary program HD.

Project Summary

A series of applications and a subsequent hearing led to the evaluation of Suncor's mining activity in the vicinity of the Athabasca River and the Steepbank River. Based on a limited amount of data, it was established that the hydrogeological concepts and mathematical models used for dewatering predictions and environmental assessment were derived from the unfounded assumption that groundwater flow was restricted to Quaternary and Cretaceous layers. The mathematical modelling code was applied to the basal sands only and relied on confining layers above and below the Basal Sands. It was also assumed that the Basal Sands were the important regional aquifer underlying the oil sands while in reality the Basal Sands are discontinuous. Based on these assumptions groundwater flow was considered to be of local extent only and any connection to the Athabasca River was assumed to be negligible.

The review established that Devonian karst layers directly underlie the oil sands and the Basal Sands. They constitute the regional aquifer and are connected to the Athabasca River and the Steepbank River. The necessary inclusion of the Devonian karst into the hydrogeology of the Athabasca Oil Sands amounts to a paradigm shift with respect to technical and environmental consideration of mining activities within the Athabasca Oil Sands.

Services Provided

- * Creation of a hydrogeological database by determining and digitizing geological, water level and chemical data from diagrams in reports and applications of Suncor and its consultants.
- * Evaluation of the hydrogeological database by means of the proprietary program system HD.
- * Expert testimony at meetings and hearings.

Deliverables or Results

- * Several reports to the Mikisew Cree First Nation; the client then delivered these reports to Suncor Mines, to Alberta Environment (AENV), and to the Alberta Energy and Utilities Board (EUB).
- * Presentations to Suncor and their consultants, as well as to a hearing by the EUB.