

HYDROGEOLOGY OF THE STETTLER AREA,
ALBERTA, CANADA

BY

DARREL EUGENE DUNN
B. S. , University of Illinois, 1955

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Darrel Eugene Dunn, Ph.D.
Department of Geology
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A large amount of subsurface lithologic data from seismic shot-holes and water wells in the vicinity of Stettler were analyzed with the aid of a digital computer, and the outcrop and subcrop areas of 4 hydro-stratigraphic units were recognized--Member A of the Cretaceous Edmonton Formation, Member B of the Edmonton Formation, the remainder of the Edmonton Formation plus the lower part of the Tertiary Paskapoo Formation, and the glacial drift. Bedrock aquifer development is poorest in Member B. The best places to explore for drift aquifers is in buried bedrock valley areas determined to be present at high probability levels by a statistical analysis of the lithologic data.

The Stettler town water well field was modeled using a finite-difference method on the digital computer. Drawdowns in the model were matched to drawdowns in the prototype by trial and error adjustment of hydraulic conductivities. Although the accuracy of the model needs further study, it appears to be accurate enough for use in choosing the best locations for new wells within the well field area.

In this study, the velocity of groundwater is regarded as the sum of separate velocities resulting from a hierarchy of topographic features plus the velocity of the pumping water wells. This approach was found to be convenient for analyzing and discussing the flow system.