

Mountain View County

Part of the Red Deer River Basin
Parts of Tp 029 to 034, R 26 to 29, W4M and R 01 to 07, W5M
Regional Groundwater Assessment

Prepared for



In conjunction with



Agriculture and
Agri-Food Canada

Agriculture et
Agroalimentaire Canada

Prairie Farm Rehabilitation
Administration

Administration du rétablissement
agricole des Prairies

Canada 

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HYDROGEOLOGICAL CONSULTANTS LTD.

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The Association of Professional Engineers,
Geologists and Geophysicists of Alberta

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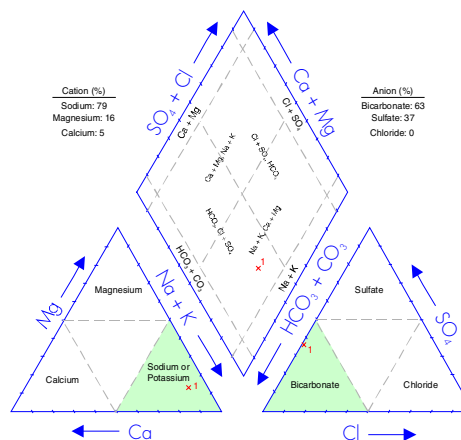
Appendices

- A. Hydrogeological Maps and Figures
- B. Maps and Figures on CD-ROM
- C. General Water Well Information
- D. Maps and Figures Included as Large Plots
- E. Water Wells Recommended for Field Verification

Glossary

Aquifer	a formation, group of formations, or part of a formation that contains saturated permeable rocks capable of transmitting groundwater to water wells or springs in economical quantities
Aquitard	a confining bed that retards but does not prevent the flow of water to or from an adjacent aquifer
Available Drawdown	in a confined aquifer, the distance between the non-pumping water level and the top of the aquifer in an unconfined aquifer (water table aquifer), two thirds of the saturated thickness of the aquifer
Borehole	includes all “work types” except springs
Dewatering	the removal of groundwater from an aquifer for purposes other than use
Evapotranspiration	a combination of evaporation from open bodies of water, evaporation from soil surfaces, and transpiration from the soil by plants (Freeze and Cherry, 1979)
Fluvial	produced by the action of a stream or river
Friable	poorly cemented
Hydraulic Conductivity	the rate of flow of water through a unit cross-section under a unit hydraulic gradient; units are length/time
km	kilometre
Kriging	a geo-statistical method for gridding irregularly-spaced data (Cressie, 1990)
Lacustrine	fine-grained sedimentary deposits associated with a lake environment and not including shore-line deposits
Lithology	description of rock material
Lsd	Legal Subdivision
m	metres
mm	millimetres
m ² /day	metres squared per day
m ³	cubic metres
m ³ /day	cubic metres per day
mg/L	milligrams per litre
Obs WW	Observation Water Well

Piper tri-linear diagram a method that permits the major cation and anion compositions of single or multiple samples to be represented on a single graph. This presentation allows groupings or trends in the data to be identified. From the Piper tri-linear diagram, it can be seen that the groundwater from this sample water well is a sodium-bicarbonate-type. The chemical type has been determined by graphically calculating the dominant cation and anion. For a more detailed explanation, please refer to Freeze and Cherry, 1979



Piper Tri-Linear Diagram

- Rock** earth material below the root zone
- Surficial Deposits** includes all sediments above the bedrock
- Thalweg** the line connecting the lowest points along a stream bed or valley; *longitudinal profile*
- Till** a sediment deposited directly by a glacier that is unsorted and consisting of any grain size ranging from clay to boulders
- Transmissivity** the rate at which water is transmitted through a unit width of an aquifer under a unit hydraulic gradient: a measure of the ease with which groundwater can move through the aquifer
 - Apparent Transmissivity:** the value determined from a summary of aquifer test data, usually involving only two water-level readings
 - Effective Transmissivity:** the value determined from late pumping and/or late recovery water-level data from an aquifer test
 - Aquifer Transmissivity:** the value determined by multiplying the hydraulic conductivity of an aquifer by the thickness of the aquifer
- Water Well** a hole in the ground for the purpose of obtaining groundwater; “work type” includes test hole, chemistry, deepened, well inventory, federal well survey, reconditioned, reconstructed, new, old well-test
- Yield** a regional analysis term referring to the rate a properly completed water well could be pumped, if fully penetrating the aquifer
 - Apparent Yield:** based mainly on apparent transmissivity
 - Long-Term Yield:** based on effective transmissivity
- AENV** Alberta Environment
- AMSL** above mean sea level
- DEM** Digital Elevation Model
- DST** drill stem test

EUB	Alberta Energy and Utilities Board
GCDWQ	Guidelines for Canadian Drinking Water Quality
NPWL	non-pumping water level
PFRA	Prairie Farm Rehabilitation Administration
TDS	Total Dissolved Solids
WSW	Water Source Well or Water Supply Well

I. PROJECT OVERVIEW

“Water is the lifeblood of the earth.” - Anonymous

How a County takes care of one of its most precious resources - groundwater - reflects the future wealth and health of its people. Good environmental practices are not an accident. They must include genuine foresight with knowledgeable planning. Implementation of strong practices not only commits to a better quality of life for future generations, but also creates a solid base for increased economic activity. **Though this report’s scope is regional, it is a first step for Mountain View County in managing their groundwater. It is also a guide for future groundwater-related projects.**

A. Purpose

This project is a regional groundwater assessment of Mountain View County prepared by Hydrogeological Consultants Ltd. (HCL) with financial assistance from Prairie Farm Rehabilitation Administration (PFRA). The regional groundwater assessment provides the information to assist in the management of the groundwater resource within the County. Groundwater resource management involves determining the suitability of various areas in the County for particular activities. These activities can vary from the development of groundwater for agricultural or industrial purposes, to the siting of waste storage. **Proper management ensures protection and utilization of the groundwater resource for the maximum benefit of the people of the County.**

The regional groundwater assessment will:

- identify the aquifers¹ within the surficial deposits² and the upper bedrock
- spatially identify the main aquifers
- describe the quantity and quality of the groundwater associated with each aquifer
- identify the hydraulic relationship between aquifers
- identify possible groundwater depletion areas associated with each upper bedrock aquifer.

Under the present program, the groundwater-related data for the County have been assembled. Where practical, the data have been digitized. These data are then being used in the regional groundwater assessment for Mountain View County.

¹ See glossary

² See glossary

B. The Project

This regional study should only be used as a guide. Detailed local studies are required to verify hydrogeological conditions at given locations.

The present project is made up of eight parts as follows:

- Task 1 - Data Collection and Review
- Task 2 - Hydrogeological Maps, Figures, Digital Data Files
- Task 3 – Hydrogeological Evaluation and Preparation of Report
- Task 4 - Groundwater Information Query Software
- Task 5 – Review of Draft Report and GIS Data Files
- Task 6 – Report Presentation and Training Session
- Task 7 – Provision of Report, Maps, Data Layers and Query
- Task 8 – Provision of Compact Disk for Sale to General Public.

This report and the accompanying maps represent Tasks 2 and 3.

C. About This Report

This report provides an overview of (a) the groundwater resources of Mountain View County, (b) the processes used for the present project, and (c) the groundwater characteristics in the County.

Additional technical details are available from files on the CD-ROM to be provided with the final version of this report. The files include the geo-referenced electronic groundwater database, maps showing distribution of various hydrogeological parameters, the groundwater query, and ArcView files. Likewise, all of the illustrations and maps from the present report, plus additional maps, figures and cross-sections, are available on the CD-ROM. For convenience, poster-size maps and cross-sections have been prepared as a visual summary of the results presented in this report. Copies of these poster-size drawings have been forwarded with this report, and are included as page-size drawings in Appendix D.

Appendix A features page-size copies of the figures within the report plus additional maps and cross-sections. An index of the page-size maps and figures is given at the beginning of Appendix A.

Appendix B provides a complete list of maps and figures included on the CD-ROM.

Appendix C includes the following:

- 1) a procedure for conducting aquifer tests with water wells³
- 2) a table of contents for the Water (Ministerial) Regulation under the new Water Act
- 3) a flow chart showing the licensing of a groundwater diversion under the new Water Act
- 4) interpretation of chemical analysis of drinking water
- 5) additional information.

The Water (Ministerial) Regulation deals with the wellhead completion requirement (no more water-well pits), the proper procedure for abandoning unused water wells and the correct procedure for installing a pump in a water well. The new Water Act was proclaimed 10 Jan 1999.

Appendix D includes page-size copies of the poster-size figures provided with this report.

Appendix E provides a list of water wells recommended for field verification.

³ See glossary