

LEGEND

- OVERBURDEN AQUIFER PRESENT (major*, minor).....O,o
- CARBONATE ROCK AQUIFER PRESENT (major, minor).....C,c
- WINNIPEG FORMATION AQUIFER PRESENT (major, minor).....W,w
- PRECAMBRIAN ROCK AQUIFER PRESENT (major minor).....P,p

* A major aquifer, as defined for the purposes of this map, is an aquifer which has widespread areal distribution, occurs within 180 m of the ground surface and is capable of supplying sufficient quantity and quality of groundwater to satisfy domestic needs (0.3+ L/s with total dissolved solids less than 2000 mg/L).

+ A minor aquifer, as defined for the purposes of this map, is an aquifer occurring within 180 m of the ground surface in which groundwater quality is acceptable (less than 2000 mg/L total dissolved solids) but the aquifer is not present throughout the area or the ability of the aquifer to supply sufficient volumes of water for domestic needs (0.3+ L/s) is not always present.

DISCUSSION

Aquifers present in the study area include 1) overburden aquifers which are generally sands and gravels 2) the carbonate rock aquifer which is a general term for all bedrock aquifers from the Ordovician Red River Formation through the Silurian Interlake Group 3) the Winnipeg Formation aquifer and 4) the Precambrian rock aquifer.

Overburden aquifers of sand and gravel occur extensively in glacial moraines and other glacial deposits throughout much of the area between the Brokenhead and Winnipeg Rivers and in the Birds hill area (Tp. 12, R.4 & 5E). Properly constructed and developed wells completed in these materials may yield from 1 to 40 L/s (Rutulis, 1979). Elsewhere sand and gravel aquifers occur locally within till deposits and, more commonly, at the till-bedrock contact. Where carbonate rock is present these sand and gravel aquifers are rarely utilized although in places they may be capable of fairly high yields. East of the Winnipeg River widely scattered sand and gravel deposits form generally low yield aquifers which, however, are utilized where found due to the uncertainty and expense of developing groundwater supplies from the underlying Precambrian bedrock.

The carbonate rock aquifer occurs throughout the western and central part of the map sheet. Wells drilled into this aquifer will almost invariably obtain sufficient yield for household use and yields in excess of 50 L/s can be developed in many areas. Well yield does vary widely from place to place due to variations in fracture frequency, aperture, interconnection and infilling with fine-grained sediments. Water quality is generally good although hard. Saline groundwater is found throughout the full thickness of this aquifer in the extreme southwestern corner of the map sheet and in the lower sections of the aquifer in the southern third of the map sheet west of the Red River.

The Winnipeg Formation aquifer underlies the carbonate rock aquifer throughout the map sheet. Wells completed into this aquifer will generally yield 1-5 L/s with yield up to 10 L/s possible in some areas. Within the map sheet much of this aquifer contains saline groundwater which is unusable for most purposes.

The Precambrian rock aquifer is used as a source of groundwater supply only in the extreme eastern part of the map sheet where alternate sources of groundwater are not available. Well yields in this aquifer are highly variable, ranging from "dry holes" to isolated wells that yield 10 L/s or more. Methods for predicting the locations where moderate yields can be obtained from this aquifer remain essentially undeveloped. Water quality from the aquifer ranges from excellent to poor. Groundwaters in the Precambrian rock are assumed to be saline in those areas in which the groundwaters in the overlying Winnipeg Formation aquifer are saline.

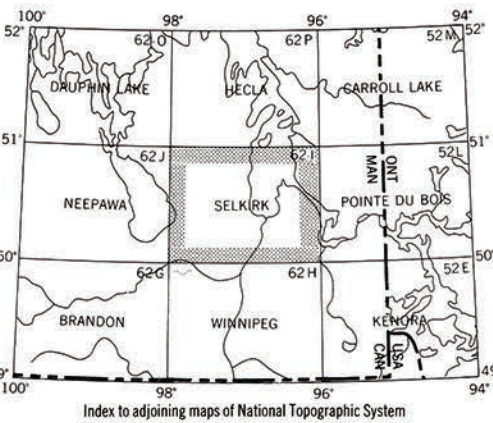
Use of Map

The map sheet has been divided into a number of sub-regions based on the presence of major or minor aquifers. Each sub-region has been identified by a series of letters indicating the aquifers present and whether those aquifers are considered major or minor aquifers within the sub-region. These aquifer symbols have been arranged by ease of aquifer development; the cheapest aquifer to develop is placed first followed by successively more expensive or less likely aquifers.

For example, the symbols C, W, o, p, indicate that both the carbonate and Winnipeg Formation aquifers occur extensively and both aquifers will produce good quality groundwater in sufficient quantities for domestic use throughout the sub-region. The carbonate aquifer symbol is placed first since it overlies the Winnipeg Formation aquifer and wells are generally less expensive to complete in the carbonate rock than in the Winnipeg Formation. The symbols also indicate that overburden or Precambrian rock aquifers are present in some parts of the sub-region and will yield fresh groundwater where present.

Reference:
Rutulis, M., 1979, Groundwater Resources in the Brokenhead Planning District: Manitoba Water Resources Branch.

Prepared by: R.N. Betcher, 1985



Magnetic declination 1976 varies from 7°38' easterly at centre of west edge to 9°44' easterly at centre of east edge. Mean annual change decreasing 4.9'.

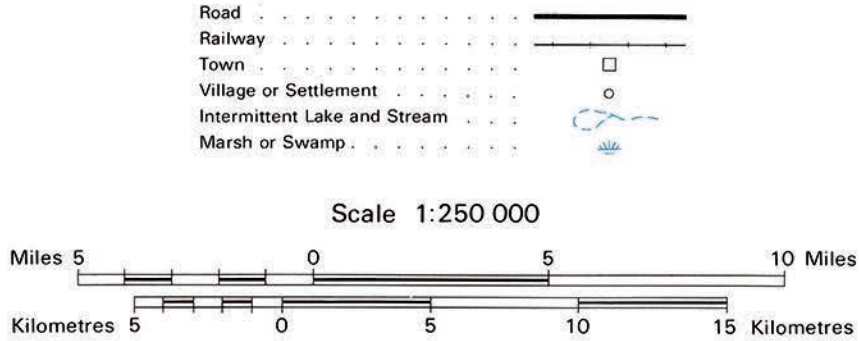
Base Map by: Surveys and Mapping Branch, Department of Energy, Mines and Resources, Ottawa.

PROVINCE OF MANITOBA
DEPARTMENT OF NATURAL RESOURCES
WATER RESOURCES BRANCH

GROUNDWATER AVAILABILITY STUDY
SELKIRK AREA

GENERALIZED AQUIFER MAP
FIGURE 6

MAP LEGEND



Cartography by: Water Resources Branch, Manitoba, 1985/86.

"A Canada-Manitoba Interim Subsidiary Agreement on Water Development for Regional Economic Expansion and Drought Proofing Project."