

- LEGEND**
- PALEOZOIC ROCK AQUIFER SYSTEM** (major +, minor +) **PA,pa**
- MESOZOIC ROCK AQUIFERS**
- JURASSIC ROCK AQUIFERS** (major, minor) **J, J**
- SWAN RIVER FORMATION AQUIFER** (major, minor) **Ksr, ksr**
- CRETACEOUS SHALE AQUIFERS** (major, minor) **K, k**
- OVERBURDEN AQUIFERS** (major, minor) **O, o**

* A major aquifer is defined, for the purpose of this map, to be a water bearing geological unit which has widespread areal distribution, occurs within 180 m of the ground surface and is capable of supplying sufficient groundwater of adequate quality (TDS 2000 mg/L) to meet normal domestic needs (0.3 + L/s).

+ A minor aquifer is defined, for the purposes of this map, to be a water bearing geological unit occurring within 180 m of the ground surface which is generally capable of supplying sufficient groundwater to meet normal domestic needs (0.3 + L/s) but which (a) contains groundwater with a TDS content greater than 2000 mg/L in parts of the area or (b) is not present throughout the entire area.

USE OF MAP

The map sheet area has been divided into a number of sub-regions based on the presence and water quality of 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 (see definitions above) within the sub-region. These aquifer symbols have been arranged by ease of aquifer development; the least expensive to develop and most ubiquitous aquifer is placed first followed by succeeding more expensive to develop or less widely distributed aquifers.

For example, the symbols "PA, o" indicate that the Paleozoic rock aquifer system is present throughout most or all of the sub-region and produces water with less than 2000 mg/L total dissolved solids. Overburden aquifers are also present in the sub-region but are not found throughout the area or do not contain groundwater with less than 2000 mg/L total dissolved solids wherever they occur.

DISCUSSION

Both overburden and bedrock aquifers are present within the map sheet area. Overburden aquifers generally consist of sands and gravels associated with glacial tills or post-glacial sands deposited as deltaic sediments in Lake Agassiz. Bedrock aquifers include (a) carbonate rocks of Silurian and Devonian age which form part of the Paleozoic rock aquifer system in Manitoba (b) Jurassic carbonates and sandstones (c) silica sandstones of the Cretaceous Swan River Formation and (d) Cretaceous shales.

OVERBURDEN AQUIFERS

Aquifers are present in overburden materials throughout much of the map sheet area although sand and gravel deposits are rarely reported in the relatively thin tills east of Lake Manitoba. The most extensive overburden aquifer is the Assiniboine Delta Aquifer (ADA) in the south-central part of the map sheet area where thick surficial sands containing good quality groundwater extend over a broad area. Saturated sand thicknesses vary from approximately two to thirty metres within the outlined boundaries of the aquifer.

East of the Manitoba Escarpment, outside the boundaries of the ADA, inter- or intra-till sand and gravel aquifers are widespread. However, groundwater quality in these aquifers is highly variable spatially and, in most areas, deteriorates rapidly with depth. Throughout much of this area the only aquifers available for development of fresh groundwater supplies are thin surficial sands and silty sands laid down in glacial Lake Agassiz and shallow sands and gravels within the glacial tills. In many instances these aquifers are thin, poorly permeable or have small saturated thicknesses.

Within the Riding Mountain uplands, sand and gravel aquifers are widely distributed in thick tills overlying the Cretaceous bedrock. Groundwater quality in these aquifers is generally acceptable to marginal as recharge waters entering the aquifer through the enveloping fine-grained tills may become somewhat mineralized. In some areas extensive sand and gravel aquifers within the tills have been developed for municipal and high capacity rural requirements.

BEDROCK AQUIFERS

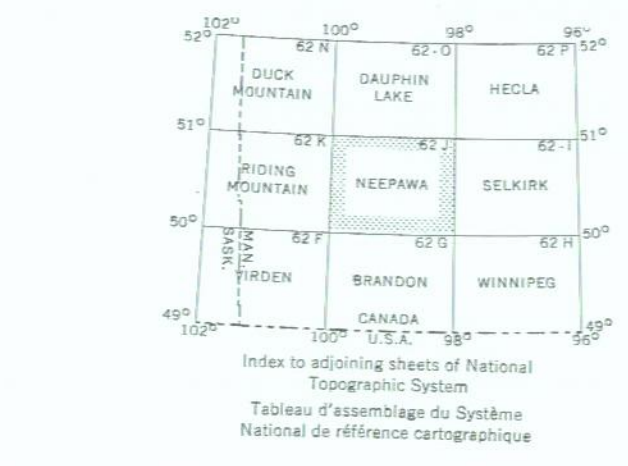
The carbonate rock aquifer system underlies the eastern and central parts of the map sheet area at exploitable depth but contains groundwater with acceptable quality (< 200 mg/L) only in the north-eastern and north-central parts of the map sheet. Drilled wells constructed into this aquifer system will, in almost all cases, yield in excess of 0.3 L/s. In some cases, yields of several tens of litres per second can be obtained.

Jurassic carbonate and sandstone aquifers occur at exploitable depths through much of the central and south-eastern parts of the map sheet area. However groundwater quality is acceptable for domestic use only in a small area in the north-western part of the map sheet. Elsewhere high salinity or excessive sulfate concentrations make the water unsuitable for consumptive use.

Sandstones within the Swan River Formation form a widespread aquifer throughout the western half of the map sheet. Water quality in the aquifer is saline and unsuitable for domestic use in all but a limited area of the north-western part of the map sheet.

Cretaceous shales form the bedrock surface throughout the western part of the map sheet area. Where these shales are fractured they may form a significant aquifer although the yield and water quality is quite variable from place to place.

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PROVINCE OF MANITOBA
DEPARTMENT OF NATURAL RESOURCES
WATER RESOURCES BRANCH
GROUNDWATER AVAILABILITY STUDY
NEEPAWA AREA

**GENERALIZED AQUIFER MAP
FIGURE 6**

- Town: Ville
Village or Settlement: Village ou hameau
Post Office: Bureau de poste
Church: Eglise
School: Ecole
Boundary monument: Borne frontiere
Horizontal control point: Point geodésique
Stream: Cours d'eau
Intermittent or dry: Intermittent ou à sec
Intermittent lake: Lac intermittent
Rapids or falls: Rapides ou chute
Marsh or swamp: Marais ou marécage
Lighthouse: Phare
Airport: Aéroport
Seaplane base: Base d'hydravions

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