

LEGEND

- WATER SAMPLE FROM PALEOZOIC ROCK AQUIFER ▲
 WATER SAMPLE FROM JURASSIC ROCK AQUIFER ⊗
 WATER SAMPLE FROM SWAN RIVER FORMATION ■
 WATER SAMPLE FROM CRETACEOUS SHALE AQUIFER □
 WATER SAMPLE FROM OVERBURDEN AQUIFER x
 WATER SAMPLE FROM UNKNOWN AQUIFER ●
 TOTAL DISSOLVED SOLIDS (mg/L) ●
 FLUID CONDUCTIVITY (μS) ●
 "SALTY" WATER REPORTED BY DRILLER:
 BEDROCK AQUIFER ▲
 OVERBURDEN AQUIFER □

GROUNDWATER GEOCHEMISTRY

Groundwater quality is poor throughout much of the map sheet area with good drinking quality water being found consistently only in the carbonate aquifer system east of Lake Manitoba and in sands of the Assiniboine Delta Aquifer in the south-central part of the map sheet area. The area between the Manitoba Escarpment and Lake Manitoba is part of a regional groundwater discharge area for deep saline waters and subsequently quality groundwater in many overburden and bedrock aquifers in this area is affected by excessive salinity. On the Escarpment, groundwater quality is good in some shallow overburden aquifers but quality problems are encountered in many overburden aquifers due to high dissolved solids loads originating by rock-water geochemical reactions taking place in the tills.

OVERBURDEN AQUIFERS

Groundwater quality in overburden aquifers varies widely, ranging from total dissolved solids (TDS) contents less than 250 mg/L in some shallow sand aquifers to TDS values as much as 23,000 mg/L near Gladstone. On the Escarpment, groundwater is obtained from inter-till sand and gravel deposits. TDS concentrations vary from 500 to 3000 mg/L and groundwaters are Ca-Mg-HCO₃ types at the lower TDS range changing to Ca-Mg-HCO₃-SO₄ type as TDS increases. This is typical of groundwater quality found in till terraines in Manitoba. The groundwaters tend to be moderately to extremely hard and to exceed recommended drinking water standards in iron, manganese and sulfate.

East of the Manitoba Escarpment, groundwaters in sand and gravel aquifers range from fresh Ca-Mg-HCO₃ type waters to saline Na-Cl-SO₄ type waters. Fresh groundwaters are found in the Assiniboine Delta Aquifer and in many shallow (<10m) sand and gravel deposits. Saline groundwaters are found in most areas in intermediate to deep aquifers (>20m). However the complex hydrogeology of this region makes generalization difficult as fresh groundwaters are found in sand and gravel aquifers in some areas at considerable depth while saline groundwaters are found in some areas at less than 10 m depth.

BEDROCK AQUIFERS

The Paleozoic carbonate aquifer system contains fresh Mg-Ca-HCO₃ type groundwaters in the northeastern part of the map sheet area although water quality does deteriorate south of Dog Lake and in the vicinity of Oak Point. West and south of Lake Manitoba groundwaters are generally brackish to saline in this aquifer system.

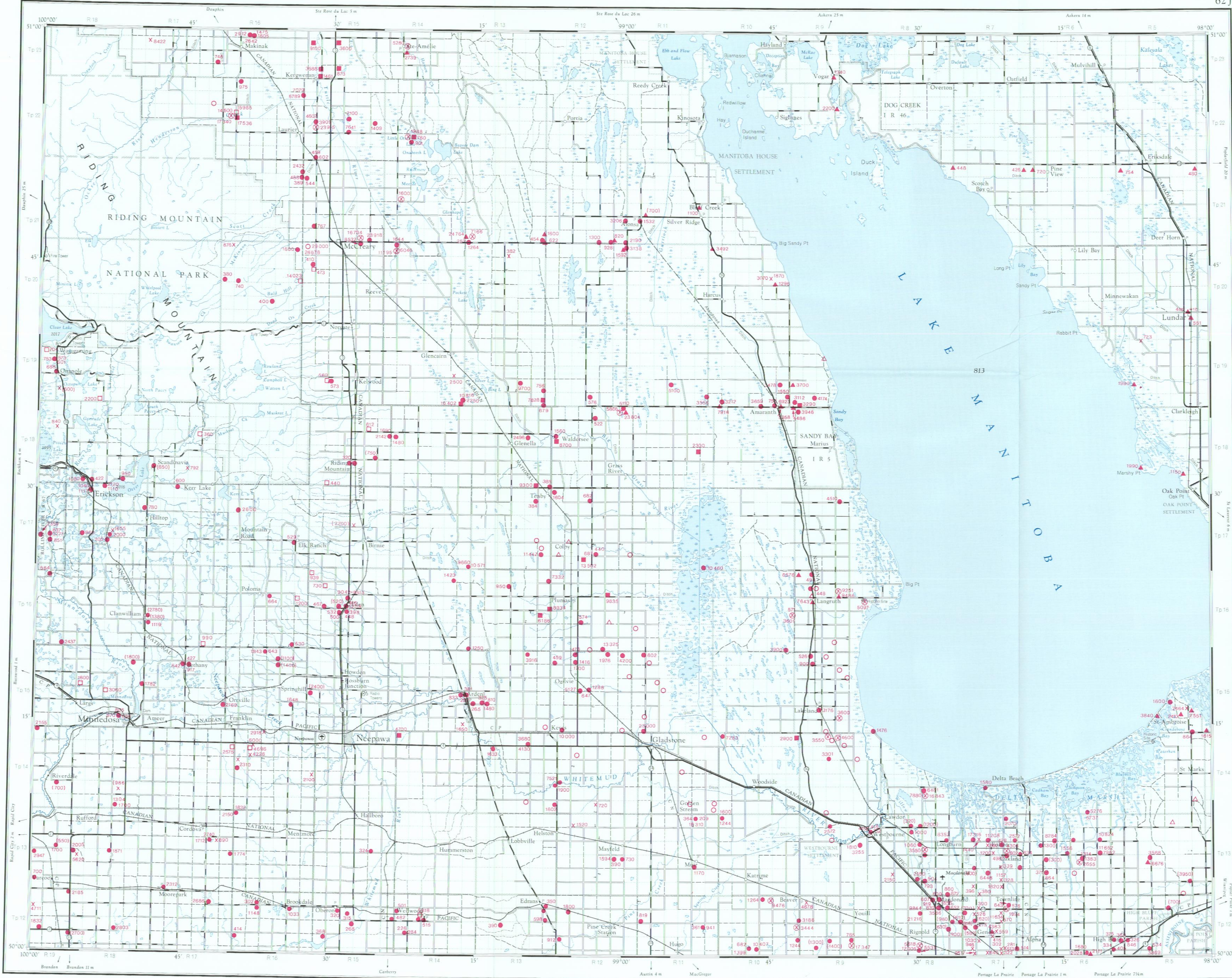
Groundwaters in Jurassic sandstone and limestone aquifers are brackish to saline throughout the entire map sheet area, excluding one sample from NE 08-22-14W. Groundwaters are generally Na-Ca-SO₄-Cl type.

Water quality varies widely in Cretaceous rock aquifers. In the Swan River Formation water quality is fresh to brackish in the north-western part of the map sheet area but quickly deteriorates to brackish and saline waters in the central part of the area. Where fresh groundwaters occur they are generally Na-HCO₃-Cl type with low hardness and may contain excessive amounts of fluoride. In Cretaceous shale aquifers, water quality ranges from fresh to brackish in the western uplands but becomes saline along the north-eastern lower slopes of the Riding Mountains. Groundwaters in the fresh to brackish areas are Ca-Mg-HCO₃ to Na-SO₄-HCO₃ types.

SOURCE OF INFORMATION:

MANITOBA DEPARTMENT OF NATURAL RESOURCES, 1988. Files of Chemical Analysis of Groundwater, Hydrotechnical Services Branch, Winnipeg.

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 DEPARTMENT OF NATURAL RESOURCES
 WATER RESOURCES BRANCH

GROUNDWATER AVAILABILITY STUDY NEEPAWA AREA

WATER QUALITY FIGURE 8

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