

GROUNDWATER RESOURCES IN  
THE R.M. OF ST. FRANCOIS XAVIER  
( A SYNOPSIS)

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## SYNOPSIS

- \* The potable groundwater supply in the Municipality is limited and it is not uniformly distributed. Potable groundwater is available mainly in a narrow zone along the Assiniboine River. The potable water zone widens out near in the western and eastern ends of the Municipality (Figure 1). In most of the Municipality groundwater is saline and not potable.
- \* The potable water aquifers along the Assiniboine River (Figure 1) are formed by lenses of sand in clay and silt alluvial deposits. The depth to the aquifers usually is less than 5 m (metres) and the yield is low. Water quality in the sand aquifers ranges from good to poor.
- \* The main aquifer in the area is formed by carbonate bedrock (limestone and dolomite) that underlies the whole Municipality. In most of the Municipality water in the carbonate rock aquifer is saline and not potable. Potable water in the bedrock aquifer is found in the western end of the Municipality and along its eastern boundary (Figure 1). The depth to the carbonate bedrock ranges from 5 m to 25 m and usually is around 15 m. The yield of the bedrock aquifer is adequate to abundant for domestic and normal farm requirements.
- \* A small elongated sand and gravel aquifer occurs about three kilometres north of the Community of St. Francois Xavier. Water in this aquifer is potable and the quality is good to fair; the total dissolved solids concentration ranges from 1000 mg/L to 1600 mg/L.
- \* Because the shallow sand aquifers are subject to pollution by infiltration from the surface, the same areas where these aquifers may occur are also groundwater pollution hazard areas (Figure 2).
- \* The carbonate rock aquifer is overlain by fairly thick clay and glacial till layer and, therefore, is not likely to be polluted by infiltration of pollutants from the surface.
- \* Groundwater development may cause changes in the regional groundwater flow pattern that, in turn, may cause shifting of the fresh-water and salt-water boundary. In particular, high yield wells near the boundary in the fresh-water area of the carbonate rock aquifer may cause saline water intrusion in the fresh water area.

R.M. OF FRANCOIS XAVIER  
DEVELOPMENT PLAN  
-GROUNDWATER-

CONCERNS

Potable groundwater resources in the Municipality are not uniformly distributed; in some parts of the Municipality it is available and in extensive areas it is very scarce to non-existent. Hence the overall concern is groundwater resource management and protection to assure adequate supply for existing users and for potential development. Most of the potable water aquifers are at a shallow depth and are subject to pollution. The areas where the shallow aquifer may occur are considered to be groundwater pollution hazard areas (Groundwater Synopsis, Figure 2). Deeper potable aquifers that are not likely to be polluted by water infiltration from the surface exist in the eastern and western end of the municipality.

OBJECTIVES

Principal Objective

To manage the aquifers in a manner that would not deprive existing users of their water supply and would not have a detrimental effect on aquifer potential in the District.

Specific Objectives

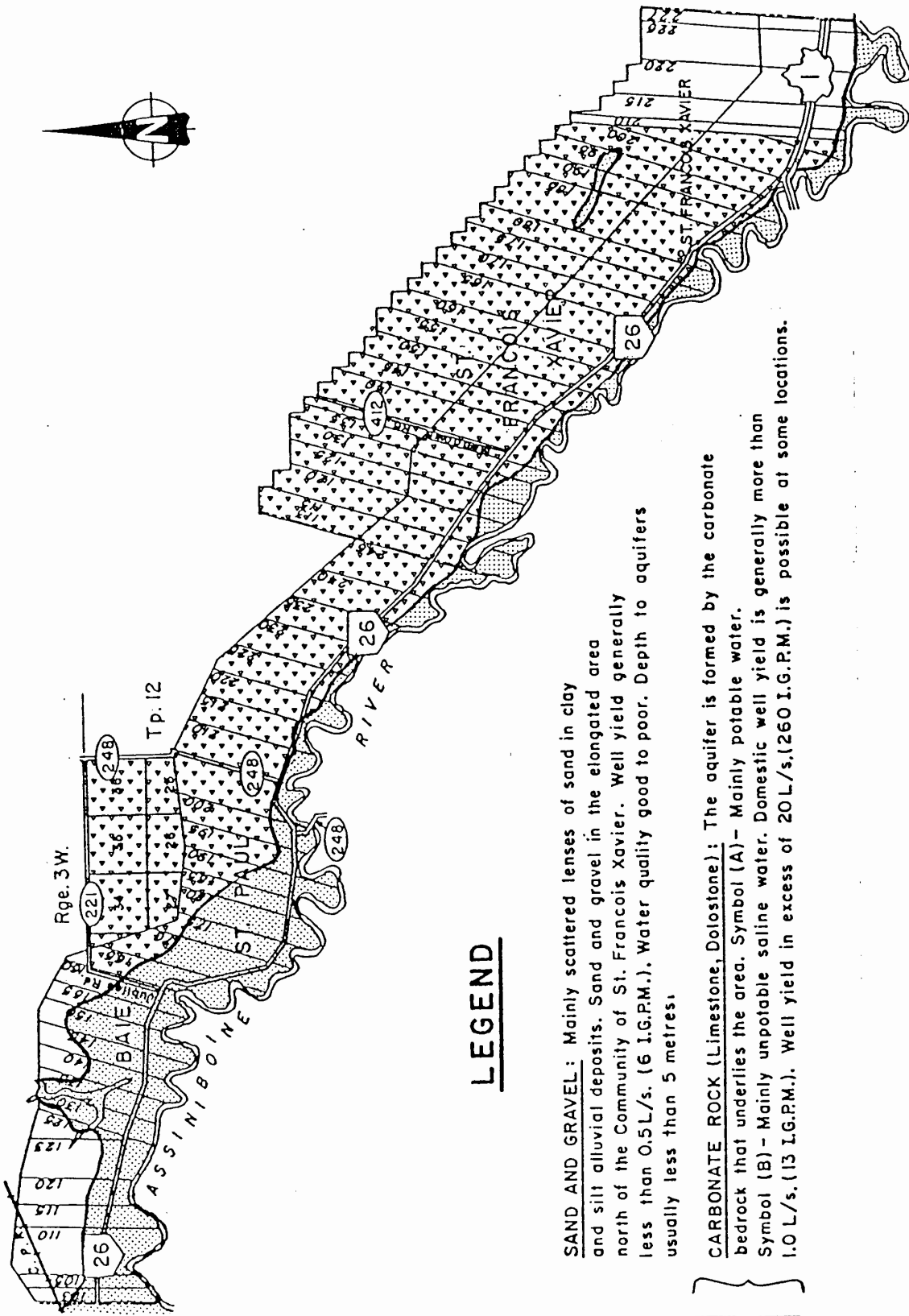
- \* To maintain groundwater withdrawal within acceptable limits.
  
- \* To prevent aquifer pollution.

## POLICIES



- \* Intensive development and high capacity wells should be permitted only in areas where they will not cause a reduction in water supply for existing users.
- \* Groundwater consumption should not exceed the total sustained yield of an aquifer.
- \* Wells should be installed in a manner that would not have a detrimental effect on aquifers.
- \* Activities that may cause pollution under normal operating conditions or by accident should not be permitted in the groundwater pollution hazard area unless it can be proved by adequate field investigations that the proposed activities will not cause pollution of existing or potential groundwater supply in the area.

## IMPLEMENTATION

- \* Aquifer management is implemented by the Water Resources Branch of the Manitoba Natural Resources under the provisions of the Ground Water and Water Well Act and the Water Rights Act.
- \* Well construction in respect to prevention of detrimental effect on aquifers is regulated by the Water Resources Branch of the Manitoba Natural Resources under the provisions of the regulations made under the Groundwater and Water Well Act.
- \* Aquifer pollution prevention is implemented by the Environmental Management Division of Manitoba Environment and Workplace Safety and Health.

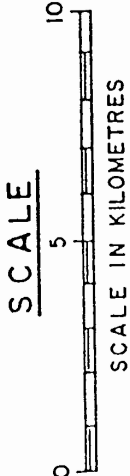


**LEGEND**

- (A) 
- (B) 

**SAND AND GRAVEL:** Mainly scattered lenses of sand in clay and silt alluvial deposits. Sand and gravel in the elongated area north of the Community of St. Francois Xavier. Well yield generally less than 0.5L/s. (6 I.G.P.M.). Water quality good to poor. Depth to aquifers usually less than 5 metres.

**CARBONATE ROCK (Limestone, Dolostone):** The aquifer is formed by the carbonate bedrock that underlies the area. Symbol (A) - Mainly potable water. Symbol (B) - Mainly unpotable saline water. Domestic well yield is generally more than 1.0 L/s. (13 I.G.P.M.). Well yield in excess of 20L/s. (260 I.G.P.M.) is possible at some locations.



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R.M. OF ST. FRANCOIS XAVIER  
**AQUIFERS**  
SCALE AS SHOWN  
DATE 88 05 31  
SHEET 1 of 2  
FILE NO. 90-17-1147

FIGURE 1

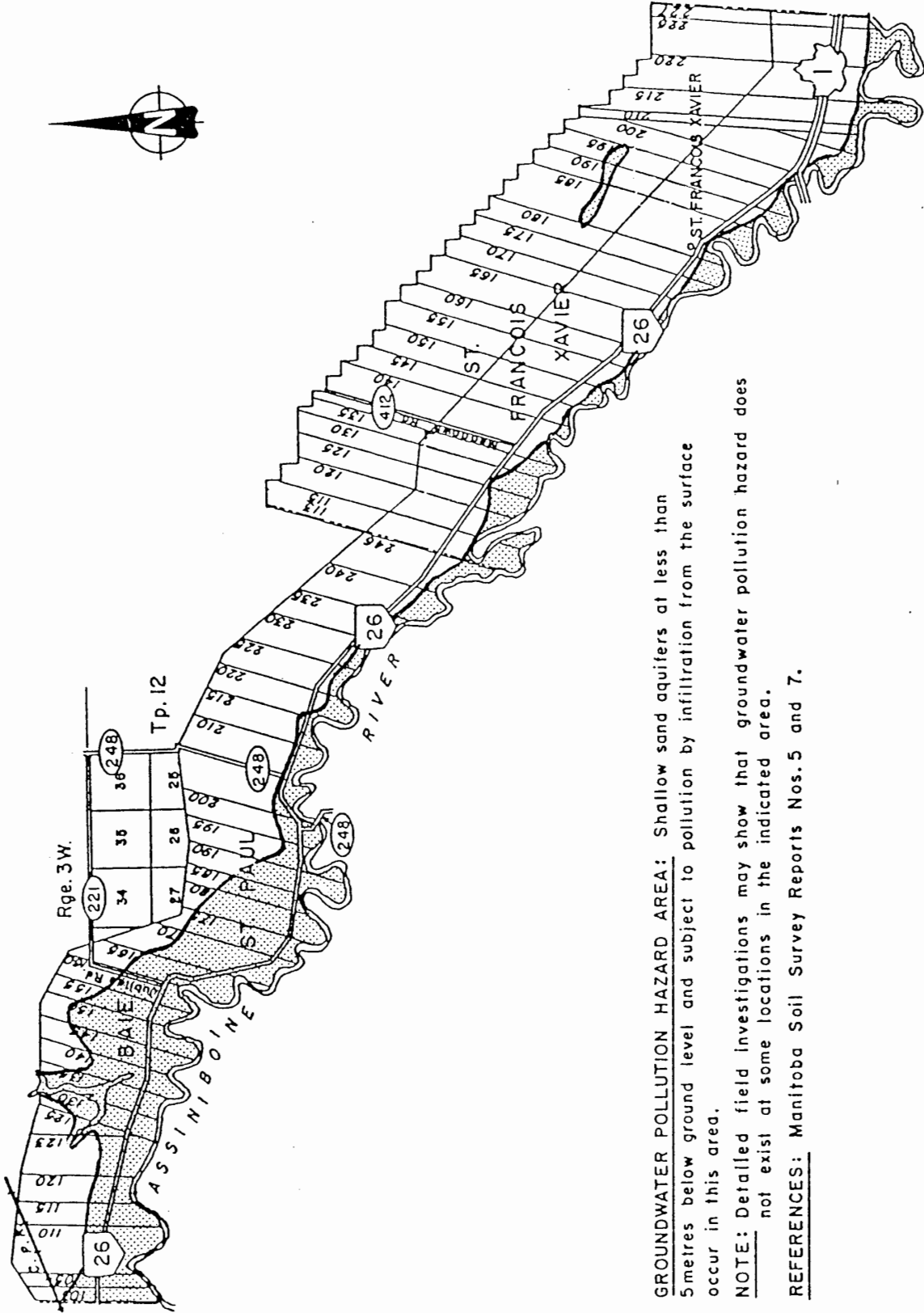
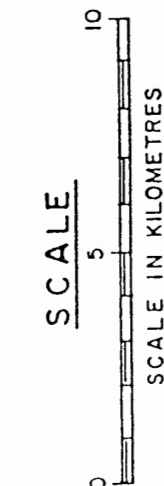


FIGURE 2

— GROUNDWATER POLLUTION HAZARD AREA: Shallow sand aquifers at less than 5 metres below ground level and subject to pollution by infiltration from the surface occur in this area.

NOTE: Detailed field investigations may show that groundwater pollution hazard does not exist at some locations in the indicated area.

REFERENCES: Manitoba Soil Survey Reports Nos. 5 and 7.



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R.M. OF ST. FRANCOIS XAVIER

GROUNDWATER POLLUTION  
HAZARD AREAS

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