

# 1.0 Introduction

UMA Engineering Ltd. (UMA) was retained by the Pembina Valley Water Cooperative Inc. (PVWC) to complete an evaluation of the potential to develop a supplemental groundwater supply for the current surface water source. The PVWC currently operates a water system that supplies treated water to approximately 40,000 residents in the area primarily west of the Red River and south of the City of Winnipeg. This water system withdraws water from the Red River at Morris and Letellier, as well as from the Stephenfield Reservoir on the Boyne River. As part of their ongoing risk management strategy to ensure that the water supply is safe and secure, the PVWC has identified that the water supply is susceptible to periods of drought and to potential contamination from accidental spills upstream of the treatment plants. The PVWC is therefore investigating ways of reducing the risk of water shortages. The preferred solution is to develop a supplemental water supply from an independent source that is capable of supplying at least emergency levels of water. The optimum solution would be to develop a supply capable of sustaining the full system flow as the need arises (low river flow, poor water quality, high demand, etc.).

The PVWC has indicated that, as a minimum, a supplemental water source capable of providing 50 litres per second (650 l/gpm) is required. However it is desirable that a supply source be chosen that could potentially provide up to 300 litres per second (3,950 l/gpm) depending on future needs. Assuming that the system is operated continuously at full flow, the initial annual water requirement would be 1,500 dam<sup>3</sup> per annum, with an ultimate potential annual water requirement of 9,500 dam<sup>3</sup> per annum. The results of an initial evaluation of potential sources and approvals requirements has identified the Bedford Ridge area within the Sandilands Provincial Forest as having the potential to host the required groundwater resources (UMA, March 2005). This report documents the results of investigations undertaken in the Bedford Ridge area and provides an assessment of the viability of developing the required water supply from this location.

## 1.1 Study Area

The study area for this project is shown on Figure 01. It consists of the Bedford Ridge area north of the Village of Sandilands and the area to the east of the ridge. In general, the area explored for groundwater is within Township 5, Range 9 and 10E. An air photo of the same area is provided as Figure 02 to illustrate land uses.

The primary designated land use in the area is forest management within the Sandilands Provincial Forest. With some minor exceptions, the land within this provincial forest is crown owned and is managed to promote forest growth for timber harvesting. Cleared areas are visible on the air photo where portions of the forest have been harvested and not yet regenerated. Other land uses are allowed within the forest provided they do not negatively affect the ability of the forest to regenerate. Land-use for agriculture east of the Bedford Ridge is minimal as the soils have moderately severe to severe limitations for arable agriculture (North-South, 2005).

There are two provincially designated areas within the study area: the Watson P. Davidson Wildlife Management Area (WMA) and the Pocock Lake Ecologic Reserve, both on the west side of the Bedford Ridge (Figure 01). The Watson P. Davidson WMA was established in 1961 under the Crown Lands Act to maintain and enhance the vegetative cover. The area within the WMA is managed to enhance the vegetative growth and ecosystem sustainability. This management has included timber harvesting as recently as 1981, the development of browse and travel lanes for wildlife, the seeding of portions of the area with species of grasses, legumes and trees, the creation of artificial pools and wetlands, and the excavation of man-made drains to enhance runoff and reduce the duration of surface ponding.

The Pocock Lake Ecologic Reserve was set aside in 1982 under the Ecologic Reserve Act to preserve examples of representative ecosystems. In the case of the Pocock Lake Ecologic Reserve, the ecosystems represented are dry uplands and wet bogs, and the transition between the two (North-South, November 2005).

West of the WMA and the Provincial Forest, the land use is agricultural wherever drainage is sufficient to allow agriculture. Otherwise the land has remained as undeveloped forest. Residential dwellings have been developed throughout the area with the main concentration near the Town of Marchand. The only other significant development within the study area are a number of residences in the Villages of Sandilands, St. Labre and Kerry, south and east of the study area, respectively.