

# LAKE MANITOBA LAKE ST. MARTIN

## OUTLET CHANNELS PROJECT

### GROUNDWATER

#### A water resource found in aquifers at various depths under the ground

Environmental Impact Statement—Summary by Valued Component (VC)

#### Why is Groundwater a part of the Surface Water and Groundwater VC?

Groundwater is a resource that supports ecological functions in the watershed and a variety of human land uses such as domestic supply, agricultural and commercial uses. Groundwater also interacts with surface water resources near rivers, lakes, or wetlands.

#### What is the current state of Groundwater?

The aquifer in the Project area discharges into bogs, streams and the major lakes. In many areas, the glacial tills overlying the aquifer prevent free connection with the surface and it is under pressure, seeping out in more porous areas. Based on samples from wells along Lake Manitoba Outlet Channel and Lake St. Martin Outlet Channel, the existing quality of groundwater is generally within acceptable guidelines, and there are groundwater wells in the area.

**Valued components (VCs)** are components of the natural and human environment that are considered by the proponent, public, Indigenous Peoples, scientists and other technical specialists and government agencies involved in the assessment process to have scientific, ecological, economic, social, cultural, archaeological, historical, or other importance.

#### What effects might the Project have on Groundwater?

The Project has the potential to change local and regional groundwater flows, levels and quantity.

Groundwater effects were one of the main concerns expressed by local residents during the design of the Project and played a major role in selecting the best route for the channels. However, as indicated, groundwater in the region is under high artesian pressure, meaning that the water will flow to the surface if there is a pathway. Currently, the overlying geology is acting as an aquiclude (i.e., does not transmit water) protecting the underlying carbonate aquifer. There is a potential for this to be breached during construction, but the risks are lower than other route alternatives that were considered. Risks include potential contamination of wells with surface water and the lowering of water levels in wells.

During the operation of the Project, pressure relief valves may be required along the channel to maintain a safe ground pressure.

While there may be effects to wells using the deeper groundwater, changes in shallow groundwater around the channel excavations will be small (less than 1 m), and the effects will transfer only 10 m to 200 m away, at most. Around Lake St. Martin, the Fairford River and Dauphin River, water levels will decrease during high dewatering conditions due to the Project.

Natural surface and shallow subsurface drainage flow may be affected along the Lake St. Martin Outlet Channel; however, effects to drainage are not expected to occur beyond 500 m of the channel.

It is unlikely that wetlands adjacent to the Lake Manitoba Outlet Channel will be affected during construction dewatering; however, if this occurs, the effect can be mitigated by directing the depressurization groundwater to the wetlands.



## How will Groundwater effects be addressed?

A Groundwater Management Plan is being developed to refine the analyses of effects of dewatering and current enumeration of wells. As the effects to individual landowners may vary, further aquifer investigation and modelling will be carried out to determine the effect of construction dewatering on specific domestic wells. Observation wells will be installed prior to construction dewatering to monitor effect.

In areas of high potential for aquifer exposure a grout injection (clay slurry) may be applied to the geologic materials on top of the groundwater prior to excavation, to address risks.

Based on the monitoring results and working with landowners, mitigation for domestic wells could include lowering existing pumps, supplying new pumps or drilling new wells. In addition, water from construction dewatering will be diverted to wetlands, if/as required.

### FOLLOW-UP AND MONITORING

A monitoring program will improve and validate the groundwater modelling to monitor the effects of dewatering operations on groundwater in the local area. The results will be communicated to local well users that may be affected; developing mitigation plans will involve working with those users. Additional observation wells will be installed prior to construction dewatering to monitor the effects in the area during dewatering of each section during construction.

### CONCLUSIONS

While the regional groundwater flows from the uplands to the major lakes in the area will not be affected by the Project, local groundwater levels and flows will be affected during construction dewatering.

As indicated, the development of the Groundwater Management Plan will include further study of potential effects, meetings and discussions with local landowners and the development of specific mitigation plans for each well user.

### For more information or if you would like to share your concerns:

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