Madoc's Drinking Water System

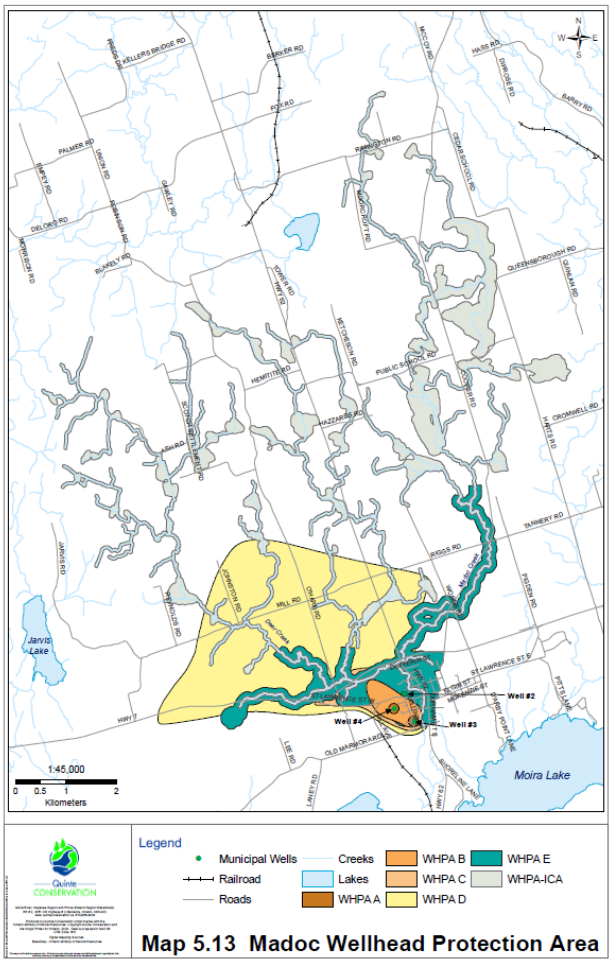
The Village of Madoc is located in the northern portion of the Municipality of Centre Hastings. Madoc is a small community that has a municipal groundwater system that serves less than 2,000 people within the Village. Madoc has two municipal wells surrounded by residential, commercial, open spaces, and industrial land uses. Well #2 (the Whytock Well) and Well #3 (Rollins Well) were used for the municipal supply until the Whytock Well experienced insufficient yields and natural water quality problems. The Whytock Well was decommissioned and Well #4 was installed as a replacement and was integrated into the drinking water systems in 2019.

Both Well #3 and #4 are located near Deer Creek and are classified as Groundwater Under the Direct Influence (GUDI) of surface water. Well #3 was drilled in 2006 to a depth of 49 metres and Well #4 was drilled in 2016 to a depth of 81.6 metres. Both wells are drilled into a Precambrian bedrock aquifer that is along the southern fringe of the Canadian Shield.

Madoc's Vulnerable Areas

Using science, the Assessment Report has delineated zones to show which areas near the wells that are the most vulnerable to pollution and contamination. These zones are called Wellhead Protection Areas (WHPAs) and include the land above and below ground where land use activities could affect the quality of water flowing toward the wells. The location and size of a WHPA is determined by the direction groundwater flows, the speed/rate it moves, and the volume of water that is pumped from the wells. In Madoc, there are six WHPAs:

- **WHPA A:** 100 metre radius around the well.
- **WHPA B:** The area where it would take two years or less for a contaminant to reach the well.
- **WHPA C:** The area where it would take five years or less for a contaminant to reach the well.
- **WHPA D:** The area where it would take 25 years or less for a contaminant to reach the well.
- **WHPA E:** The area where it would take two hours or less to reach the well(s).
- **WHPA-ICA:** the area that has the potential to contribute to a drinking water issue(s) to the well.



Map 5.13 Madoc Wellhead Protection Area

Vulnerability Scores

Vulnerability scores help to quantify how vulnerable a drinking water source is to contamination. The scores are calculated based on the ground conditions around the well, and considers how contaminants might move.

An area with a higher vulnerability score is more likely to allow contaminants from that area to reach a well. The vulnerability scores range from 2 (lowest) to 10 (highest). The vulnerability scores for the Madoc Drinking Water Systems are:

- **WHPA A** = 10
- **WHPA B** = 10
- **WHPA C** = 8
- **WHPA D** = 6
- **WHPA E** = 8.1
- **WHPA-ICA** = no score

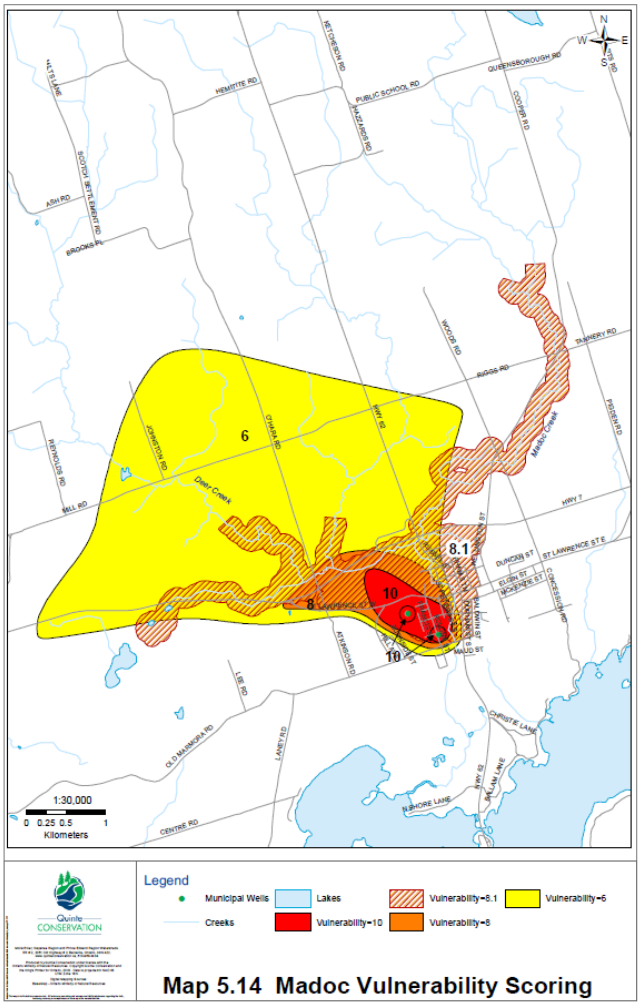
Drinking Water Issues

Drinking water issues are chemicals or bacteria found in untreated water that exceeds the provincial allowable values. A four-step screening process confirmed that Madoc's raw water does have drinking water issues including *E.coli*, total coliforms, and organic nitrogen. Due to the water quality issues, a WHPA-ICA was delineated. Significant threats were identified and risk management plans were negotiated to reduce contamination risk.

Drinking Water Threats

Drinking water threats are based on 22 categories prescribed by the Ministry of the Environment, Conservation and Parks. Threats were identified in Madoc's WHPAs. Some of the identified threat types included, but are not limited to:

- Use of land as livestock grazing or pasturing land, an outdoor confinement area or a farm-animal yard.
- Application and storage of agricultural source material (i.e. manure from livestock).
- Residential and commercial septic systems.
- Application, storage and handling of pesticides and fertilizers.



Map 5.14 Madoc Vulnerability Scoring

The Quinte Source Protection Plan

The Quinte Source Protection Plan has over 80 policies to protect and maintain clean and plentiful drinking water sources. The policies address drinking water threats that were identified in the science-based Assessment Report. Each policy was developed by the Quinte Source Protection Committee in consultation with communities and stakeholders.

The Quinte Source Protection Plan came into effect January 1, 2015 and has undergone amendments in 2019, 2023, and 2024.