

## **Hydrogeology, water quality and groundwater protection of the Miramichi East (former town of Chatham) aquifer, northeastern New Brunswick**

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Miramichi East (the former town of Chatham which now forms part of the City of Miramichi) is located along the south side of the Miramichi River in northeastern New Brunswick and relies entirely on groundwater for its public water supply. Ten wells supply the population in the immediate vicinity of Miramichi East whereas those outside the former town limits rely on individual homeowner wells.

The Miramichi East aquifer is located in the Carboniferous Clifton Formation, which includes discontinuous, lenticular layers of shale, siltstone, sandstone, and conglomerate. Bedding thickness is variable and ranges from a few centimetres to many metres. Based on limited field observations, bedding strikes northeast-southwest and is shallow dipping either to the northwest or southeast. Bedding parallel fractures are common and well-developed in some beds but not in others. The variation in fracture development between beds may be, at least partially, responsible for the wide range of transmissivity values determined by previous workers.

Generally water quality of the Miramichi East aquifer is acceptable, however problems have occurred in the past due to

chloride contamination and high levels of iron and/or manganese. In this study, iron and manganese were found to be above acceptable limits in one sample taken from a homeowners well located to the east of Miramichi East and in one sample taken from a spring located to the west of Miramichi East. Also, during the month of October, 1999 a boil order was issued for all residents of Miramichi East when two of the ten supply wells tested positive for total coliform bacteria including *Escherichia coli*. Regular flushing and chlorination were required to alleviate the problem.

Past and present problems of groundwater contamination in the Miramichi area indicate a strong need for the implementation of a Wellfield Protection Program. New Brunswick is currently implementing such programs throughout the province in areas that rely heavily on groundwater. The Miramichi area is one of the latest regions to have a study performed and is now in the process of implementing the results of the study. Further geological and geochemical studies can aid in this Wellfield Protection Program.