

**Groundwater fluoride concentration levels in private water supply wells
in Annapolis Valley region, Nova Scotia**

Susan G. Jennings

Department of Geology, Acadia University, Wolfville, Nova Scotia B0P 1X0, Canada

Fluoride (F^-) is a naturally occurring inorganic species in groundwaters which has significant health implications, particularly for children. It is an essential element in human nutrition as optimum development of teeth and bone depend on its availability. A strong correlation has long been established between low levels of F^- in drinking water (and no use of dietary supplements) and increased dental caries (tooth decay) in children. More recently, concerns have been raised over situations where and when the F^- intake of children is more than optimum because of the possibility of mild or even moderate fluorosis. Fluoride supplementation or removal from drinking water may therefore be necessary in some groundwater flow system regions.

No detailed inventory and mapping of F^- concentrations in the groundwater flow systems of the eastern Annapolis Valley

region currently exists. This preliminary study of the concentration levels in groundwaters utilized for drinking water purposes from private wells has been initiated to provide base level data for this region. Fluoride concentrations were analyzed with a solid state Orion No. 9609BN selective ion (combination) electrode (calibrated with TISAB standard solutions). Electrical conductivity and pH tests were also conducted on each of the samples collected. The regional geological setting of the wells involved the Halifax, Horton Bluff and Wolfville formations.

Well owners were also questioned regarding: (1) their knowledge of the F^- concentration in their drinking water, (2) the number and ages of children consuming their well water, and (3) their knowledge of the daily F^- intake for children recommended by the Canadian Dental Association.