Bromate in Public Drinking Water Supplies using Ozone in Newfoundland and Labrador

Department of Environment and Conservation
Water Resources Management Division
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Newfoundland Labrador

1.0 **Background**

Bromide is considered a disinfection by-product precursor when ozone is utilized as a disinfectant for drinking water. Bromide reacts slowly with ozone to form hypobromous acid which can react with more ozone to form the bromate ion. The bromate ion is hence a disinfection by-product. (AWWA, 1999).

All water supplies that are treated with ozone can be at risk of bromate formation. To examine the existence and/or extent of bromate formation in public water supplies of Newfoundland and Labrador a special monitoring program was developed.

2.0 **Scheduled Sampling**

There are ten communities in Newfoundland and Labrador that utilize ozone as part of a treatment process for drinking water quality. The communities are as follows:

- Buchans
- Burgeo
- Conception Bay South
- Gander
- Mount Pearl
- Paradise
- Placentia
- Portugal Cove – St. Phillip's
- St. John's
- St. Lawrence

3.0 Water Quality Results

Samples for the ten communities that utilize ozone were sent to Maxxam Analytics Inc. for water quality analysis for bromide and bromate. The results from the sampling are shown in Table 1.

Table 1: Sample results for bromide and bromate

Community Name	Water Supply	Sample Date	Bromide (mg/L)	Bromate (mg/L)
Buchans – PWDU	Buchans Lake aka Sandy Lake	02-Nov-08	<0.05	<0.003
Burgeo	Long Pond	10-Sep-08	<0.05	<0.003
Conception Bay South	Bay Bulls Big Pond	10-Jul-08	<0.05	<0.003
Gander	Gander Lake	16-Sep-08	<0.05	<0.003
Mount Pearl	Bay Bulls Big Pond	16-Sep-08	<0.05	<0.003
Paradise	Bay Bulls Big Pond	09-Jul-08	<0.05	<0.003
Placentia	Wyses Pond	16-Sep-08	<0.05	<0.003
Portugal Cove - St. Phillip's	Bay Bulls Big Pond	10-Sep-08	<0.05	<0.003
St. John's	Bay Bulls Big Pond	10-Jul-08	<0.05	<0.003
St. Lawrence - PWDU	St. Lawrence River	10-Sep-08	<0.003	<0.05

All ten community results for both bromate and bromide were less than detection limits. Consequently, bromate is below the GCDWQ of 0.01mg/L for all communities utilizing ozone in Newfoundland and Labrador. There is currently no GCDWQ for bromide.

4.0 Path Forward

Regular water quality monitoring for bromate will not be scheduled. However, supplies that are treated with ozone will be monitored every four to five years to ensure that bromate levels remain below GCDWQ. In addition, monitoring for bromate will be considered for new water supplies that utilize ozone or any new treatment plants that implement ozone into the water treatment process.

5.0 References

American Water Works Association, 1999. *Formation and Control of Disinfection By-Products in Drinking Water.*

Health Canada, 2008. *Guidelines for Canadian Drinking Water Quality Summary Table*. Guidelines for Canadian Drinking Water Quality.