
**REPORT TO REGIONAL WATER SUPPLY COMMISSION
MEETING OF WEDNESDAY, 20 JUNE 2007**

SUBJECT 2006 ANNUAL DISINFECTION BY-PRODUCT SUMMARY OF GREATER VICTORIA'S
DRINKING WATER

PURPOSE

Provide details on the disinfection by-products in Greater Victoria's treated drinking water.

BACKGROUND

The *2006 Annual Disinfection By-Products Summary of Greater Victoria's Drinking Water* is the third report in the Water Quality Division's 2006 annual report series. This report extends the disinfection by-products information provided in the *2006 Annual Overview of Greater Victoria's Drinking Water Quality* and details the disinfection by-products results.

The annual reports are sent to individual water suppliers, the Chief Medical Health Officer and, by regulation, are made available to the public. The reports are posted on the CRD website at <http://www.crd.bc.ca/water/waterquality/annualreports.htm>.

The executive summary and selected charts from the *2006 Annual Disinfection By-Products Summary of Greater Victoria's Drinking Water* are attached. Commission members wishing to review the full report may obtain a copy by contacting Margaret Montague at CRD Water Services by phone 474-9606, or by e-mail mmontague@crd.bc.ca

RECOMMENDATION

That the Regional Water Supply Commission receive the staff report for information.

G. Stewart Irwin
Senior Manager, Water Quality

J. A. (Jack) Hull, MBA, P. Eng.
General Manager, Water Services

2006 Annual Disinfection By-Products Summary of Greater Victoria's Drinking Water

Maria Roxborough
Laboratory Supervisor
Water Quality Division

Bernie Morris
Senior Water Sampling Technician
Water Quality Division

and

G. Stewart Irwin
Manager
Water Quality Division

June 4, 2007

**WATER SERVICES
CAPITAL REGIONAL DISTRICT**
479 Island Highway
Victoria, BC

EXECUTIVE SUMMARY

The *2006 Annual Disinfection By-Products Summary of Greater Victoria's Drinking Water* is the third report in the Water Quality Division's 2006 annual report series. It extends the disinfectant and disinfection by-products information given in the *2006 Annual Overview of Greater Victoria's Drinking Water Quality* and details the disinfection by-products results across the Greater Victoria Drinking Water System paying particular attention to those areas where additional chlorine is added in the distribution system.

In this report, a distinction is made between sampling locations that receive water which has been disinfected at the Water Services' main treatment facility, Japan Gulch Treatment Plant, and sampling locations that receive water from chlorine booster stations located within the distribution system. The water at these latter locations is termed 'rechlorinated' because additional chlorine has been added at that booster station. This distinction is important because the regulations will be moving to location specific criteria rather than averaging the data from all locations into one number.

The primary observations and conclusions contained in this report are listed below:

1. **Trihalomethanes.** In 2006, the overall or combined average concentration of trihalomethanes (THMs) for the entire Greater Victoria Distribution System was 24.3 µg/L. This is well below the limit of 100 µg/L in the *Guidelines for Canadian Drinking Water Quality* and also below the Stage 2 USEPA maximum contaminant level (MCL) of 80 µg/L. Chloroform was the predominant type of THM detected.

The average concentration of THMs in the non-rechlorinated portion of the distribution system (all areas downstream of the main disinfection plant but upstream of any further chlorine additions) was 12.6 µg/L (**Figure 2b**). This is a relatively low number and the vast majority of people in Greater Victoria receive water containing this low level of THMs. The first customer sampling location just below the Japan Gulch Treatment Plant also had relatively low THMs that ranged from 2.1 to 15.0 µg/L. As expected, the rechlorinated sampling locations within the North Saanich distribution system had higher levels of THMs than the non-rechlorinated locations but did not exceed either the Canadian or the Stage 2 USEPA regulatory limits except for one instance (North Saanich, February 2006 (**Figure 3**)). The average concentration of THMs for the rechlorinated samples was 47.8 µg/L. In 2006, the highest individual concentration of THMs observed in the rechlorinated portion of the distribution system was 83.4 µg/L. This level is higher than in 2005 but similar to previous years.

2. **Haloacetic Acids.** Haloacetic acids (HAAs) were also found at relatively low levels (4.6-20.4 µg/L, average of 11.2) in the non-rechlorinated portion of the distribution system (**Figure 4**). As expected, in the rechlorinated portions of the distribution system, the levels of HAAs were significantly higher (32-94 µg/L, average of 53) (**Figure 6**). None of the sampling locations had HAA levels exceeding the World Health Organisation MCL of 100 µg/L (Canada has not established a limit for HAAs.) while both locations exceeded the USEPA Stage 2 Limit of 60 µg/L in December 2006. However, the annual average HAA for the rechlorinated locations did not exceed the USEPA Stage 2 Limit of 60 µg/L (53.9 µg/L and 52.6 µg/L). Compliance with the USEPA Stage 2 Limit is based on the annual average at each location.

RECOMMENDATION

1. Change the rechlorination process at Deep Cove Pumphouse to chloramination (chlorine and ammonia) in order to achieve the lowest possible THM and HAA concentrations without compromising the effectiveness of the water disinfection.

Figure 2b. 2006 Combined Seasonal Variation for THMs in the Greater Victoria Distribution System (Non-Rechlorinated Locations)

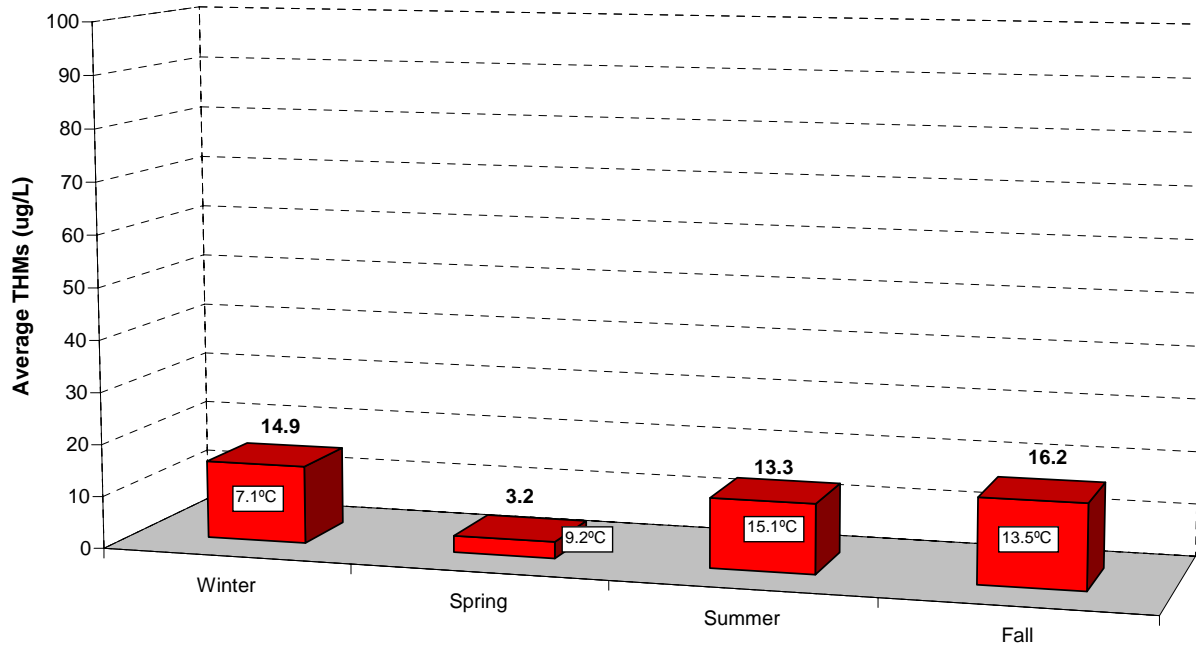


Figure 3. 2006 Trihalomethanes in Greater Victoria Distribution System (Delivery Point and Rechlorinated Locations)

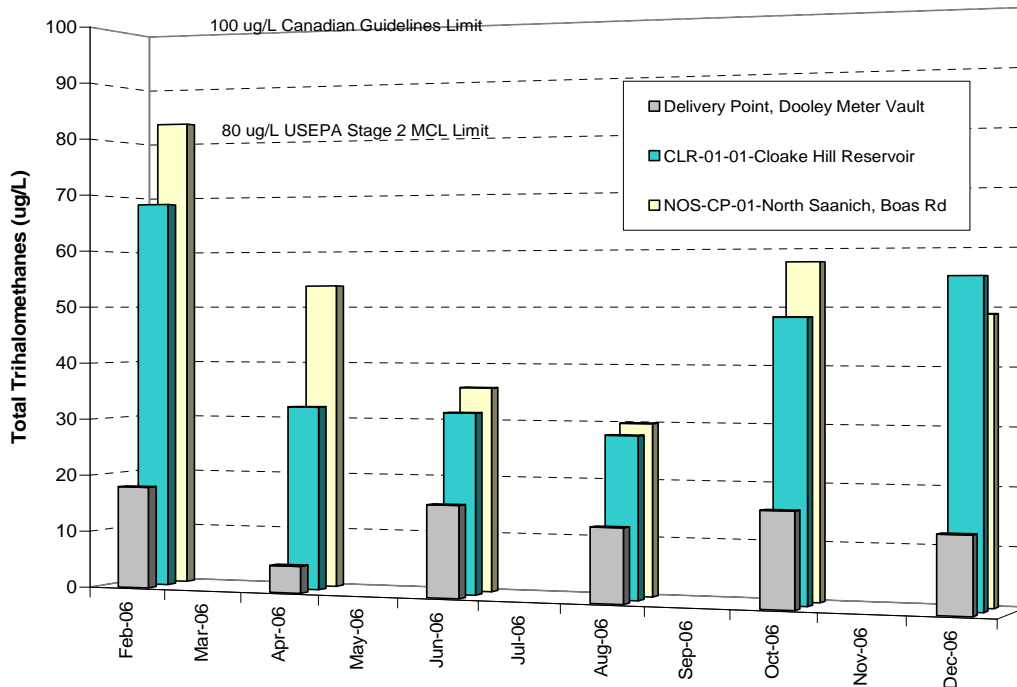


Figure 3b. 2006 Combined Seasonal Variations in THMs in Greater Victoria Distribution System (Rechlorinated Locations)

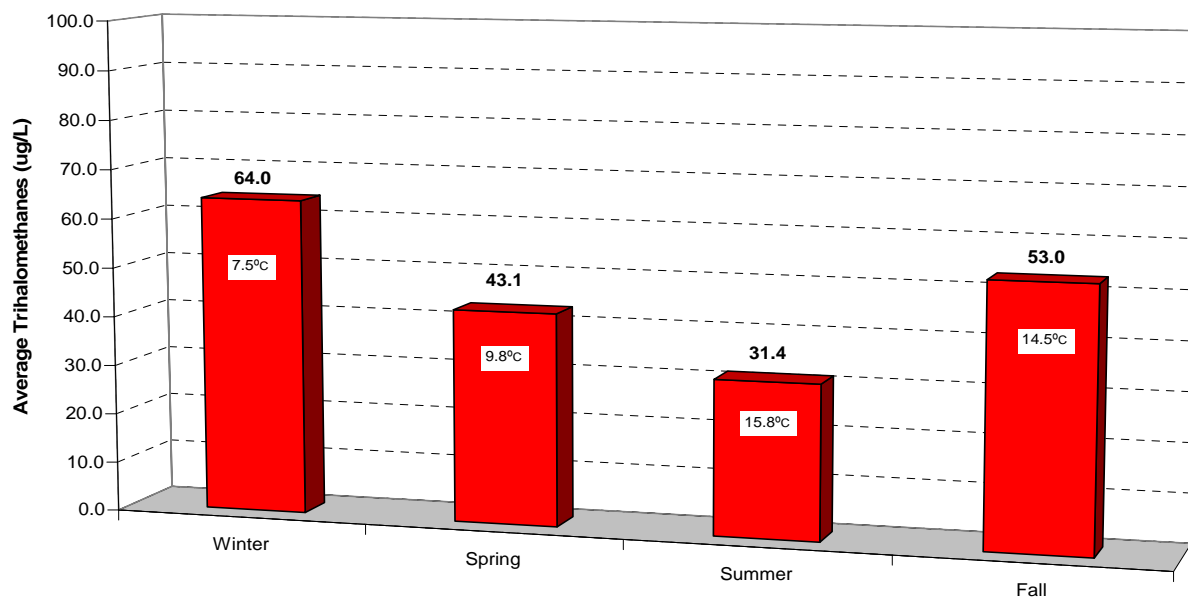
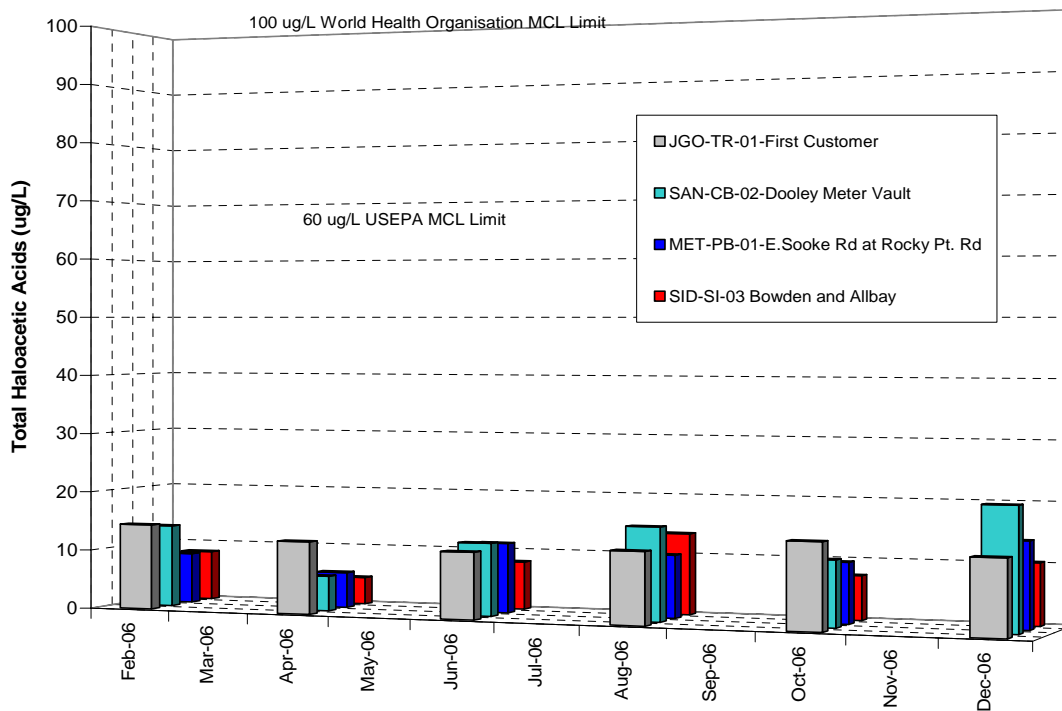


Figure 4. 2006 Haloacetic Acids in Greater Victoria Distribution System (Non-Rechlorinated Locations)



**Figure 6. 2006 Haloacetic Acids in Greater Victoria Distribution System
(Rechlorinated Locations)**

