

## Taking our water supply for granted

In November 2006 two of three water sources in the Greater Vancouver Water District system (Capilano and Seymour) were severely impaired by turbidity. Heavy rains caused a number of landslides into the reservoirs and collecting streams and rivers, and as a result, turbidity rose more than tenfold, with peak turbidity levels of 80 to 90 nephelometric turbidity units (NTU). The recommended level for tap water is 1 NTU, and 5 NTUs triggers an advisory from the water district. A boil water advisory was issued for the entire Greater Vancouver water system.

### **Real-time water quality monitoring can provide an early warning of potential problems with a water system.**

The Greater Vancouver Water District management responded by increasing to the maximum the amount of water coming into the system from the unimpaired Coquitlam reservoir and increasing levels of chlorination. After 2 days the boil water advisory was scaled back to include only Vancouver, Burnaby, and the North Shore. They also responded by shutting off the Capilano system and feeding the west half of the system exclusively from the Seymour reservoir. Although initial turbidity rates were higher in Seymour than Capilano, historical experience has indicated that turbidity rates remain high for a much longer period in the Capilano system because the silt entering that reservoir is composed of fine clay particles, which remain in suspension for a long time.

During the incident, the water coming from the Capilano and Seymour systems was highly discolored and contained visible fine silt particles, which precipitated out of the

water when the water was left standing. The water impairment lasted for approximately 10 days and there were no reported outbreaks of enteric illness. Reviews of the daily patterns of physician office visits for enteric illness for this period are currently being performed by public health staff. The public health officials in the Fraser Health Authority and the Vancouver Coastal Health Authority handled the problem effectively and professionally by monitoring the situation very carefully and issuing a precautionary boil water advisory as soon as it was clear that turbidity was present. Extensive

microbiological testing of water did not show any evidence of contamination with pathogens, although one test was positive for *E. coli*. Further testing indicated that this was most likely a false positive.

It has been known for many years that the Capilano and Seymour water systems are vulnerable to turbidity caused by logging and road building during the 1960s, 1970s, and 1980s, which resulted in exposed steep slopes and road banks. When it rains hard, landslides occur on the steep slopes and water runs on the roadways, resulting in large amounts of silt entering the systems.

The solution to the problem has also been known for many years: construction of a filtration plant. Construction of that plant commenced at the Seymour water intake station in 2005 and will be completed in 2009. The Capilano system will be connected to the filtration plant by two tunnels, one bringing the water from the

Capilano reservoir and the other taking it back to the Capilano distribution system. Those tunnels are also under construction and will be completed in 2009. Once the filtration plant and the Capilano tunnels are in place, the Vancouver water system will be much less vulnerable to turbidity incidents.

At its most recent meeting, COHP's Water Quality Subcommittee of the Environmental Health Committee decided to support and promote the improvement of water quality information, including standardization of data collection, improvement of quality of data, and the provision of practical access for users as one of its two priority projects. It was also decided to make development and implementation of real time monitoring of water quality treatment effectiveness a priority. The Water Quality Subcommittee works very closely with the British Columbia Ministry of Health on matters of water quality.

The current system for collection of water quality data is not adequate, as it does not provide the required data quickly enough or broadly enough for those who need it. The system must be standardized, upgraded, and integrated so that those requiring it can obtain data in a useable form quickly. The current method of testing water quality involves microbiological testing and, although generally effective, requires that water samples be sent to the laboratory and the results returned. This process can take up to a week, and it means there is a possibility that samples will be contaminated before they are tested, as happened on one occasion during the recent event in the Greater Vancouver water system, or that samples will be misplaced or mislabeled.

Real-time water quality monitor-

*Continued on page 94*

Continued from page 93

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Continued from page 62

ing for turbidity, chlorine residue, and other indicators of water treatment can provide an early warning of potential problems with a water system. It has many advantages over relying on traditional bacteriologic testing of drinking water. For example, readings from remote locations can be transmitted to central monitoring sites. As well, implementation of continuous real-time monitoring will provide more BC communities with appropriate early warnings of potential problems with their water systems. The provision of prompt, consistent information to the public where there are occurrences that threaten the safety of a water supply is essential.

The Water Quality Subcommittee continues to work to improve the water monitoring system to further reduce the risks of waterborne disease.

—Garth M. Evans, MD  
Chair, Water Quality Subcommittee  
Environmental Health Committee

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