

Seasonal Taste and Odor Issues

Your Water Supply

Our source of supply is both surface and groundwater supply during various times of the year. Shorelands Water Company obtains surface supply from the Swimming River Treatment Plant operated by the New Jersey-American Water Company. Shorelands also utilizes groundwater sources during the months of April through October, which tap the Old Bridge and Farrington aquifers. These sources are blended within the Shorelands Water Company distribution system. Most of the taste and odor complaints received by the Company occur in the Fall when we transition from our ground water source of supply to surface water provided by NJAW. During periods of dry weather and low reservoir levels conditions are favorable for taste and odor compounds to form.

What is T&O?

The most commonly reported taste and odor compounds, geosmin and MIB (2-methylisoborneol) are produced in aquatic environments by cyanobacteria (blue-green algae) or mold-like, filamentous bacteria called actinomycetes. Intensive testing of New Jersey American's water during T&O events has confirmed that minute concentrations (measured in parts per trillion) of these compounds create the earthy/musty taste/odor.

Geosmin, the same substance that can be detected when rich soil is turned, is also found in some foods including beets. It can be detected at very low concentrations, with the average person noticing the odor of geosmin at as little as 4 nanograms per litre (ng/L). (A trillion nanograms equal one gram) MIB is usually noticeable at levels of approximately 9 ng/L.

MIB appears to be the sole cause of T&O for Shorelands Water customers during the transition from well water to surface water each year.

T&O and Health

Taste and odor is an aesthetic objective and not a health related objective for drinking water. At the present time, no health related guidelines or regulations are known to exist for geosmin or MIB anywhere in the world. The World Health Organization Drinking Water Quality Guidelines (WHO, 1996) indicate that the taste and odor of drinking water should not be offensive to the consumer, however, no health-based guideline value is proposed. The United States Environmental Protection Agency (USEPA, 1992) has set an unenforceable secondary standard (aesthetic effect) indicating that a threshold odor number should not be exceeded (for taste and odor in general). The Australian Drinking Water Guidelines simply state that the taste and odor of drinking water should be acceptable to most people (ADWG, 1996). Similarly, the Guidelines for Canadian

Drinking Water Quality indicate that both taste and odor should be 'inoffensive' (Health Canada, 2002). Taste and odor compounds can be detected at very low concentrations, with the average person noticing the odor of geosmin at as little as 4 nanograms per litre (ng/L). (A trillion nanograms equal one gram) MIB is usually noticeable at levels of approximately 9 ng/L.

The Ames test has been widely used since the 1970s as a preliminary screening tool for potential carcinogens. Neither geosmin nor MIB is mutagenic as determined by the Ames test (Dionigi et al. 1993; Nakajima et al. 1996). The fact that neither geosmin nor MIB are mutagenic makes them unlikely candidates as potential carcinogens and has limited further research into their potential health effects. No research involving potential health effects of these two compounds has been conducted in humans.

What can you do at home?

The utilities are working intensively to understand and manage T&O. The substances that cause the T&O in drinking water, Geosmin/MIB, will dissipate from the water over time. Therefore, a loosely sealed glass container of water placed in the refrigerator overnight will provide water with less T&O.

References

Dionigi, C.P., Lawlor, T.E., McFarland, J.E. and Johnsen, P.B., 1993. Evaluation of geosmin and 2-methylisoborneol on the histidine dependence of TA98 and TA100 Salmonella typhimurium tester strains. *Wat. Res.*, 27(11), 1615-1618.

Nakajima, M., Ogura, T., Kusama, Y., Iwabuchi, N., Imawaka, T., Araki, A., Sasaki, T., Hirose, E. and Sunairi, M., 1996. Inhibitory effects of odor substances, geosmin and 2-methylisoborneol, on early development of sea urchins. *Wat. Res.*, 30(10), 2508-2511.