VERMONT
ENVIRONMENTAL CONSERVATION

GUIDANCE SHEET

Drinking Water and Groundwater Protection Division

Manganese in Drinking Water Guidance Sheet for Public Water Systems

Beginning in 2015 the Drinking Water and Groundwater Protection Division (Division) required manganese sampling at every Public **Community** and **Non-Transient Non-Community** (NTNC) drinking water system. Most Community systems were required to sample during the second quarter and most NTNC systems were required to sample during the third quarter unless manganese was already included on the system's monitoring schedule. Your system's current monitoring schedule is provided by the Division on at least an annual basis and may be accessed anytime at the following website.

What is manganese?

Manganese is a common mineral found in rocks, soil, groundwater, and some surface water in Vermont. It is a naturally occurring component of most foods and is a trace mineral in our diets. Manganese is an essential metal required for many metabolic and cellular functions. However, managing manganese in drinking water can be problematic due to aesthetic concerns and it can slowly accumulate over time in the distribution system[1]. More information about manganese in drinking water is available by visiting the Vermont Department of Health's website.

What are the health effects associated with manganese?

Low amounts of manganese are essential to good health. However, exposure to too much manganese over a long period of time could harm the nervous system. Infants and children up to 1 year old should not be given water containing elevated manganese because they have greater difficulty processing it than older children and adults. Special care should be taken to avoid making infant formula with water containing manganese above the health advisory level. The elderly and individuals with impaired liver function can also be particularly vulnerable to exposure to excess levels of manganese. The following report by EPA contains specifics regarding manganese health effects and the basis for the state health advisory level. Because of studies like these, the Vermont Department of Health and the Division have worked together to establish a Health Advisory for manganese in drinking water of 0.300 mg/L (or 300 ppb).

How is manganese regulated in drinking water?

Manganese is regulated as a secondary contaminant due to aesthetic concerns[2]. Manganese levels equal to or greater than 0.05 mg/L can lead to an unacceptable taste, discoloration, or staining of fixtures. Water systems that contain elevated manganese levels, in particular those at or above the health advisory level of 0.300 mg/L, are required to issue public notice and installation of treatment is recommended. In some cases, water systems may be required to monitor and comply with the secondary standard (or SMCL) for manganese in order to adequately protect public health and welfare[3].

How are manganese sample results managed?

Water systems must follow the monitoring schedule provided annually and updated as necessary by the Division. Manganese samples are collected from each entry point to distribution (finished water following treatment and storage) listed on the monitoring schedule[3]. Samples need to be analyzed by a laboratory that is certified by the Vermont Department of Health. A list of current certified labs is available here.

First time results for manganese in finished water that meet or exceed the health advisory level of 0.300 mg/L, require a confirmation sample. If the average of the initial sample and a confirmation sample is at or above 0.300 mg/L, or if a confirmation sample is not collected, the water system will be required to issue public notice including specific manganese health language that indicates a Do Not Drink is required for a subset of the population[4], and the water system will be placed on increased manganese monitoring. Water systems already on increased manganese monitoring that have results at or above of the health advisory level, will be required to issue public notice immediately, without waiting for a confirmation sample.

Water systems required to issue public notice need to do so within 24 hours of learning of the exceedance of the health advisory. Repeat notices shall be completed on a quarterly basis, or sooner if directed by the Division, and are required for as long as the situation exists[5].

Who can I contact for more information?
With health-effect related questions, please contact the Vermont Department of Health at 800-439-8550 or visit their website.

For questions about regulation, treatment alternatives, public notice templates, or monitoring, please contact the Drinking Water and Groundwater Protection Division (DWGPD) using our contacts page: or visit our website for more information.

Footnote 1. AWWA website - Managing manganese.

Footnote 2. A secondary contaminant means a constituent that does not have a primary drinking water standard but has a secondary maximum contaminant level (SMCL) that applies to public systems in accordance with 40 CFR Part 143.3 Secondary Maximum Contaminant Levels. These levels represent reasonable goals for drinking water quality but are not federally enforceable and intended as guidelines for the States. The SMCL for manganese is 0.05 mg/L.

Footnote 3. In accordance with Subchapter 21-6, Drinking Water Quality Requirements, Secondary Standards Section 6.13 of the Vermont Water Supply Rule.

Footnote 4. In accordance with the current DWGPD Do Not Drink Policy.

Footnote 5. In accordance with Subchapter 21-10, Public Notification, Sections 10.1 & 10.2 of the Vermont Water Supply Rule.

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