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## Manganese in City Drinking Water: Frequently Asked Questions

### What is manganese?

Manganese is a naturally occurring mineral found in the rock and soil, particularly in Minnesota. It, therefore, ends up in our drinking water and several foods like nuts, legumes, seeds and leafy vegetables. It is considered an essential nutrient because the body requires it to function properly. It is involved in the body's chemical processes like the processing of cholesterol, carbohydrates, protein and bone formation. But, too much manganese can be harmful.

### What does the guidance value mean?

The Minnesota Department of Health (MDH) develops guidance values to protect people who are most vulnerable to the potentially harmful effects of a contaminant. MDH developed a health-based guidance for manganese in drinking water of 100 parts per billion (ppb). A person drinking water at or below the guidance value would be at little or no risk for harmful health effects.

### How did the Minnesota Department of Health establish the guidance value for manganese?

MDH uses and develops guidance values to protect people's health from contaminants in groundwater used as a source of drinking water.

Based on the recent animal toxicity studies and updated risk assessment methodology, MDH calculated a water guidance value of 100 ppb or less of manganese in groundwater protects the health of infants. During the reevaluation of manganese, MDH considered the most recent scientific studies and applied updated methodology to calculate a guidance value that would be protective of infants - the population most sensitive and susceptible to manganese toxicity. This guidance is appropriate for infants who drink tap water or are fed formula mixed with tap water.

MDH has also determined that the U.S. Environmental Protection Agency lifetime health advisory of 300 ppb for manganese continues to be an appropriate level of protection for evaluating exposures and managing health risks of children and adults. This value is also protective of nursing mothers and infants.

### What are the potential health effects of manganese over 100 ppb?

Infants (babies under one year old) may develop learning and behavior problems if they drink water with too much manganese in it.

### Why is manganese between 100 and 300 ppb harmful to infants and not adults?

Infants are at greater risk from manganese in drinking water than children and adults because: their brains are developing rapidly, they absorb more manganese and are less able to remove manganese from their bodies and because they drink more water and eat more food based on body weight.

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Formula-fed infants get enough manganese from formula to meet their dietary needs. However, they may get too much manganese (above the recommended amount for nutrition) in their bodies when formula is mixed with water that contains manganese.

### **What is the difference between manganese in drinking water and manganese in infant formula or food?**

The difference is in how the manganese is absorbed by the human body. Manganese in water can be quickly and easily absorbed. Manganese in food is absorbed more slowly. Many types of food can actually block manganese from getting into the body. It's the amount of manganese in water that can pose a health concern over time.

### **Can I bathe and/or shower in City water?**

Yes. Taking a bath or showering in water with elevated levels of manganese is not harmful to your health.

### **What can I do to protect my family and myself?**

Whether or not to take action is a personal choice. The Minnesota Department of Health developed guidance values for manganese to keep your household drinking water safe. Because these are guidance values, public water systems are not required to meet these values and some do not.

If you have an infant who drinks tap water or drinks formula made with tap water, a safe level of manganese in your water is 100 ppb or less.

If you have an infant who never drinks tap water or formula made with tap water, a safe level of manganese in your water is 300 ppb or less.

If everyone in your household is more than one year old, a safe level of manganese in your water is 300 ppb or less.

Drinking water with a level of manganese above the MDH guidance level can be harmful for your health, but taking a bath or a shower in it is not. Manganese in your water can stain your laundry, cause scaling on your plumbing, and make your water look, smell, or taste bad. Manganese can also create a brownish-black or black stain on your toilet, shower, bathtub, or sink.

#### **Filtering Drinking Water**

In some cases, you may want to filter your drinking water to reduce the amount of manganese. If infants will be regularly drinking tap water or formula mixed with tap water, use a filter if manganese is detected above 100 ppb.

#### **Short-Term Bottled Water Use**

You may choose to reduce your exposure to manganese by using bottled water. For infants up to one year old who are regularly drinking water or formula mixed with water, you should use bottled water that is labeled as distilled or purified because manganese levels will be below the health-based guidance of 100 ppb. Other bottled water is likely to have manganese levels less than 300 ppb and should be suitable for household members over one year of age.