Manganese and drinking water

What is manganese?

- Manganese is a naturally occurring mineral and one of the most abundant metals on the earth's surface. Manganese is an essential nutrient, so we all need small amounts to stay healthy. However, too much manganese can negatively affect human health.

How can manganese get into water?

- Manganese can be found in many sources of drinking water including lakes, rivers and groundwater. It is normally from natural sources but can be found as a result of human activity such as mining and industrial discharges from the production of iron, steel or manganese-based chemicals.
- Manganese can also be found in drinking water.

The 'maximum acceptable value' for manganese in drinking water

- New Zealand's Drinking Water Standards lists the maximum concentration of certain substances that are acceptable in drinking water for health or other reasons. These are called Maximum Acceptable Values, or MAVs.
- The Drinking Water Standards for New Zealand sets a maximum acceptable value (MAV) of 0.4mg/L for manganese.
- Manganese has a long-term MAV. This means it has been set at a level to ensure manganese levels in drinking water won't pose a significant health risk over a lifetime (70 years). For this reason, short-term exposure to water with manganese levels above the MAV are not generally considered to pose a health risk.

What are the potential impacts of manganese in drinking water?

- Although manganese is an essential nutrient, at elevated levels it can be a health concern or cause aesthetic issues (affect colour, taste or smell).
- Exposure to manganese can affect the nervous system, for example, affecting behaviour, speech, memory and coordination.
- The impact of manganese exposure will depend on the concentration of the manganese and how long the person has been drinking water with elevated levels.
- Personal factors are also important with infants, particularly bottle-fed infants being most at risk. This is because their nervous systems are still developing,

and they absorb manganese more easily. They also consume more drinking water relative to their body weight.

- It is safe to shower and bathe in water with elevated manganese.
- Elevated manganese can also impact treatment processes for example it can reduce the amount of light passing through the water making UV treatment ineffective.

Aesthetic limits for manganese in drinking water

- Manganese in drinking water can also cause aesthetic issues like metallic-tasting water and black stains on tubs/showers, toilets, plumbing fixtures and laundry/washing.
- The New Zealand Drinking Water Aesthetic Values set a target of ≤0.04mg/L to prevent laundry staining and ≤0.1mg/L as a taste threshold for manganese in drinking water.
- Water that doesn't look or taste good may still be safe to drink. You should follow advice provided by your supplier. Do not drink water which may be unsafe, for example, untreated water from rivers, lakes or collected from roofs.

Drinking water supplier responsibilities

- All drinking water suppliers have a responsibility to ensure the water they supply is safe and meets New Zealand's Drinking Water Standards.
- Drinking water suppliers must:
    - appropriately assess their water treatment operations for risks
    - have plans in place to mitigate or manage potential risks including source water changes
    - have appropriate plans and procedures in place so that they are prepared to act quickly if incidents happen that could impact water safety.
- Whenever a supplier's drinking water exceeds a MAV, the law requires them to let us know about it, investigate the cause of the problem and take action to fix it.
- Suppliers must also advise consumers if they need to take steps to protect public health, for example, by issuing a do not drink advisory.
- Suppliers must also take reasonable steps to supply drinking water that meets the aesthetic values.
- **Domestic supplies** – if you have your own domestic supply, you are responsible for the safety and sufficiency of your supply. These supplies are not regulated under the Water Services Act but would be covered by the requirements of the

Building Act. Manganese may impact the effectiveness of domestic treatment systems such as UV. Be sure to follow the manufacturer's instruction and ensure that water is within any specified limits.

Is there manganese in my drinking water?

- Black stains on your shower, toilet, plumbing fixtures or laundry could indicate that you have elevated manganese in your drinking water. You should contact your drinking water supplier.
- You can find information about registered drinking water suppliers at https://hinekorako.taumataarowai.govt.nz/publicregister/supplies.
- If you have your own drinking water supply, it is recommended you have your water tested for bacteria and common chemicals. You can find contact details for an accredited laboratory at https://hinekorako.taumataarowai.govt.nz/publicregister/laboratories.

How can manganese be removed from water?

- Where source water has high levels of manganese, registered drinking water suppliers will normally remove this through filtration. This is easier where the manganese is in solid form. Where the manganese is dissolved, additional treatment may be required before it can be removed.
- Removing manganese from water can be difficult. If you have your own drinking water supply at home and manganese is a concern, you are advised to seek professional advice.
- Boiling water will not remove manganese.