



## Substances which may lead to health problems

A great many substances can be found in water. However, only a few of these commonly occur in concentrations high enough to be of concern to domestic water users. The most important substances to measure are those that often occur in concentrations high enough to cause health, aesthetic or other problems.

Cadmium and copper are of concern to the domestic user, but occur **less frequently at concentrations of real concern to health.**

These substances should be tested for at point of use only in areas of the country where soft water of a low pH value is used.

### Cadmium

These are common in groundwater (borehole) samples, particularly in areas of intensive agricultural activity, or where pit latrines are used. Severe toxic effects are possible in infants.

Refer to the Consumer Factsheet on: Cadmium of the U.S. Environmental Protection Agency (<http://www.epa.gov/safewater/dwh/c-ioc/cadmium.html>):

- ✓ Cadmium is a metal found in natural deposits as ores containing other elements. The greatest use of cadmium is primarily for metal plating and coating operations, including transportation equipment, machinery and baking enamels, photography, television phosphors. It is also used in nickel-cadmium and solar batteries and in pigments.
- ✓ Short-term: EPA has found cadmium to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: nausea, vomiting, diarrhea, muscle cramps, salivation, sensory disturbances, liver injury, convulsions, shock and renal failure.
- ✓ Long-term: Cadmium has the potential to cause the following effects from a lifetime exposure at levels above the MCL: kidney, liver, bone and blood damage.  
Some cadmium compounds are able to leach through soils to ground water. When cadmium compounds do bind to the sediments of rivers, they can be more easily bioaccumulated or re-dissolved when sediments are disturbed, such as during flooding. Its tendency to accumulate in aquatic life is great in some species, low in others.

### Copper

This is often elevated in groundwater in hot, arid areas. They can cause damage to the skeleton and the marking of teeth.

Refer to the Consumer Factsheet on: Copper of the U.S. Environmental Protection Agency (<http://www.epa.gov/safewater/dwh/cioc/copper.html>):

- ✓ Copper is a metal found in natural deposits as ores containing other elements. It is widely used in household plumbing materials.
- ✓ Short- and long-term effects: Copper is an essential nutrient, required by the body in very small amounts. However, EPA has found copper to potentially cause the following health effects when people are exposed to it at levels above the Action Level. Short periods of exposure can cause gastrointestinal disturbance, including nausea and vomiting. Use of water that exceeds the Action Level over many years could cause liver or kidney damage. People with Wilsons disease may be more sensitive than others to the effect of copper contamination and should consult their health care provider.
- ✓ Copper may occur in drinking water either by contamination of the source water used by the water system, or by corrosion of copper plumbing. Corrosion of plumbing is by far the greatest cause for concern. Copper is rarely found in source water, but copper mining and smelting operations and municipal incineration may be sources of contamination

References: DWAF (1998). Quality of domestic water supplies. Vol. 1: Treatment Guide. WRC No. TT 101/98.