

Well Educated



By W. Adam Sigler and Jim Bauder
Montana State University Extension Water Quality Program
Department of Land Resources and Environmental Sciences

Chromium, Mercury, and Thallium

Chromium

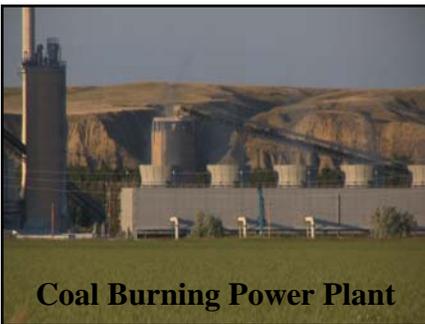
- Chromium is a grayish-white metallic element commonly occurring in nature. Chromium is used in electroplating, alloy metals, and as a corrosion inhibitor in the textile, glass, and photographic industries. Potential sources of contamination in drinking water include discharge from steel and pulp mills and erosion of natural deposits.
- The US Environmental Protection Agency (USEPA) has set a drinking water standard of 0.1 mg/L for chromium in public drinking water supplies. These regulations do not apply to private water supplies but the health implications are the same for private well owners.
- Short term (i.e. 1 day) exposure to drinking water with a chromium concentration at more than 10 times the USEPA standard is not thought to be dangerous. However, the more likely health effect from chromium comes from low dosages over a long period of time or “chronic” effects. Allergic inflammation of the skin is the primary health effect from chromium.
- Treatment of water for chromium can be accomplished with ion exchange, reverse osmosis, or distillation systems.

24	2
	8
Cr	13
	1
Chromium	
51.9961	

Mercury

- Mercury is a silver-white metallic element that is fairly uncommon in the earth’s crust. Mercury is used in thermometers, barometers, vapor lamps, mercury switches, advertising signs and in concentration of metal ores. Potential sources of contamination in drinking water include erosion of natural deposits, industrial discharge, runoff from landfills and croplands and runoff of atmospheric deposition from power plants.
- The USEPA has set a drinking water standard of 0.002 mg/L for mercury in public drinking water supplies. These regulations do not apply to private water supplies but the health implications are the same for private well owners.
- The lethal dose of mercury is approximately 3 to 30 g. It would take over 30,000 gallons of mercury contaminated water at 10 times the USEPA standard to get a 3 g dose. The more likely type of health effect from Hg comes from low dosages over a long period of time or “chronic” effects. Kidney damage is the primary health effect from mercury.
- Treatment of water for mercury can be accomplished with adsorption (i.e. carbon or charcoal), reverse osmosis, or distillation systems.

80	2
	8
	18
Hg	32
	18
	2
Mercury	
200.59	



Thallium

- Thallium is a metallic element which turns bluish-gray when exposed to air. In the past, thallium was used in rodenticide and ant killer. Thallium is also used in photocells, glass manufacturing, the electronics industry, pharmaceutical products, and to treat skin infections. Potential sources of contamination in drinking water include leaching from ore-processing sites, discharge from electronics, glass, and drug factories.
- The USEPA has set a drinking water standard of 0.002 mg/L for Thallium in public drinking water supplies. These regulations do not apply to private water supplies but the health implications are the same for private well owners.
- With long term exposure at concentrations above 0.002 mg/L, possible health effects include hair loss, changes in blood chemistry; kidney, intestinal, testicular or liver problems.
- Treatment of water for thallium can be accomplished with activated alumina or ion exchange systems.

81	2
	8
	18
Tl	32
	18
	3
Thallium	
204.3833	

Additional Resources:

Handbook of Drinking Water Quality; John DeZuane; 1997

USEPA Maximum Contaminant Levels and Fact Sheets

<http://www.epa.gov/safewater/mcl.html>