



METALS OF CONCERN FACT SHEET SERIES

LEAD

HIGHLIGHTS

- Lead is a naturally occurring element and a component of more than 200 minerals.
- Combustion of fossil fuels, smelting and natural weathering of rock are the major sources of lead in the environment.
- Radiation shields in computer monitors and medical equipment, solder, pewter objects and lead/zinc batteries are a few products that contain lead.
- Lead is a non-essential element and does not have any health benefits.
- Lead is persistent, toxic, and can be absorbed from food or through the skin. Many lead products have been phased out since the 1980s.
- Children are more susceptible than adults to the toxic effects of lead.
- A balanced diet of vitamins and minerals can reduce the toxic effects of lead.
- Lead is not found in Yukon country foods at levels of concern.

WHAT IS LEAD?

Lead is a naturally occurring element and a component of more than 200 minerals. The Yukon is host to various ore deposits that contain lead in their mineral composition. Lead has had many uses in human history but its danger to human health has only recently been widely recognized.

Lead can be a formidable contaminant as it is persistent, toxic and can be stored in the tissues of plants and animals. The Romans used lead to line city waterways and in glazes on food and wine containers. The Romans' chronic consumption of lead through contaminated drinking water, other beverages and food may have resulted in widespread lead poisoning and contributed to the fall of the Roman Empire. Members of the ill-fated Franklin Expedition to the Northwest Passage in 1845 may have suffered from lead poisoning from solder that was used to seal tin cans of preserved food.

Metallic lead is a bluish-grey soft metal that has a low melting point. Its high density and ability to block radiation, coupled with its resistance to corrosion and its readiness to form alloys and chemical compounds, have made lead a useful element for industrial products. Lead is used in solder, leaded glass and crystal, ammunition, radiation shields in computer monitors and other medical equipment, batteries, radar, jet engine blades, and fishing weights. Lead is also very easy to recycle; approximately 55% of the lead products made in Canada contain recycled lead.

Many products that contained lead have been phased out globally in the past three decades through new regulations in Canada and elsewhere. Lead solder for plumbing is no longer legal in new construction but may still be present in buildings older than 20 years. In 1978, Canadian regulations discontinued the use of lead-based paint. Most Western countries eliminated anti-knock agents in gasoline by the mid-1980s, but traces of lead still remain in roadside vegetation.

HOW DOES LEAD ENTER THE ENVIRONMENT?

Natural processes such as rock weathering and erosion, volcanoes and forest fires contribute to significant releases of lead globally. Lead mining, smelting and refining operations, along with industrial and municipal effluents, are major human-made sources of lead.

Natural rock weathering and mine waste rock leaching are the common ways that lead is released into the Yukon environment. In the 1980s, human activity releasing lead into the global environment was estimated to be 28 times greater than that of natural emissions. Since that time, global levels have decreased dramatically due to international agreements eliminating lead from products such as gasoline.

Like other metals, lead dissolves more readily in acidic waters. Sulphide in rocks or mine tailings can react with oxygen and water to produce sulphuric acid. This can increase the acidity of the water

surrounding the rock or tailings and dissolving lead and other metals. Drainage flowing downstream from these areas may harm aquatic systems.

In the atmosphere, lead can travel for considerable distances from its source by sticking to particles in air currents. It is deposited on soil, surface waters and plants through rain and snow. Movement of lead from soil into groundwater will depend on the type of lead compound and the characteristics of the soil. Plants may absorb lead from groundwater, and animals may consume lead when eating plants containing lead residue. The lead may be stored in animal tissue.

Lead has been used in pure form and as an alloy in lead shot and fishing tackle. If these recreational pieces are left in nature it can harm waterfowl and other wildlife that may ingest it. However, studies completed in the Yukon have not found elevated levels of lead from global sources in country foods.

IS LEAD TOXIC?

Lead is a non-essential element in the human diet; we do not need to eat it to be healthy. Lead is not considered to be a carcinogen, and other toxic effects can be attributed to the excess intake of lead. Short-term effects include: anaemia, a decrease in the attention span and learning ability of children, and increased blood pressure in adults. Long-term exposure can increase the risk of heart and kidney disease.

Most lead leaves the adult body a short time after short-term exposure. Children, however, are far more susceptible than adults to lead poisoning. It is important for everyone, especially children and pregnant women, to have proper nutrition. A balanced diet consisting of vitamins and minerals, especially calcium and iron, can lower the amount of ingested lead that enters the bloodstream. Good nutrition can effectively reduce the toxic effects of lead.

WHERE TO FIND MORE INFORMATION ON THE WEB:

● Health Canada

<http://www.hc-sc.gc.ca/ewh-semt/contaminants/lead-plomb/index-eng.php>
<http://www.hc-sc.gc.ca/ewh-semt/contaminants/index-eng.php>

● Environment Canada

<http://www.chemicalsubstanceschimiques.gc.ca/index-eng.php>
<http://www.ec.gc.ca/default.asp?lang=En&n=FD9B0E51-1>

● Indian and Northern Affairs Canada, Northern Contaminants Program

www.inac-ainc.gc.ca/ncp/index_e.html

● Arctic Borderlands Ecological Knowledge Society

www.taiga.net

● Government of Yukon, Environment

<http://www.environmentyukon.gov.yk.ca/monitoringenvironment/>

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- Department of Indian and Northern Affairs. (1997). *Canadian Arctic Contaminants Assessment Report*: Jensen, J., Adare, K., Shearer, R. (Eds.)
- Gamberg, M. (2008). *Arctic Caribou and Moose Contaminant Monitoring Program. Synopsis of Research*, Northern Contaminants Program 2007-2008. pp.108-113. Department of Indian and Northern Affairs, Northern Contaminants Program, Ottawa, ON. .

The Yukon Contaminants Committee co-ordinates the Northern Contaminants Program for the territory. Its members represent Canada, Yukon and the Council of Yukon First Nations, Yukon Conservation Society, and Yukon College.

Since its establishment in 1991, the Committee has acted as a link between the scientific community and Northerners on contaminants issues. Please direct any comments to the Yukon Contaminants Committee at (867) 667-3283 or toll-free 1(800) 661-0451 ext. 3283

Update date: March 2010 QS-Y343-004-EE-A1

Aussi disponible en français: QS-Y343-004-FF-A1