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**Subject: Health Canada's General Comments to the Mackenzie Valley Land and Water Board in relation to the current Water Licence Application process for the Giant Mine Remediation project.**

Dear Shannon,

I would like to thank you for providing Health Canada with the opportunity to provide some general comments to the Mackenzie Valley Land and Water Board (MVLWB) in relation to the current water licence application process for the Giant Mine Remediation project (GMRP).

Guidelines for Canadian Drinking Water Quality (GCDWQ) for arsenic and lead have been established by Health Canada in collaboration with the Federal-Provincial-Territorial Committee on Drinking Water and other federal government departments. Given that arsenic and lead have been identified as chemicals of concern at the Giant Mine site, Health Canada is providing the MVLWB with additional information pertaining to the drinking water quality guidelines for these two chemicals.

The GCDWQ are established using a risk assessment process which identifies health-based values that are protective of human health. However, for some contaminants, including both arsenic and lead, this value is not achievable and the guideline value (called the maximum acceptable concentration or MAC) is set at a higher level. Given this, Health Canada has indicated every effort should be made to ensure that the levels of lead and arsenic are kept as low as reasonably achievable (ALARA) to best protect human health. It's also important to note that the GCDWQ should not be interpreted as permitting the contamination of a water body up to the guideline level. I would suggest that you take into consideration the Water Quality Guidelines for the Protection of Aquatic Life for arsenic and lead established by the Canadian Council of Ministers of the Environment (CCME), which are lower than the corresponding GCDWQ.

Although the treated water discharged from the Giant Mine site may not be used as a direct drinking water source, Health Canada stresses the importance of using the most recent guidelines and applying the ALARA principle to the extent possible within the current scope of the project.



Some general information on the drinking water quality guidelines for arsenic and lead is provided below. In addition, links to their full technical documents are provided below for future reference and use, if desired.

### **Arsenic:**

The GCDWQ for arsenic establishes a MAC of 0.010 mg/L (10 µg/L) based on municipal- and residential-scale treatment achievability. Arsenic is considered to be a human carcinogen. The estimated lifetime cancer risk associated with the ingestion of drinking water containing arsenic at 0.01 mg/L (10 µg/L) is greater than the range that is considered generally to be essentially negligible. Accordingly, every effort should be made to maintain arsenic levels in drinking water as low as reasonably achievable.

The guideline for a carcinogen is normally established at a level where the increased cancer risk is essentially negligible when a person is exposed at that level in drinking water over a lifetime (70 years). In the context of drinking water guidelines, Health Canada has defined this term as a range from one new cancer above background per 100 000 people to one new cancer above background per 1 million people. In the case of arsenic, the health-based value that would be associated with an essentially negligible risk of cancer would be 0.3 µg/L.

The guideline technical document for arsenic can be found at the following website:  
<https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidelines-canadian-drinking-water-quality-guideline-technical-document-arsenic.html>

### **Lead:**

The GCDWQ for lead was recently updated. In considering both treatment and analytical achievability and the health risks associated with exposure to lead from drinking water, the Guideline establishes a MAC of 0.005 mg/L (5 µg/L) for total lead in drinking water. The MAC for lead is established based on feasibility rather than only health protection. As this value exceeds the drinking water concentration associated with neurodevelopmental effects in children, every effort should be made to maintain lead levels in drinking water as low as reasonably achievable.

Lead has long been known to cause a variety of health problems. Thus, many studies have documented adverse health endpoints in exposed humans and experimental animals. As environmental lead levels have declined considerably in recent times, more epidemiological data have become available on the low-dose effects of lead. These have demonstrated that lead-induced toxicities can occur at much lower exposure levels than previously estimated. In fact, the consensus in the scientific literature is that a safe level of exposure to lead in children has not been identified. Although lead has been associated with a wide array of toxicity endpoints, the strongest association observed to date is between increased blood lead levels in children and



reductions in IQ scores. The threshold below which lead is no longer associated with adverse neurodevelopmental effects cannot be identified.

The guideline technical document for lead can be found at the following website:

<https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidelines-canadian-drinking-water-quality-guideline-technical-document-lead.html>

Sincerely,

Luigi Lorusso  
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Environmental Assessment Division  
Health Canada

c.c. Brenda Woo, Alberta Regional Manager, Environmental Health Program, Regulatory Operations and Enforcement Branch, Health Canada.