

Uranium and arsenic in the baseline environment Dawson Range, Yukon

February 2021 update

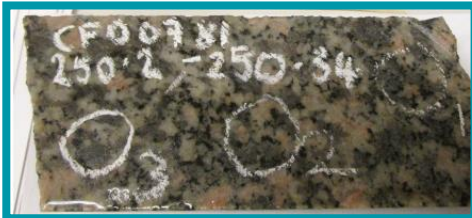
Project summary

Uranium is naturally present in surface water and groundwater in the Dawson Range region. In this latest research, we looked at what causes the release of uranium from mine waste rock in the study area. To do so, we exposed different types of rocks to water and oxygen and looked at the quality of the resulting drainage.

Results

The abundance of uranium in rocks is not always the most important factor that causes release of uranium. The results show that other factors control uranium release in alkaline (i.e., not acidic) water.

- Gneiss rock can contain carbonate minerals and uranium. When both are present, uranium release is exacerbated because dissolution of the carbonate minerals releases calcium and carbonate ions. These ions form a very stable and water-soluble molecule with uranium.
- Although granitic rocks can contain relatively higher uranium content than other Dawson Range rocks, they release less uranium than gneiss into water because they are poor in carbonate minerals.
- Rocks rich in iron oxides such as the very oxidized rock shown at left (oxidation gives it the rust coloration), are able to remove uranium from water through a process called sorption where uranium sticks onto the iron oxide surfaces.



From top to bottom: gneiss rock, granite rock and iron-oxide rich rock.

What this means for you

Water quality at mine sites can be better managed by understanding the factors controlling the release of potentially hazardous substances such as uranium.

Community partners

- Technical work was conducted through Lorax Environmental Services Ltd. in partnership with the University of British Columbia.
- The Newmont Coffee Gold Project provided waste rock samples and experimental results that were used in this study.

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Read the full research paper at: <https://www.mdpi.com/2075-163X/10/12/1104>

