Project name: Geological Mapping of Boundary Structures

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Plain Language Summary

This project involves the development of new protocols to quantify trace element and precious metal concentrations and their mobility in metamorphic rocks. The activity proposes to have a team of 5 researchers collect fist-size rock samples for two and a half weeks in July 2023 along a newly identified geological structure, the Raptor Shear Zone, about 60 km north of Rankin Inlet. The crew will be set out by helicopter from Rankin Inlet and will conduct daily short hikes along the structure to collect fist-sized rock samples, take photos and measurements, and record geological observations.

After the fieldwork, laboratory analyses will be undertaken to quantify the trace element and precious metal concentrations of collected samples. Locations of the samples will be combined with analysis results, photos, measurements, and observations where the samples were collected to create geological maps of the bedrock across the area. Mapping the distribution of elements and precious metals, relative to major geological structures, will allow us to understand how these important elements move through rocks and accumulate during deformation and metamorphism (at high temperature and/or high-pressure).

The research will contribute to the development of geological models that will help understand how ore systems form in metamorphic rocks. In general, this work will contribute to understanding the geological history of the region, including occurrence of carving stone, and how the geology of the Raptor Shear Zone relates to the geology in other parts of Nunavut. Fieldwork findings will be communicated to communities in the area, Rankin Inlet and Chesterfield Inlet. Research results will be published as public geoscience information and data that can contribute to making decisions for land use planning and economic development.