Rock Sampling

The AGS is unlocking some of Alberta's geological secrets through its whole rock lithogeochemical analysis initiative. Data collected from this work will improve our knowledge of Alberta's mineral potential, specifically for critical minerals, by producing high-quality chemical composition data for thousands of rock samples. The three digital data sets are now freely available for download.

Lithogeochemical analysis will identify if the rock has elevated base metals, precious metals, or critical minerals and the locations where these metals are elevated. In addition, the source region of the rock will determine if the area is a candidate for further investigation to assess its economic potential.

The AGS analyzed a large collection of rock samples from the AGS Mineral Core Research Facility (MCRF) in Edmonton.

Rock samples from the Canadian Shield and the Western Canadian Sedimentary Basin (WCSB) were analyzed. Shield samples were taken from the AGS Godfrey collection, which contains more than 18 000 samples collected between 1958 and 1972 in northeastern Alberta. WCSB samples are mostly from Alberta plains and were collected by past AGS teams from surface rock formations found and subsurface core. These collections have not been previously subject to extensive lithogeochemical analysis.

Whole rock lithogeochemical analysis is ongoing, and datasets will be published as they become available. Over the next few years, the AGS will analyze the datasets and produce interpretive reports and interactive maps.

Highlights

Data from this initiative will improve our knowledge of Alberta's mineral potential, specifically for critical minerals, by producing high-quality chemical composition data for thousands of rock samples.

A **lithogeochemical** analysis is often used to classify rocks based on their chemical composition. The geochemical signatures include details about the rock's origins, the environment in which they were formed, and their alteration history.

The lithogeochemical analysis includes major oxides (e.g., silicon dioxide) and trace elements (e.g., copper).

29 Cu Copper

This is the largest collection of whole rock lithogeochemistry from the Canadian Shield in Alberta.

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Thousands of rock samples from across Alberta were analyzed for whole rock lithogeochemistry. These samples were collected from the Canadian Shield in north east Alberta and from the Western Canadian Sedimentary Basin.