

Alberta's Mineral Mapping Program: Transitioning from Data Acquisition to Actionable Insight

Levi J. Knapp, Kelsey MacCormack

Alberta Geological Survey / Alberta Energy Regulator

Summary

In November 2021, the Government of Alberta released the Renewing Alberta's Mineral Future report¹ -- a strategy and action plan for Alberta to better understand, characterize, and capitalize on its untapped mineral potential. This strategy provided the Alberta Geological Survey (AGS) with the unique opportunity to initiate a massive investigation into the province's mineral, geothermal, and helium resources.

This program included the compilation and digitization of decades worth of historical data, the acquisition of several thousand rock samples, analysis of >50,000 m of core and >35,000 km² of satellite-based multispectral data, acquisition and interpretation of >1.1 million line-km of high quality airborne geophysical data (Fig. 1), geochemical analysis of brine samples from 312 wells, several weeks of field mapping in northern and southern Alberta, among other investigations.

A key objective of this program is to ensure these extensive datasets are made easily accessible to all users as free, timely, and credible public geoscience information products in a variety of formats. Following the 2024 release of new AGS and AER websites², the team is focusing on publishing important updates to key public-facing resources like the Alberta Interactive Minerals Map (AIMM) and Map 590 – Minerals of Alberta. In addition to this, many datasets and reports have either been recently released or are on the horizon, including summaries of battery metal (e.g., Vanadium) potential, a report on the critical mineral systems of the Canadian Shield in NE Alberta, and structural interpretations of Alberta's Shield and the basement underlying the sedimentary basin. Make sure to check the AGS website (<https://ags.aer.ca>) for updates on when these informative new products will be published

The Mineral Mapping Program continues to evolve alongside the dynamic global landscape of emerging resources, which has led to the kick-off of exciting new projects. Industrial waste materials globally have been identified as prospective sources for critical minerals and elements; AGS is currently investigating critical mineral occurrences associated with oil sands and coal deposits, including the industrial waste products associated with processing these materials. The AGS has also initiated extensive investigations of the basement below the Alberta basin, which will help to characterize a broad suite of resources, including rock- and brine-hosted minerals, helium, and geothermal.

This presentation will provide an overview of the Mineral Mapping Program, an update on the diverse and extensive datasets that have been collected, illustrate how this extensive collection is being made easily accessible to diverse stakeholder groups, and preview some new insights into Alberta's emerging mineral resources.

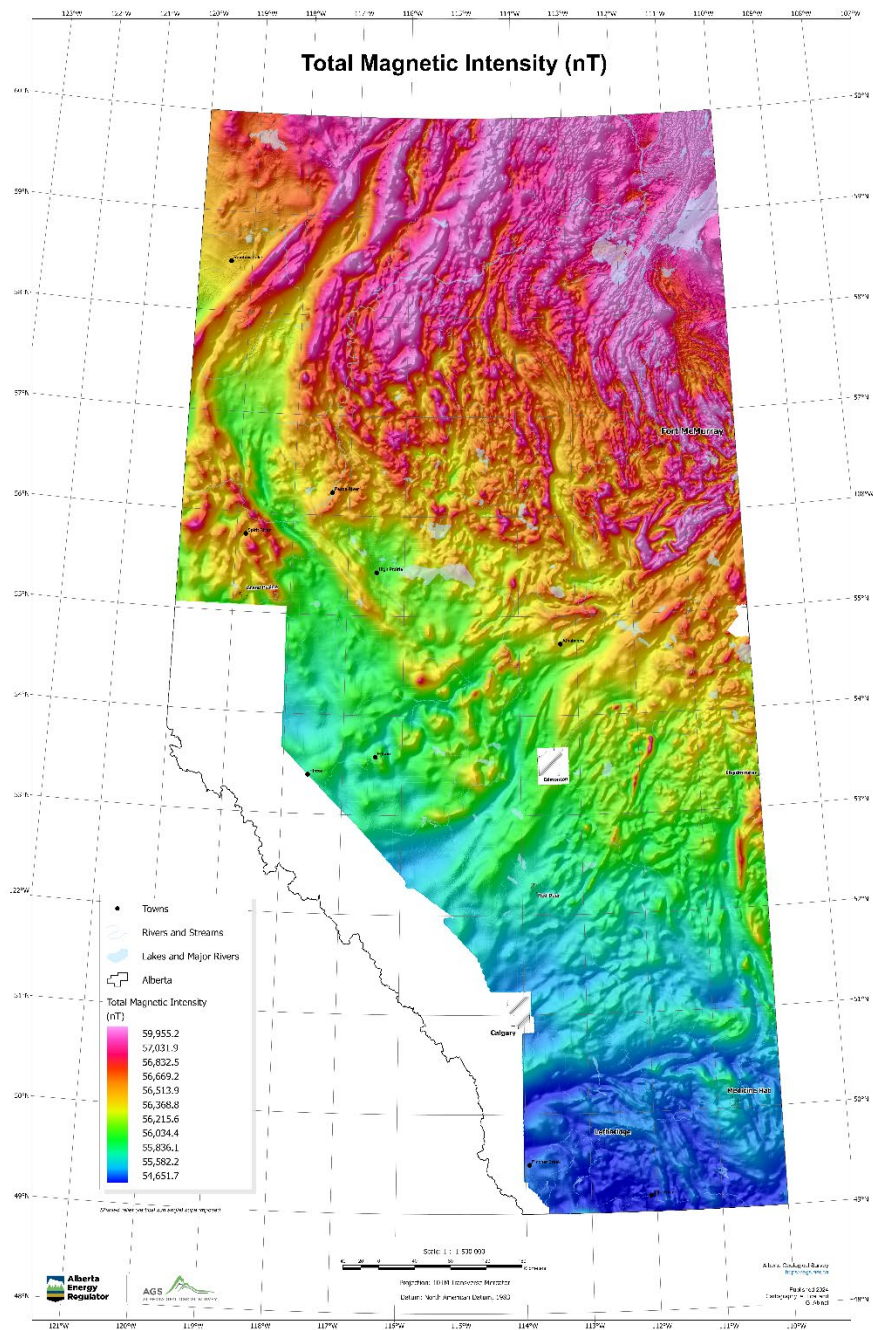


Figure 1. New high-quality airborne geophysical data (total magnetic intensity shown here) collected as part of the Mineral Mapping Program.

Acknowledgements

Thank you to the many AGS and AER staff that directly contribute to this program, including Ahmed Loai, Alex MacNeil, Andrea Pezzera, Calla Knudson, Chris Swoboda, Colin Birnie, Courtney Reimert, Dan Palombi, Dean Meek, Eric Morley, Mike Belosevic, Nancy Osei, Scott Kelly, Steven Lyster, and Subir Chowdhury.

This work was completed under the Mineral Grant provided by the Government of Alberta.

References

1. Government of Alberta, Ministry of Energy, November 2021, Renewing Alberta's Mineral Future. <https://www.alberta.ca/minerals-strategy-and-action-plan>
2. Alberta Geological Survey, 2024. Alberta Geological Survey website. <https://ags.aer.ca/research-initiatives/mineral-mapping-program>