High-Resolution UAV Magnetic Survey of the Eastern Musquodoboit Batholith, Nova Scotia

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Between February 27th and March 10th, 2026, the Geological Survey Division (GSD) of the Department of Natural Resources completed a high-resolution unmanned aerial vehicle (UAV) magnetic survey over the eastern portion of the Musquodoboit Batholith, Nova Scotia for a total of 1,230 line-kilometres (Figure 21). The survey was carried out to acquire modern geophysical data to support exploration targeting for critical minerals and mineralization associated with granitic batholith systems and adjacent metasediments.

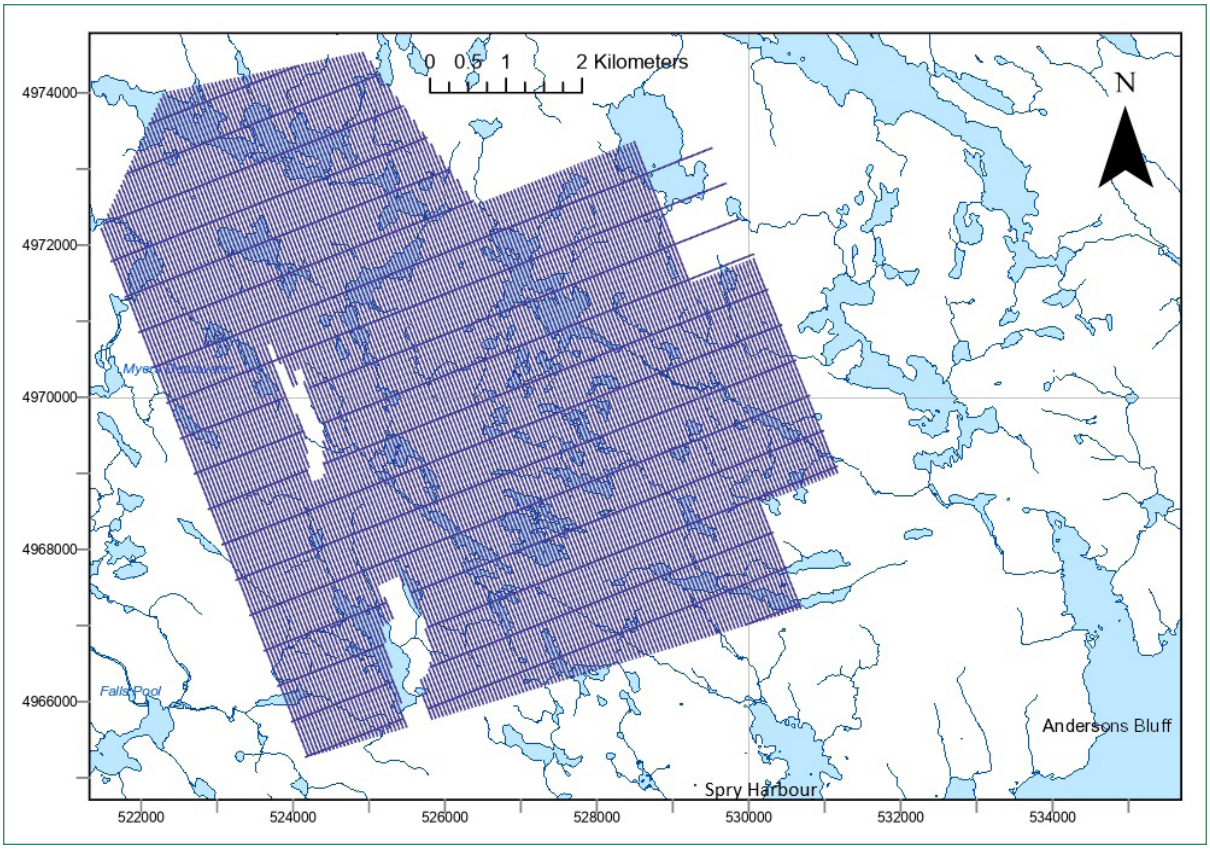

Figure 21. UAV flight-line trajectories collected during the 2026 airborne geophysical survey for a total of 1,230 line-kilometres near Tangier, Nova Scotia.

The survey targeted the eastern extent of the Musquodoboit Batholith, an area known to host tungsten mineralization identified through mapping, diamond drilling and trenching (e.g. East Lake and Tangier tungsten mineral occurrences; MacRae et al., 2024; Corey, 1994; Neyedley, 2024). At the time of the survey, the area was unstaked, presenting an opportunity for regional-scale evaluation. Survey parameters were developed to ensure detailed coverage of distinct magnetic domains, enabling effective geological and structural interpretation.

Survey acquisition was contracted to Terrascope Inc. of Québec City, Québec, who conducted both field operations and initial data handling. Two field crews were mobilized using truck and snowmobile access to support winter operating conditions. Data acquisition was completed using a Skylle 1550 MMC drone. This drone is a multi-rotor (six motors) UAV equipped with a Scintrex CS-VL cesium vapour magnetometer (2–1200 Hz range) suspended beneath the aircraft on a 5 m sling to minimize magnetic interference (Figure 22). The magnetic survey was flown at 50 m spaced lines oriented 339˚ with 500 m spaced tie-lines oriented 069˚ to align perpendicular to the strike of regional structures. The survey was flown to a mean altitude of 30 m above the ground.

Figure 22. Field photograph of UAV-based geophysical survey operations during the survey period, illustrating the drone platform and suspended sensor payload used for magnetic data collection.

Operational support included snow clearing and maintenance of access routes and designated drone launch and landing zones (LZs), which were provided by Triple B Excavating Ltd., of Sheet Harbour, Nova Scotia. Survey activities were carried out in accordance with Transport Canada UAV regulations and visual line-of-sight operational requirements (Transport Canada, 2026).

Field operations progressed efficiently until deteriorating weather and ground conditions necessitated demobilization on March 10, 2026.

Following acquisition, preliminary data processing was carried out by Devbrio Geophysics of Gatineau, Québec, while final data processing and interpretation was completed by geophysical consultant Marc Boivin, P. Geo (APGNS).

Results confirmed the presence of distinct magnetic domains corresponding to the Musquodoboit Batholith and adjacent Goldenville Group metasediments. Enhanced magnetic derivatives highlighted structural trends and geological contacts, refining the interpreted boundary between lithological units. Interpretation indicates the southern Goldenville–batholith contact is positioned approximately 1 km north of its location in previous geological mapping (Keppie, 2000). The survey identified interpreted northwest–southeast trending structural features prospective for mineralization, particularly within the southwestern extent of the survey area. These features broadly coincide with known tungsten occurrences and identify additional structural controls considered favourable for mineralization, providing high-quality targets for follow-up exploration work (Figure 23).

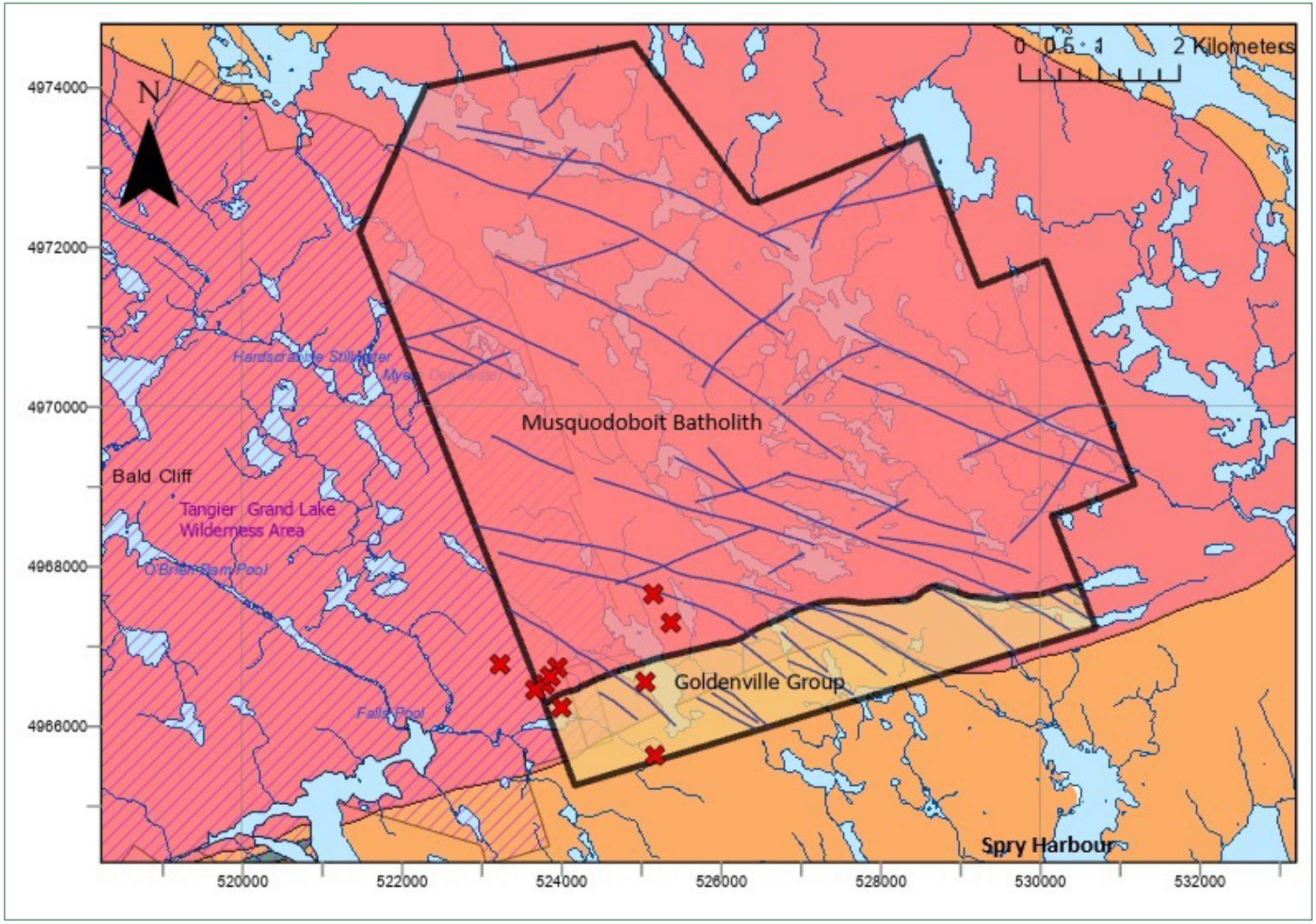

Figure 23. Geological map modified from Boivin (2026) in bold and overlain on the provincial geological map of Keppie (2000), displaying structural interpretations and the refined geological contact between the Musquodoboit Batholith and Goldenville Group metasediments constrained by magnetic survey results, west of Sheet Harbour, Nova Scotia. Existing known Tungsten mineral occurrences are indicated by red "X" symbols.

References

Boivin, M., 2026. Report and interpretation of a drone magnetic survey over the Musquodoboit Batholith. NTS 11D/15 (Tangier) Nova Scotia, Canada; Nova Scotia Department of Natural Resources, Open File Report 2026-001, 1 zip. file.

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