

QUEST-South Geophysics: New Airborne Gravity Survey in Southern British Columbia (Parts of NTS 093A, B, 092H, I, O, P, 082A, E)

K.A. Simpson, Geoscience BC, Vancouver, BC, simpson@geosciencebc.com

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Introduction

Geoscience BC's QUEST-South Project builds on the successful QUEST and QUEST-West exploration geoscience projects. The QUEST-South Project is focused on the Quesnel Terrane, south of Williams Lake, and will provide new geoscience information over an area of 130 000 km². This region of the province has been explored and mined for decades and remains one of the most actively explored and prospective areas for discovery of new Cu, Mo and Au resources in British Columbia.

Phase 1 of the QUEST-South Project includes regional geochemical surveys and a regional airborne gravity survey over an area extending south from Williams Lake to the Canada–United States border and west from Revelstoke to Pemberton (Figure 1). This paper describes the new regional airborne gravity survey undertaken in 2009. The QUEST-South regional geochemical surveys are described in Jackaman and Reichheld (2010).

Phase 2 of the project will involve adding value to the regional datasets, integrating all available data for QUEST-South area and, where necessary, the acquisition of additional new data. This phase of the project may include geophysical and geochemical modelling, deposit specific studies, data compilations, mapping and other research-oriented studies all aimed at providing industry with new geoscience information to help target their exploration efforts in this highly prospective region of BC.

Airborne Gravity Survey

The QUEST-South airborne gravity survey was undertaken by Sander Geophysics Limited using their airborne inertially referenced gravimeter (AIRGrav; Sander et al., 2004). The survey covers ~45 000 km² with a total of 25 010 line km flown. Sander Geophysics Limited used two fixed-wing aircraft to fly the survey (Figure 2). The survey was flown at 2 km line spacing in an east-west orientation

with 20 km north-south tie lines. The flights were flown at a nominal height of 200 m (above ground level) on a shallow preplanned surface smoothly draped over the topography. The survey crossed two zones, UTM zones 10 and 11, and as such the survey lines turned to accommodate the change in orientation of the UTM grid. The terrain varied from relatively flat topography in the north to mountainous in the central and southern portions of the survey (Figures 1, 3, 4).

Summary

The QUEST-South airborne gravity survey will seamlessly join with the QUEST survey in the north (Barnett and Kowalczyk, 2008; Sander Geophysics Limited, 2008). With the addition of this new QUEST-South survey, 91 000 km² covering 890 km along strike of the Quesnel Terrane has been surveyed by Geoscience BC. This provides high quality airborne gravity data to the exploration community to enhance discovery success. The QUEST-South airborne gravity data will be made available through Geoscience BC's website (<http://www.geosciencebc.com/s/DataReleases.asp>) in early 2010.

Acknowledgments

The digital elevation model in Figure 1 was prepared by K. Shimamura and F. Ma created the final figure. The manuscript benefited from reviews by P. Kowalczyk and C. Sluggett.

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Keywords: *airborne gravity, regional geophysics, Quesnel Terrane, QUEST-South Project*

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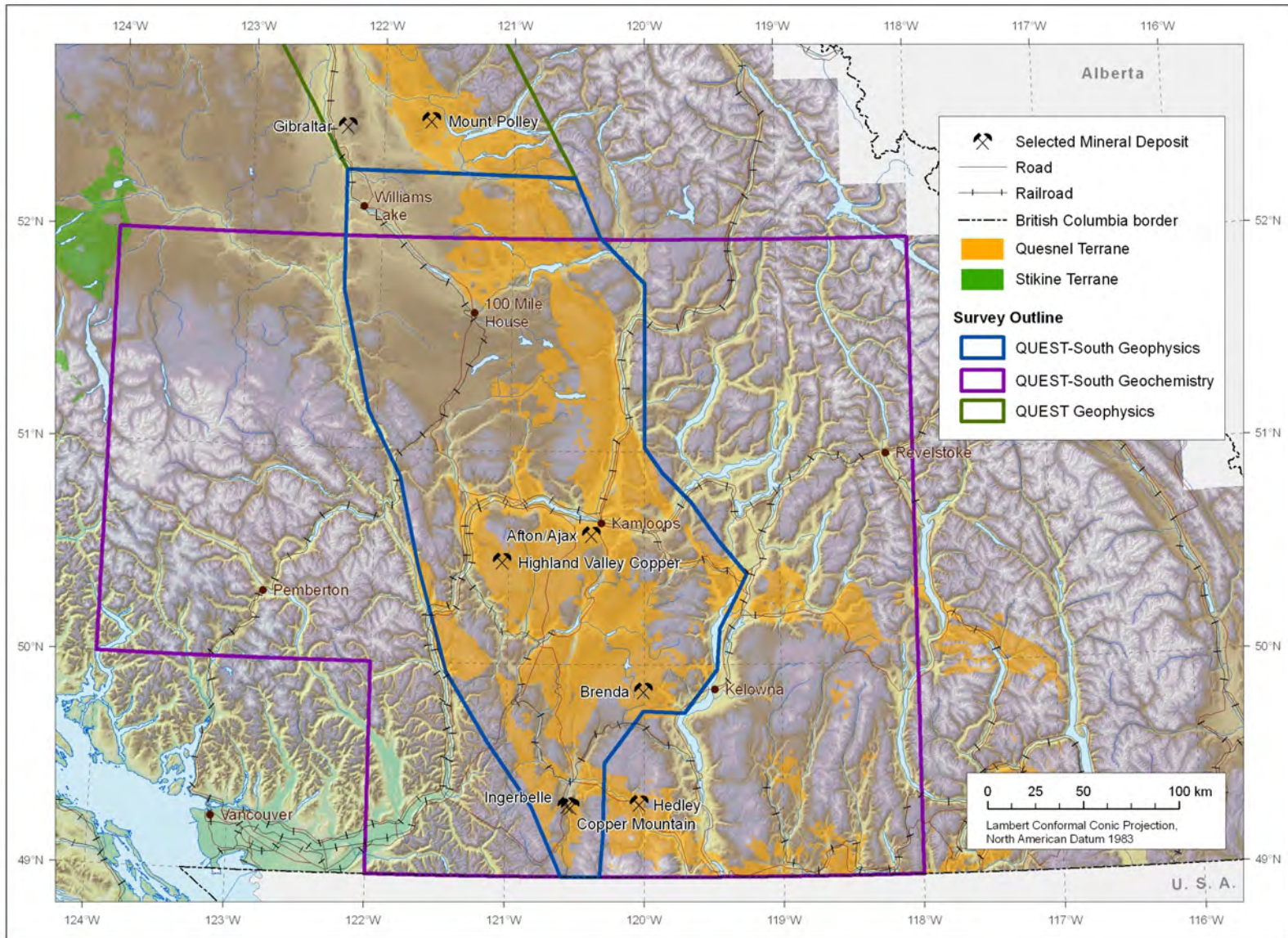


Figure 1. Location of Geoscience BC's QUEST-South geophysical and geochemical surveys. The green outline to the north shows the area of the adjoining QUEST geophysical surveys. Data from Canadian Council on Geomatics (2004), Massey et al. (2005), Natural Resources Canada (2007) and MINFILE (2009).



Figure 2. The two aircraft used in the QUEST-South airborne gravity survey, southern British Columbia, by Sander Geophysics Limited. Photo courtesy of A. MacLeary, Sander Geophysics Limited.

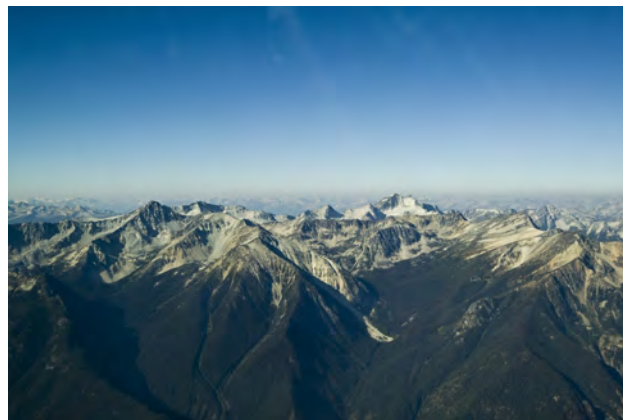


Figure 4. Mountainous terrain from the southern part of the survey area, southern British Columbia. Photo courtesy of G. Smith, Sander Geophysics Limited.

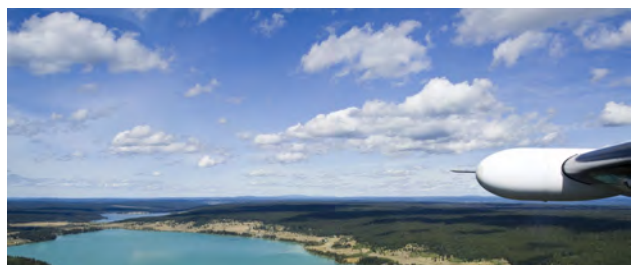


Figure 3. Relatively flat topography in the northern part of the survey area near 100 Mile House, southern British Columbia. Photo courtesy of G. Smith, Sander Geophysics Limited.

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