Aeromagnetic Survey over the Jennings River Map Area (NTS 104O), Northern British Columbia[1]

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INTRODUCTION

A high-resolution aeromagnetic survey has been completed over the 1:250 000 Jennings River map area (Fig 1; NTS 104O), northern British Columbia, has been completed. Funding for the survey was provided by Geoscience BC and project management was undertaken by the Geological Survey of Canada (GSC). The survey was flown under contract by Goldak Airborne Surveys, Saskatoon. The survey provides aeromagnetic coverage where none previously existed. The aim of the project is to spark new private sector investment in resource exploration. This objective falls within the mandate of Geoscience BC, as well as the scope of the Northern Resource Development Program of Natural Resources Canada's Earth Science Sector.

PURPOSE AND SCOPE

The Jennings River map area in northern BC is considered prospective for a number of mineral deposit types, including carbonate-hosted Ag-Pb-Zn deposits, porphyry deposits (Mo and W) and skarn deposits (Cu and Mo). In addition, the possibility of volcanogenic massive sulphide occurrences is indicated by belts containing felsic rock contemporaneous with such deposits in the neighbouring Yukon. Despite these positive factors, exploration in the region has been limited. This can be attributed, in part, to the extensive Quaternary cover, the lack of public domain geophysical data and the status of geological mapping. Although regional bedrock maps were produced for the northern half of the map area in the past decade or so (Mihalynuk *et al*., 2000, 2001; Nelson and Bradford, 1993; Nelson *et al*., 2000, 2001), mapping in the southern half of the map area dates from the 1960s and is reconnaissance in scale (Gabrielse, 1969).

Aeromagnetic surveys provide a rapid, cost-effective means of preliminary geological evaluation of large tracts of bedrock and are basic resource exploration infrastructure. The data acquired by these surveys provide information on lithology and the extent of regional rock units, help delineate fault and diking patterns and allow for the estimation of source depths. In regions of poor exposure, aeromagnetic data would be valuable for extrapolating mapped geology beneath areas of cover. Therefore, it is expected that the new data acquired in the Jennings River area will significantly advance the understanding of the geological and mineral resource potential of the area.

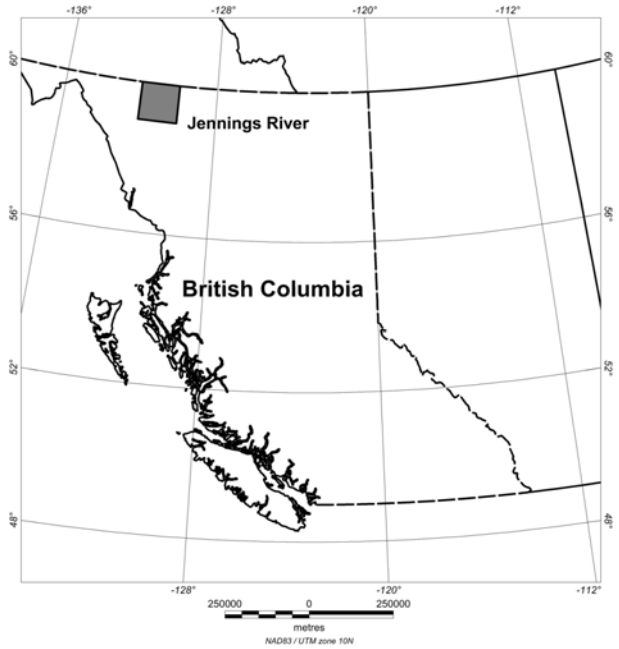

Figure 1. Location of the Jennings River map area in northern BC.

METHOD

A Request for Proposals was generated by the Geological Survey of Canada for completion of the aeromagnetic survey. The contract was awarded to Goldak Airborne Surveys of Saskatoon. Surveying began on May 15, 2006 and concluded on June 22, 2006. Two Piper PA-31 Navajo™ aircraft performed the survey, which consisted of 33 752 line km, covering all of NTS 104O. The traverse flight-line spacing was 500 m with an N45°E orientation. The control-line spacing was 2000 m with an orientation of N135°E. The survey altitude was a nominal mean terrain clearance of 150 m on a predetermined smooth draped surface. Magnetometer calibration was performed at the Meanook, Alberta test site. The magnetic data were recorded at 10 Hz using a split-beam line cesium vapour mag-

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netometer with a sensitivity of 0.01 nT, mounted on board the aircraft. The maximum tolerance for diurnal variation was 3.0 nT per minute. Flight-path information was recovered using a post-flight differential Global Positioning System.

The Regional Geophysics Section of GSC Central Canada Division performed project management, including quality assurance and quality control, for the survey. The scientific authority for the survey performed an inspection of the contractor's site as the survey began. Quality control was performed on the data as they were acquired. The data were tie-line levelled and determined to be acceptable for archiving in the Canadian Aeromagnetic Database. The processing of the data is now underway with a target completion date of December 2007, at which time the data will be available for public release.

RESULTS

Project plans call for the joint publication of sixteen 1:50 000 total field magnetic anomaly and vertical derivative maps (GSC Open Files 5351-5382 and Geoscience BC Maps 2006-3-1 to 2006-3-16 and 2006-4-1 to 2006-4-16) in late January 2007. Vertical derivative images enhance short wavelength components (shallow sources) in a dataset at the expense of longer wavelength components (deep sources) and can provide important insights into the near-surface geology.

Additionally, the digital profile and gridded data will be made available online and at no cost via the Geoscience Data Repository for Aeromagnetic Data (http:// gdr.nrcan.gc.ca/aeromag/index_e.php). Bitmap images and PDFs of the maps will be available online and at no cost via the Geoscience Data Repository's MIRAGE application (http://gdr.nrcan.gc.ca/mirage/index_e.php). Bitmap images and gridded datasets will also be available on the BC Ministry of Energy, Mines and Petroleum Resources' MapPlace (http://www.em.gov.bc.ca/mining/Geolsurv/MapPlace/).

An interpretation of the aeromagnetic data by the Geological Survey of Canada will be undertaken and the findings will be published in Spring 2007.

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