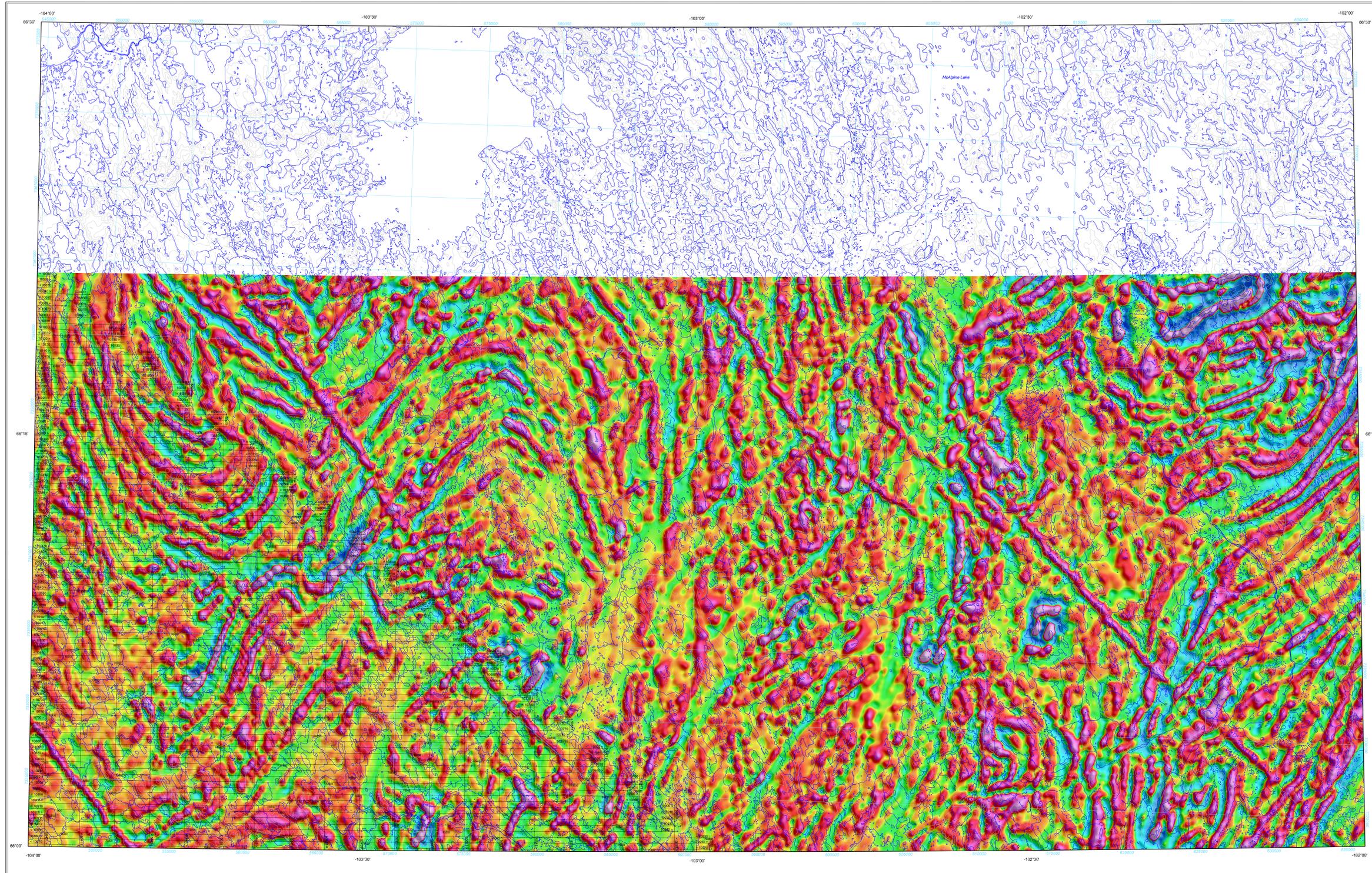


FIRST VERTICAL DERIVATIVE OF THE MAGNETIC FIELD



**First Vertical Derivative of the Magnetic Field**

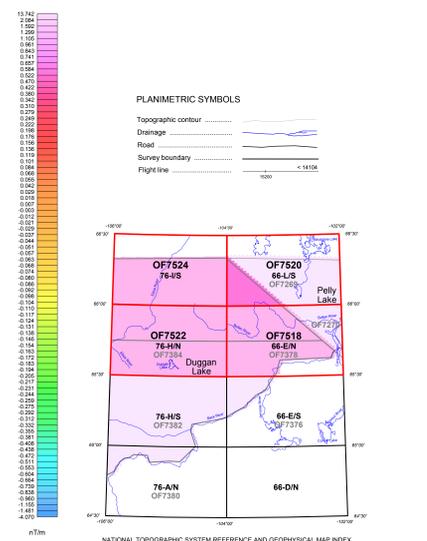
This map of the first vertical derivative of the magnetic field was derived from data acquired during an aeromagnetic survey carried out by Geo Data Solutions GDS Inc. and Oracle Geoscience International from September 21, 2012 to September 28, 2013. The data were recorded using split-beam cesium vapour magnetometers (sensitivity = 0.005 nT) mounted in each of the tail booms of two Piper Navajo aircraft (C-GSDM and C-FQGB). The nominal traverse and control line spacings were, respectively, 400 m and 2400 m, and the aircraft flew at a nominal terrain clearance of 150 m. Traverse lines were oriented E-W with orthogonal control lines. The flight path was recovered following post-flight differential corrections to the raw Global Positioning System (GPS) data and inspection of ground images recorded by a vertically-mounted video camera. The survey was flown on a predetermined flight surface to minimize differences in magnetic values at the intersections of control and traverse lines. These differences were computer-analysed to obtain a mutually levelled set of flight-line magnetic data. The levelled values were then interpolated to a 100 m grid. The International Geomagnetic Reference Field (IGRF) defined at the average GPS altitude of 432 m for the year 2013.23 was then removed. Removal of the IGRF, representing the magnetic field of the Earth's core, produces a residual component related almost entirely to magnetizations within the Earth's crust.

The first vertical derivative of the magnetic field is the rate of change of the magnetic field in the vertical direction. Computation of the first vertical derivative removes long-wavelength features of the magnetic field and significantly improves the resolution of closely spaced and superposed anomalies. A property of first vertical derivative maps is the coincidence of the zero-value contour with vertical contacts at high magnetic latitudes (Hood, 1965).

A digital version of this map can be downloaded, at no charge, from Natural Resources Canada's Geoscience Data Repository (MRADG) at [http://maps101.nrcan.gc.ca/mrads/online/index\\_e.php](http://maps101.nrcan.gc.ca/mrads/online/index_e.php). Corresponding digital profile and gridded data as well as similar data for adjacent airborne geophysical surveys are available from Natural Resources Canada's Geoscience Data Repository for Aeromagnetic data at [http://aird.geog.nrcan.gc.ca/afdr/index\\_e.html](http://aird.geog.nrcan.gc.ca/afdr/index_e.html). The same products are also available, for a fee, from the Geophysical Data Centre, Geological Survey of Canada, 615 Booth Street, Ottawa, Ontario K1A 0E9. Telephone: (613) 995-5326, email: [info@geog.nrcan.gc.ca](mailto:info@geog.nrcan.gc.ca).

**References**

Hood, P.J., 1965. Gradient measurements in aeromagnetic surveying. *Geophysics*, v. 30, p. 891-902.



TOPOGRAPHIC CONTOUR INTERVAL: 30 METRES

This aeromagnetic survey and the production of this map were funded by the Geomapping for Energy and Minerals (GEM) program of the Earth Sciences Sector, Natural Resources Canada.

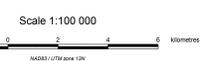
GSC OPEN FILE 7520

FIRST VERTICAL DERIVATIVE OF THE MAGNETIC FIELD

AEROMAGNETIC SURVEY OF THE DUGGAN LAKE AREA

Part of NTS 66-L/S

NUNAVUT



Author: F. Kiss

Data acquisition, data compilation and map production by Geo Data Solutions GDS Inc., Laval, Québec. Control and project management by the Geological Survey of Canada, Ottawa, Ontario.

Universal Transverse Mercator Projection  
North American Datum 1983  
© Her Majesty the Queen in Right of Canada 2014

Digital Topographic Data provided by Geomatics Canada, Natural Resources Canada



OPEN FILE  
DOSSIER PUBLIC  
7520  
2014

Recommended citation:  
Kiss, F., 2014.  
First vertical derivative of the magnetic field,  
Aeromagnetic Survey of the Duggan Lake Area,  
Part NTS 66-L/S, Nunavut,  
Geological Survey of Canada, Open File 7520,  
scale 1:100 000.

