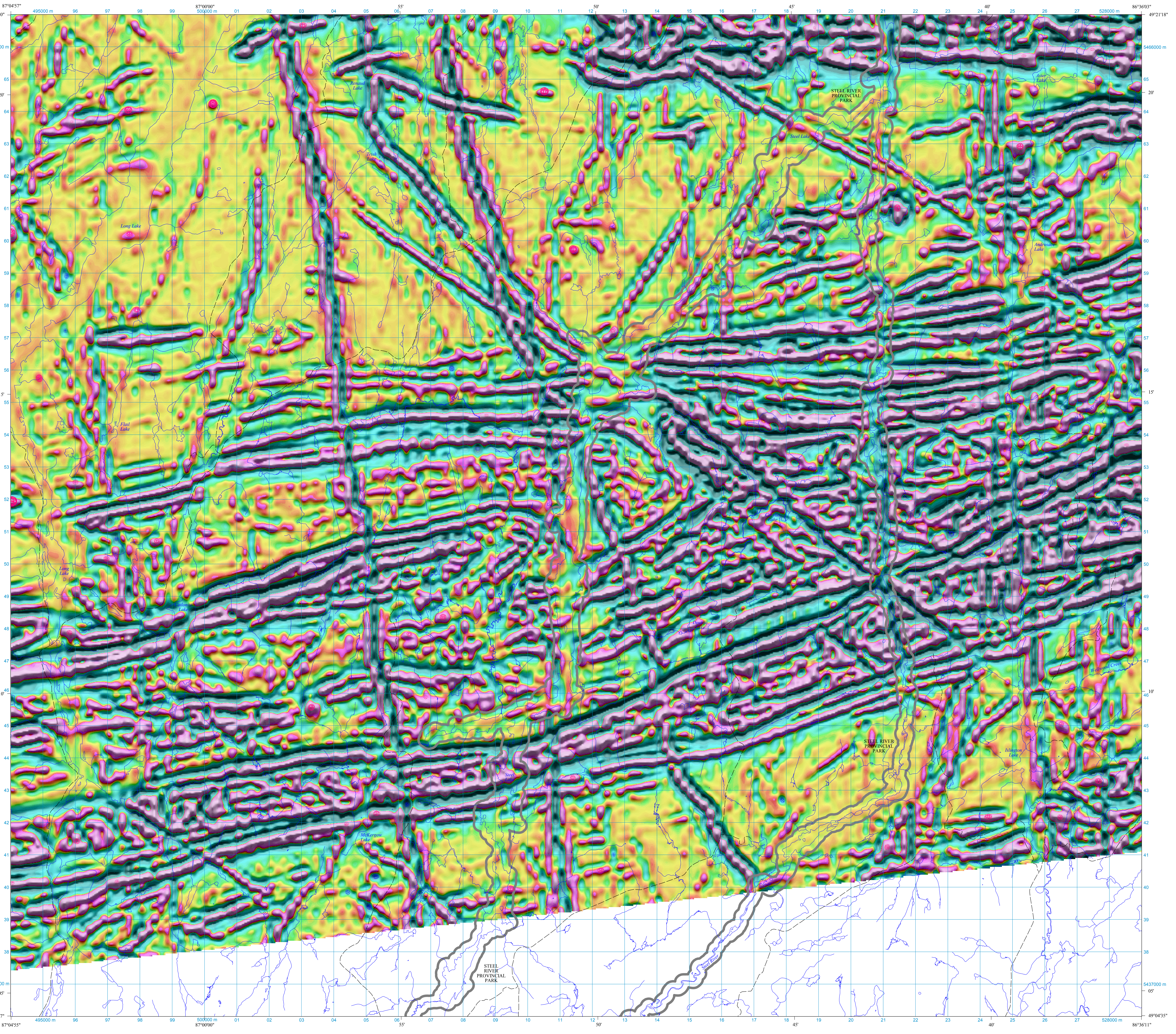


SURVEY PARAMETERS

AIRCRAFT
Type: Piper Navajo PA-31
Registration: C-GJBB, C-GJBG

MAGNETOMETER
Type: Geometrics cesium-vapour
Sensitivity: 0.005 nT
Noise level: 0.05 nT
Sample interval: 10 readings per second
Sensor locations: wingtips (transverse separation is 14.78 m)
tail stinger (longitudinal separation is 9.75 m)
Compensation: RMS AADCII
Data Acquisition: GEDAS

GAMMA-RAY SPECTROMETER SYSTEM
Type: Radiation Solutions RS-500
Downward-looking crystal volume: 33.6 L
Upward-looking crystal volume: 8.4 L
Number of channels: 1024
Sample interval: 1 reading per second
Sensor location: near centre of aircraft
Potassium window: 1370 to 1570 keV
Uranium window: 1660 to 1860 keV
Thorium window: 2410 to 2810 keV
Total count window: 410 to 2810 keV

NAVIGATION SYSTEM
GPS receiver: Novatel OEM4 ProPak
GPS sample interval: 1 reading per second
Radar altimeter: Thompson CFS 530A
Radar sample interval: 10 readings per second
Barometric altimeter: Setra 270
Barometric sample interval: 10 readings per second
Video flight path camera: Panasonic GPKR402 HRSV
Navigation-Acquisition: GEDAS

BASE STATION
Type: GEM System GSM-19W
Magnetometer sample interval: 1 reading per second
GPS sample interval: 1 reading per second

SURVEY SPECIFICATIONS
Survey date: July 18 to October 29, 2014
Nominal aircraft terrain clearance: 100 m
Traverse line spacing: 200 m
Control line spacing: 2000 m
Traverse line direction: 0 degrees
Control line direction: 90 degrees

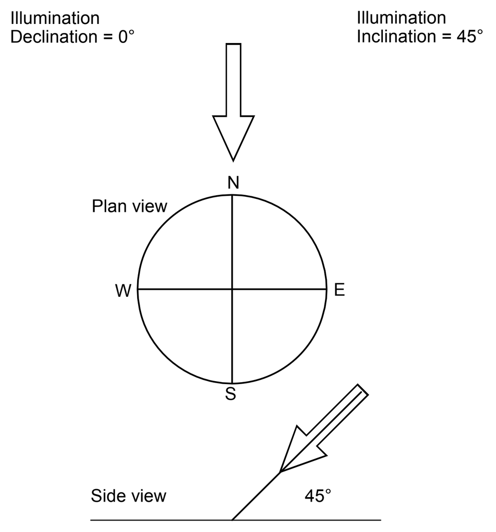
CO-ORDINATE SYSTEM
Projection: Universal Transverse Mercator
Datum: NAD83
Central meridian: 87°W (UTM zone 16N)
Central scale factor: 0.9996
False easting: 500 m
False northing: 0 m

LEGEND

KEATING COEFFICIENTS

Positive correlation		Negative correlation
○	90%	○
○	85%	○
○	80%	○
○	75%	○

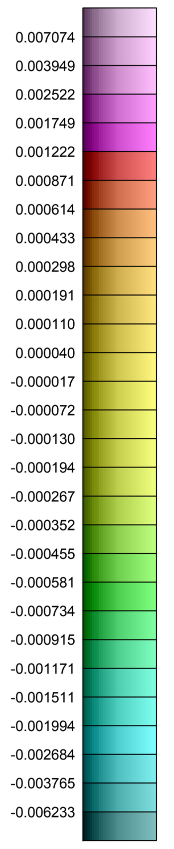
SHADED IMAGE SUN ANGLE



Shaded image is produced by applying an artificial sun illumination to the first vertical derivative of the magnetic field grid.

SECOND VERTICAL DERIVATIVE OF THE MAGNETIC FIELD GRID

nanoteslas per metre² (nT/m²)



Users of OGS products are encouraged to contact those Aboriginal communities whose traditional territories may be located in the mineral exploration area to discuss their project.

Ontario

Ontario Geological Survey

MAP 82 706

AIRBORNE MAGNETIC AND GAMMA-RAY SPECTROMETRIC SURVEYS

Shaded colour image of the second vertical derivative of the residual magnetic field and Keating coefficients

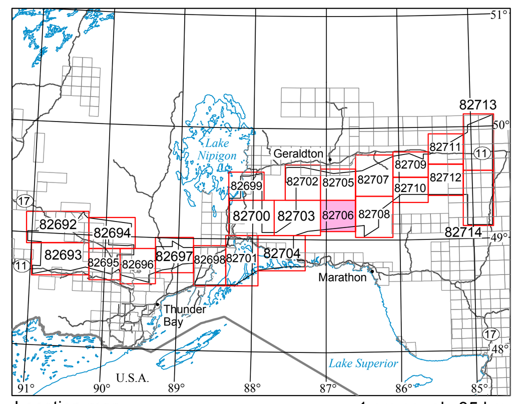
LAC DES MILLE LACS–NAGAGAMI LAKE AREA

Scale 1:50 000

1 km 0 1 2 km

NTS References: 42 E/2, 3, 6, 7

This map is published with the permission of the Director, Ontario Geological Survey.



Location map 1 cm equals 35 km

DESCRIPTIVE NOTES

Introduction

The data comprising this map are derived from the results of an airborne magnetic and gamma-ray spectrometric survey carried out by Goldak Airborne Surveys. The survey was flown using 2 Piper PA-31 Navajo aircraft. The aircraft were each equipped with 3 Geometrics magnetic sensors, Radiation Solutions gamma-ray spectrometers, GPS navigation systems and digital data acquisition systems.

Second Vertical Derivative of the Magnetic Field

The second vertical derivative of the magnetic field is the rate of change of the magnetic field in the vertical direction. Computation of the second vertical derivative removes long wavelength features of the magnetic field and significantly improves the resolution of closely spaced and superposed anomalies. The values for the second vertical derivative of the magnetic field were computed directly from the gridded gradient enhanced residual magnetic intensity data using a fast Fourier transform, combining the transfer functions of the first vertical derivative and an eighth-order Butterworth low-pass filter (250 m cut-off wavelength). The low-pass filter was aimed at attenuating unwanted high frequencies enhanced by the derivative operator.

The shaded relief parameters are:
Shading inclination: 45°
Shading declination: 0°

Keating Correlation Coefficients

Possible kimberlite targets have been identified from the residual magnetic intensity data, based on the identification of roughly circular anomalies. This procedure was automated by using a known pattern-recognition technique (Keating 1995), which consists of computing, over a moving window, a first-order regression between a vertical cylinder model anomaly and the gridded magnetic data. Only the results where the absolute value of the correlation coefficient is above a threshold of 75% were retained. The results are depicted as circular symbols, scaled to reflect the correlation value. The most favourable targets are those that exhibit a cluster of high amplitude solutions. Correlation coefficients with a negative value correspond to reversely magnetized sources. It is important to be aware that other magnetic sources may correlate well with the vertical cylinder model, whereas some kimberlite pipes of irregular geometry may not.

The cylinder model parameters are as follows:
Cylinder radius: 100 m
Cylinder length: infinite
Overburden thickness: 4 m
Field inclination: 74.6°
Field declination: -5.2°
Window size: 17 x 17 cells

SOURCES OF INFORMATION

Base map information derived from the Land Information Ontario Data Warehouse, Land Information Ontario, Ministry of Natural Resources and Forestry, scale 1:50 000.

Magnetic declination for the centre of the map area was approximately 6°8'E in 2015.

Keating, P.B. 1995. A simple technique to identify magnetic anomalies due to kimberlite pipes; Exploration and Mining Geology, v.4, no.2, p.121-125.

CREDITS

Data acquisition, data compilation and map production by Goldak Airborne Surveys, Saskatoon, Saskatchewan.

Project management and quality assurance by Paterson, Grant and Watson Limited, Toronto, Ontario.

Contract management, base maps and map surrounds by the Ministry of Northern Development and Mines, Sudbury, Ontario.

Corresponding digital data for this survey are available from the following Ontario Geological Survey publication:

Ontario Geological Survey 2015. Ontario airborne geophysical surveys, magnetic and gamma-ray spectrometric data, grid and profile data (ASCII format) and vector data, Lac des Mille Lacs–Nagagami Lake area; Ontario Geological Survey, Geophysical Data Set 1078a.

Ontario Geological Survey 2015. Ontario airborne geophysical surveys, magnetic and gamma-ray spectrometric data, grid and profile data (Geosoft® format) and vector data, Lac des Mille Lacs–Nagagami Lake area; Ontario Geological Survey, Geophysical Data Set 1078b.

Issued 2015.

Ontario Geological Survey 2015. Airborne magnetic and gamma-ray spectrometric surveys, shaded colour image of the second vertical derivative of the residual magnetic field and Keating coefficients, Lac des Mille Lacs–Nagagami Lake area; Ontario Geological Survey, Map 82 706, scale 1:50 000.