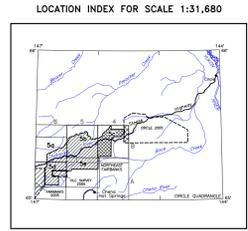


TOTAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES OF THE NORTHEAST FAIRBANKS AREA, FAIRBANKS AND CIRCLE MINING DISTRICTS, INTERIOR ALASKA

PART OF CIRCLE B-4 QUADRANGLE
by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2006



DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system and a Scintrex cesium magnetometer. The EM and magnetic sensors were flown at a height of 100 feet. In addition the survey recorded data from a radar altimeter, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS350B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (or) survey flight lines with a spacing of approximately 3 miles. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles. An Ashtech GC24 NAVSTAR / GLONASS Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 6) spheroid, 1927 North American datum using a central meridian (CM) of 147° 0' north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m, with respect to the UTM grid.

- ELECTROMAGNETIC ANOMALIES**
- Anomaly
 - Arcs indicate the conductor line or thickness >10m
 - Magnetic correction in nT
 - Dip direction
 - Interpretive symbol
 - Depth is greater than: 15 m, 30 m, 45 m, 60 m
 - Inphase and quadrature of coiled coil is greater than: 5 ppm, 10 ppm, 15 ppm, 20 ppm
 - Conductor (model): >100 siemens, 50-100 siemens, 20-50 siemens, 10-20 siemens, 5-10 siemens, 1-5 siemens, <1 siemens
 - Questionable anomaly
 - EM magnetic response
 - Conductor (model): Broad conductor, Narrow broad conductor ("thin wire"), Conductive cover ("horizontal thin sheet"), Broad conductive rock unit, Area conductive weathering, Thin conductive cover, Edge of broad conductor ("edge of roll shape"), Culture, e.g., power line, metal building or fence

ELECTROMAGNETICS

To determine the location of EM anomalies or their boundaries, the DIGHEM[®] EM system measured inphase and quadrature components of five frequencies. Two vertical coaxial-coil pairs operated at 1000 and 5000 Hz while three horizontal coplanar-coil pairs operated at 900, 7200, and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. The type of conductor is indicated on the interpretive map by the interpretive symbol attached to each EM anomaly. Determination of the type of conductor is based on EM anomaly shapes of the coiled and coplanar-coil responses, together with conductor and magnetic patterns and topography. The power line monitor and the flight track video were examined to locate cultural sources.

TOTAL MAGNETIC FIELD

The magnetic total field contours were produced using digitally recorded data from a Scintrex cesium CS2 magnetometer, with a sampling interval of 0.1 seconds. The magnetic data were (1) corrected for diurnal variations by subtraction of the digitally recorded base station magnetic data, (2) adjusted for regional variations (or IGRF gradient), 2005, updated to October 2005) using altimeter adjusted IGRF, (3) leveled to the tie line data, and (4) interpolated onto a regular 80 m grid using a modified Akima (1970) technique.

Akima, H., 1970. A new method of interpolation and smooth curve fitting based on local procedures. Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589-602.

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the new area were acquired and processed by Fugro Airborne Surveys Corp. in 2005.

This map and other products from this survey are available by mail order in person from DGGS, 3354 College Road, Fairbanks, Alaska, 99709-3707. Published maps are also available for viewing or downloading as Adobe Acrobat Files (*.pdf) on our Web site (<http://www.dggs.dnr.state.ak.us/pubs/>).