



### 40,000 Hz COPLANAR APPARENT RESISTIVITY OF THE ALASKA HIGHWAY CORRIDOR, EAST-CENTRAL ALASKA

PARTS OF MT. HAYES QUADRANGLE

by

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**DESCRIPTIVE NOTES**

The geophysical data were acquired with a RESOLVE Electromagnetic (EM) system and a Scripps 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, 60/40 Hz magnetometer and video camera. Flights were performed using AS350B-2 and AS350B-3 Squirrel helicopters at a mean terrain clearance of 200 feet along NW-SE (350°) survey flight lines with a spacing of a quarter of a mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Aantech G24 NAVSTAR / GLOPASS 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 3 m. Flight path positions were projected onto the Clarke 1858 UTM zone 61 (square, 12° North American datum) using a central meridian (CM) of 147°, a north constant of 0 and an east constant of 550,000. Positional accuracy of the presented data is better than 10 m, with respect to the UTM grid.

**RESISTIVITY**

The RESOLVE EM system measured inphase and quadrature components at six frequencies. One vertical coplanar coil pair operated at 3300 Hz with the horizontal coplanar coil pairs operated at 400, 1800, 8200, 40000 and 140000 Hz with a period of 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 40,000 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 60 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, p. 464-480.

**RESISTIVITY ALTITUDE LIMITS**

In areas where the EM bird height exceeded 100 m, and the inphase and quadrature signals were below 3 ppm, the resistivity was not calculated and the grid is blank. This avoids meaningless resistivity calculations due to small signals in areas where the helicopter flew higher to avoid cultural objects or for safety reasons.

**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 (DGGG), and Stevens Exploration Management Corp. Airborne geophysical data for the new area were acquired and processed by Fugro Airborne Surveys Corp. in late 2005 and early 2006.

This map and other products from this survey are available by mail order or in person from DGGG, 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.dggg.dnr.state.ak.us/pubs/>).

