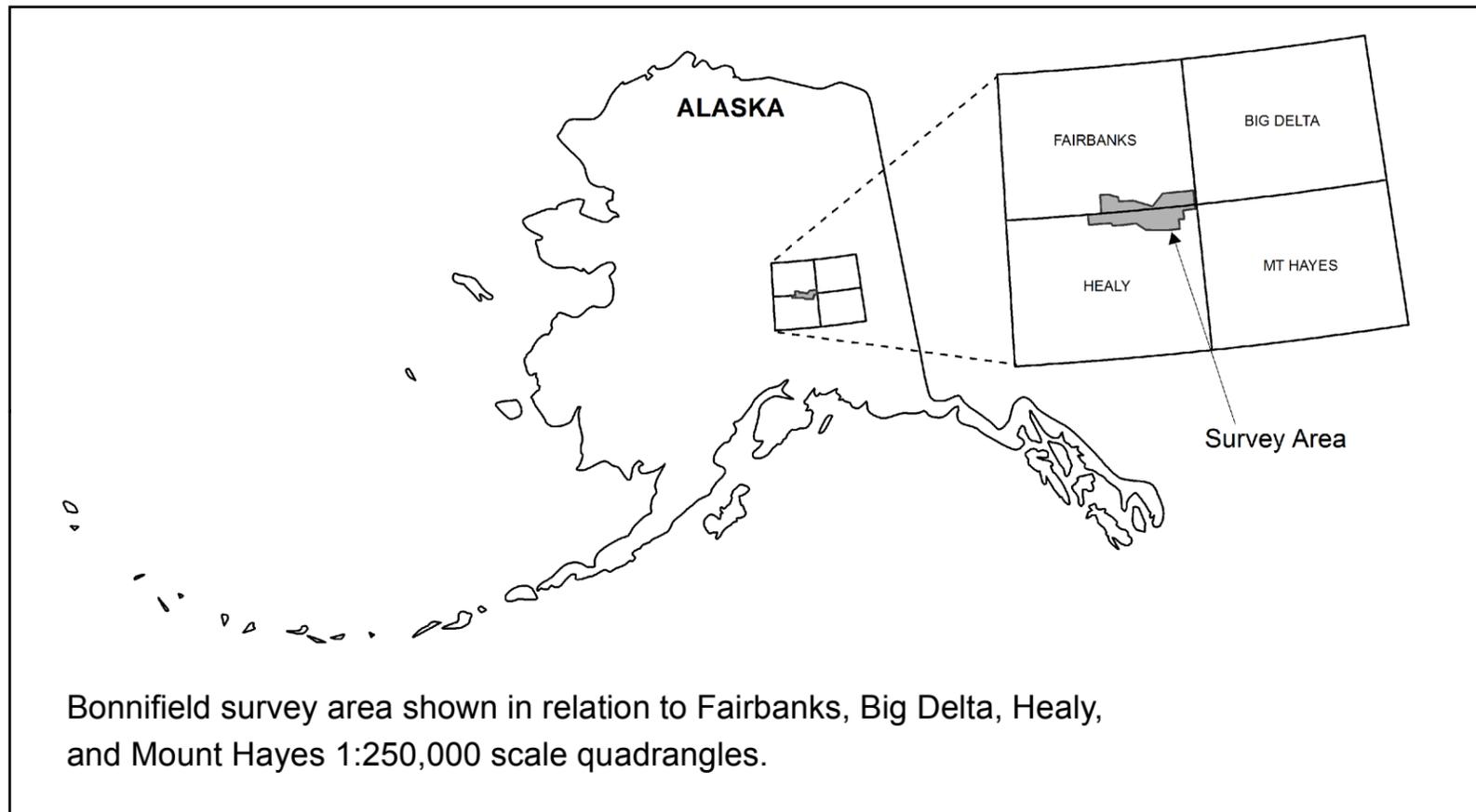
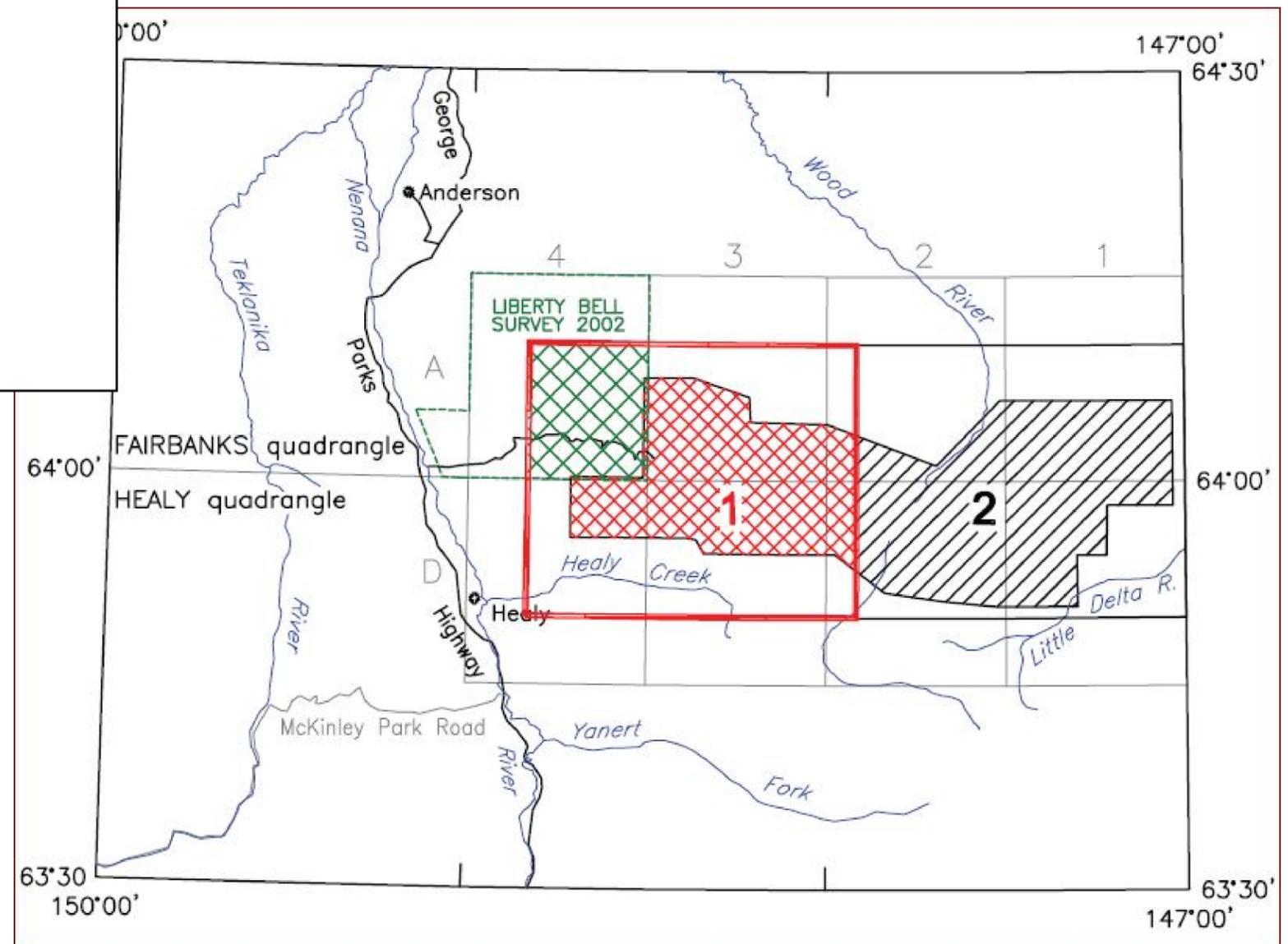


# Bonnifield electromagnetic and magnetic airborne geophysical survey data compilation

State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys, and  
Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.  
<http://dx.doi.org/10.14509/29557>



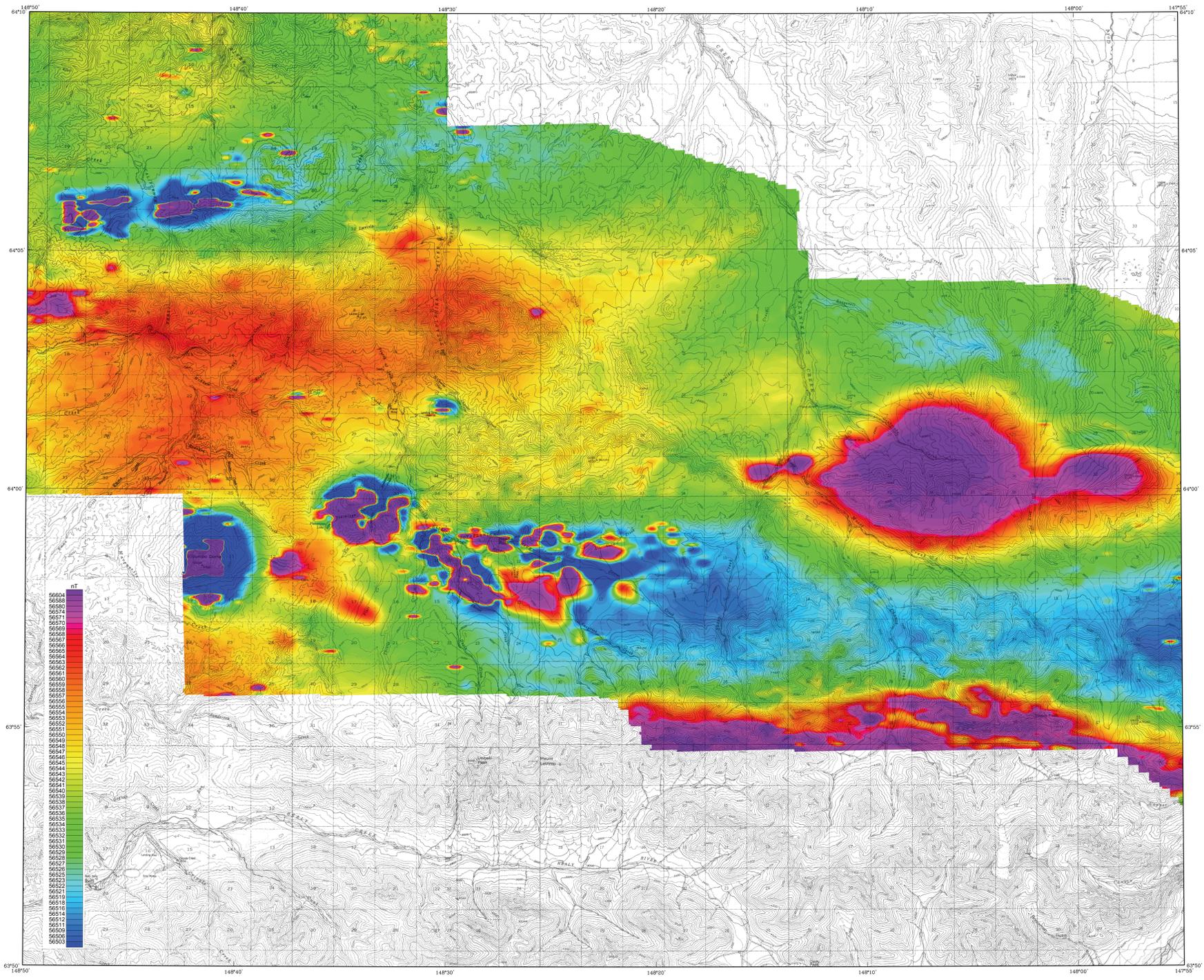
Bonnifield survey area shown in relation to Fairbanks, Big Delta, Healy, and Mount Hayes 1:250,000 scale quadrangles.



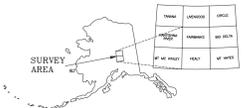
Bonnifield survey location map. Showing the Bonnifield survey area (red hatched and black striped), Liberty Bell survey area, highways, rivers and relevant quadrangle boundaries.

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4	Geophysical Report 2007-1-1A	bonnifield_sim_magtf_topo_map_2of2.pdf	Total magnetic field of part of the Bonnifield mining district, Interior Alaska	Simulated total magnetic field with topo	1:63360
5	Geophysical Report 2007-1-1B	bonnifield_sim_magtf_contours_trs_map_1of2.pdf	Total magnetic field of part of the Bonnifield mining district, Interior Alaska	Simulated total magnetic field with section grid and mag contours	1:63360
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12	Geophysical Report 2007-1-2B	bonnifield_res56khz_contours_trs_map_2of2.pdf	56,000 Hz coplanar apparent resistivity of part of the Bonnifield mining district, Interior Alaska	56000 Hz resistivity with section grid and resistivity contours	1:63360
13	Geophysical Report 2007-1-3A	bonnifield_res7200hz_topo_map_1of2.pdf	7200 Hz coplanar apparent resistivity of part of the Bonnifield mining district, Interior Alaska	7200 Hz with topo	1:63360
14	Geophysical Report 2007-1-3A	bonnifield_res7200hz_topo_map_2of2.pdf	7200 Hz coplanar apparent resistivity of part of the Bonnifield mining district, Interior Alaska	7200 Hz with topo	1:63360
15	Geophysical Report 2007-1-3B	bonnifield_res7200hz_contours_trs_map_1of2.pdf	7200 Hz coplanar apparent resistivity of part of the Bonnifield mining district, Interior Alaska	7200 Hz resistivity with section grid and resistivity contours	1:63360
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20	Geophysical Report 2007-1-4B	bonnifield_res900hz_contours_trs_map_2of2.pdf	900 Hz coplanar apparent resistivity of part of the Bonnifield mining district, Interior Alaska	900 Hz resistivity with section grid and resistivity contours	1:63360
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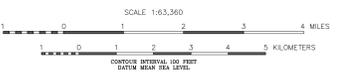
Base from U.S. Geological Survey Partials A-2, 1972; A-3, 1972; A-4, 1972; Heavy D-2, 1965; D-3, 1965; D-4, 1970; Geophysical, Alaska



**DESCRIPTIVE NOTES**

The geophysical data were acquired with a DIGHEM<sup>®</sup> Electromagnetic (EM) system and a Fugro D1344 cesium magnetometer with a Scintrex CS3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. In addition the survey recorded data from a rotor altimeter, GPS navigation system, 30/60 Hz monitors and video camera. Flights were performed with an AS350B-3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (0°) 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.

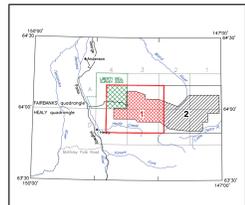
A Novatel OEM4-C2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5m. Flight path positions were projected onto the Clarke 1866 (UTM zone 6) spheroid, 1927 North American datum using a central meridian (CM) of 147° 7' north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10m with respect to the UTM grid.



**TOTAL MAGNETIC FIELD  
OF PARTS OF THE BONNIFIELD MINING DISTRICT,  
INTERIOR ALASKA**

**PARTS OF FAIRBANKS and HEALY QUADRANGLES**  
by  
**Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.**  
2007

**LOCATION INDEX**



**TOTAL MAGNETIC FIELD**

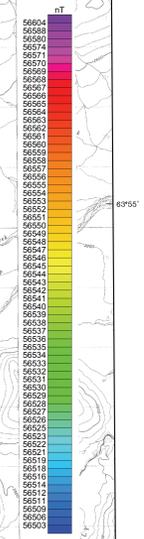
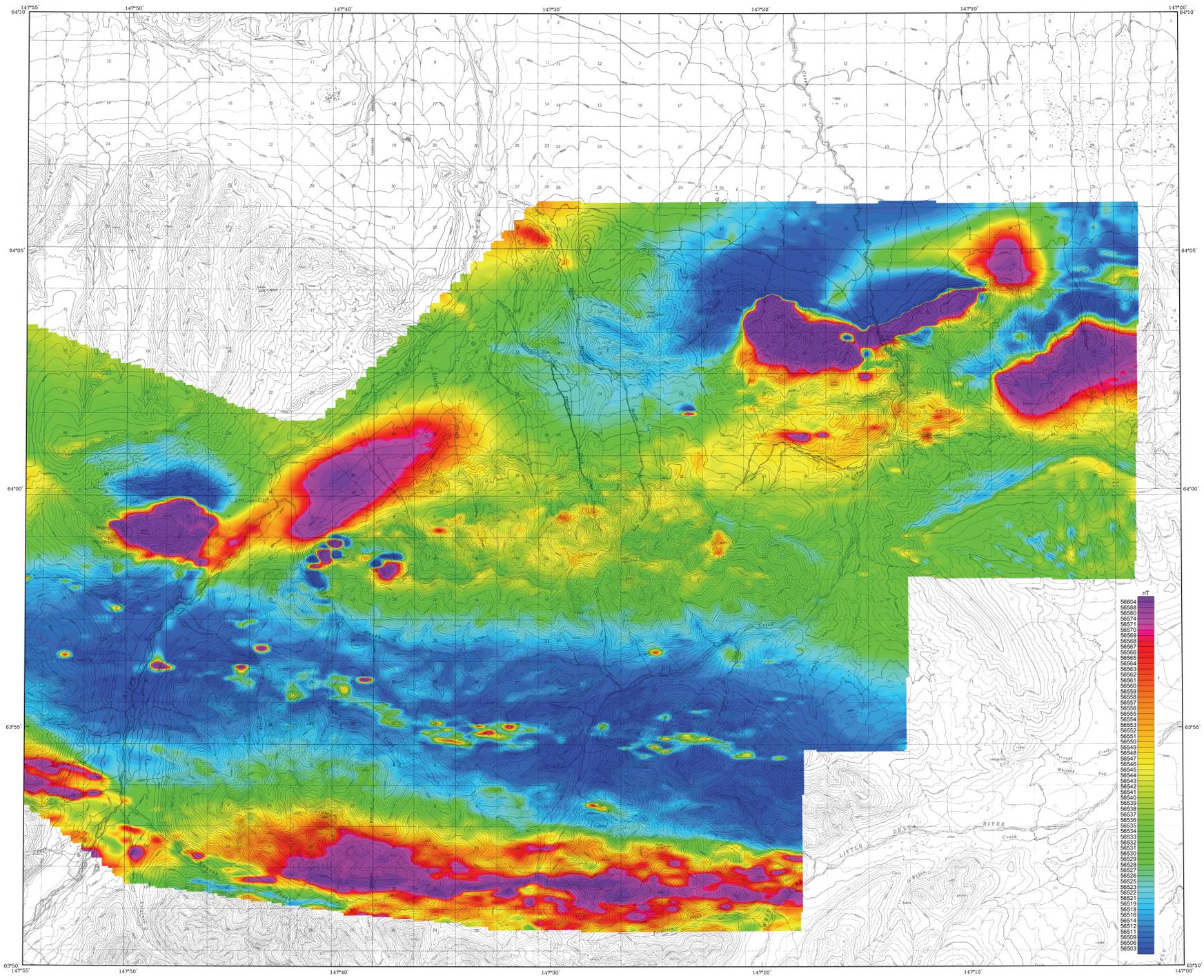
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Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures, *Journal of the Association of Computing Machinery*, v. 17, no. 4, p. 589-602.

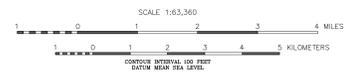
**SURVEY HISTORY**

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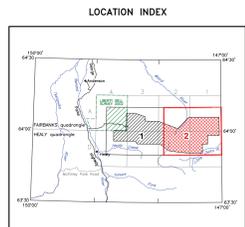


Map from U.S. Geological Survey, Fairbanks A-1, 1948; A-2, 1972; Healy Q-1, 1976; Q-2, 1978, Washington, Alaska



## TOTAL MAGNETIC FIELD OF PARTS OF THE BONNIFIELD MINING DISTRICT, INTERIOR ALASKA

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**TOTAL MAGNETIC FIELD**

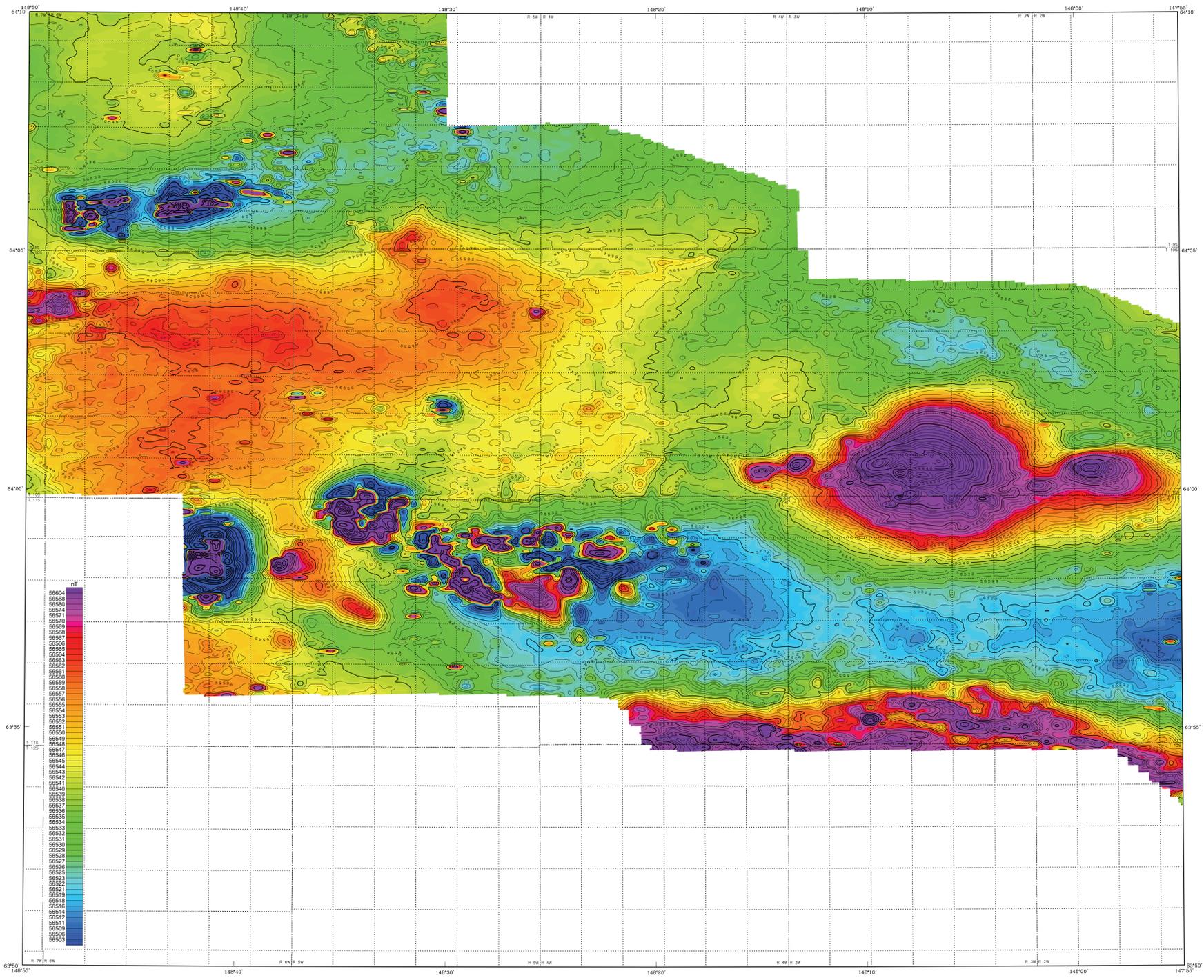
The magnetic total field data were processed using digitally recorded data from a Fugro D1344 cesium magnetometer with a Scintrex CS3 sensor. Data were collected at a sampling interval of 0.1 seconds. The magnetic data were (1) corrected for diurnal variations by subtraction of the digitally recorded base station magnetic data, (2) adjusted for regional variations (or IGRF gradient, 2005, updated to November 2006) using kilometer adjusted IGRF, (3) leveled to the tie line data, and 4) interpolated onto a regular 80 m grid using a modified Akima (1970) technique.

Alkins, 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.

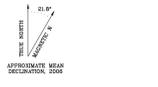
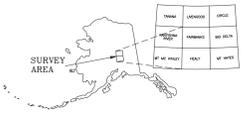
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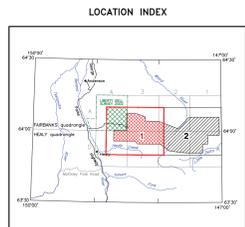


Section outlines from U.S. Geological Survey Fairbanks, A-2, 1972; A-3, 1972; A-4, 1972; Healy, D-2, 1965; D-3, 1966; D-4, 1970; Goodwin, Alaska



## TOTAL MAGNETIC FIELD OF PARTS OF THE BONNIFIELD MINING DISTRICT, INTERIOR ALASKA

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by  
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2007



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A Novatel OEM4-C2L 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 5m. Flight path positions were projected onto the Clarke 1846 (UTM zone 6) spheroid, 1927 North American datum using a central meridian (CM) of 147° 30' north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10m with respect to the UTM grid.

**TOTAL MAGNETIC FIELD**

The magnetic total field data were processed using digitally recorded data from a Fugro D1344 cesium magnetometer with a Scintrex CS3 sensor. Data were collected at 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 November 2006) using allimeter 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.

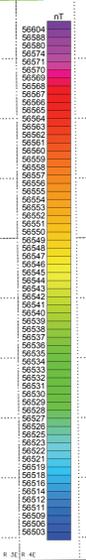
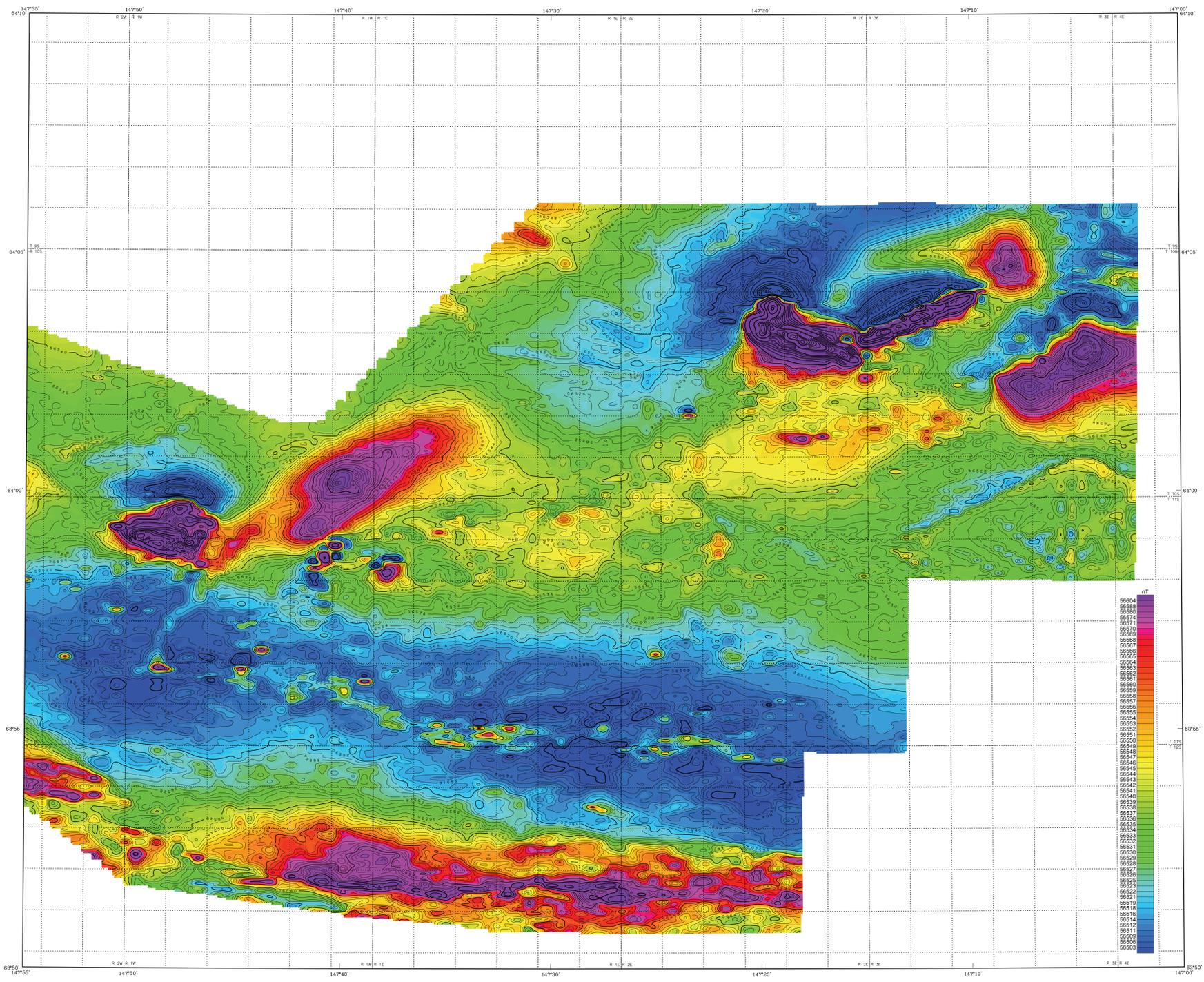
**MAGNETIC CONTOUR INTERVAL**

.....	100 nT
-----	20 nT
-----	4 nT
-----	2 nT

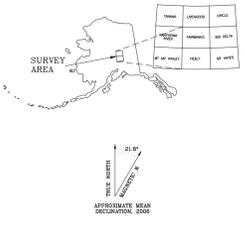
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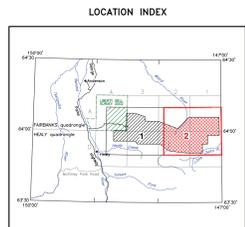


Section outline from U.S. Geological Survey Fairbanks A-1, 1949; A-2, 1972; Healy D-1, 1976; D-2, 1980; Shelburne, Alaska



## TOTAL MAGNETIC FIELD OF PARTS OF THE BONNIFIELD MINING DISTRICT, INTERIOR ALASKA

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**DESCRIPTIVE NOTES**

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**TOTAL MAGNETIC FIELD**

The magnetic total field data were processed using digitally recorded data from a Fugro D1344 cesium magnetometer with a Scintrex CS3 sensor. Data were collected at 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 November 2006) 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.

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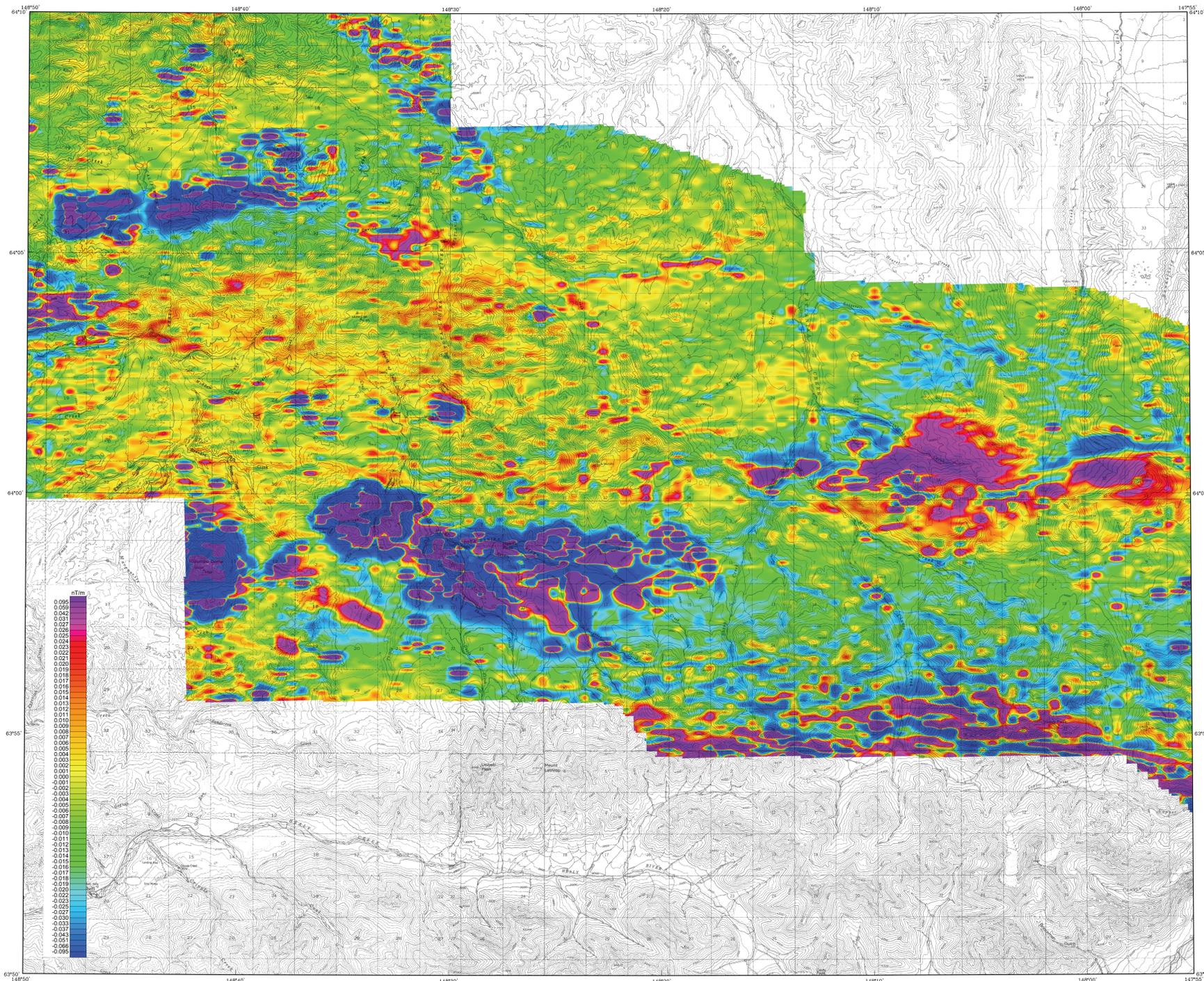
**MAGNETIC CONTOUR INTERVAL**

.....	100 nT
.....	20 nT
.....	4 nT
.....	2 nT

**SURVEY HISTORY**

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Base from U.S. Geological Survey Partials A-2, 1972; A-3, 1972; A-4, 1972; Map 1-C, 1963; 1-C, 1966; 1-C, 1970; Geologic Map, Alaska



**DESCRIPTIVE NOTES**  
The geophysical data were acquired with a DIGEMV Electromagnetic (EM) system and a Fugro D1344 cesium magnetometer with a Scintrex CS3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. In addition the survey recorded data from a raster altimeter, GPS navigation system, 30/60 Hz monitors and video camera. Flights were performed with an AS350B-3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (0°) 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.  
A Novatel OEM4-C2L 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 5m. Flight path positions were projected onto the Clarke 1846 (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 10m with respect to the UTM grid.



## FIRST VERTICAL DERIVATIVE OF THE MAGNETIC FIELD OF PARTS OF THE BONNIFIELD MINING DISTRICT, INTERIOR ALASKA

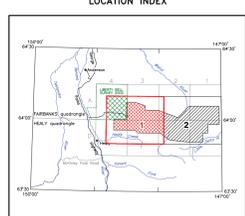
PARTS OF FAIRBANKS and HEALY QUADRANGLES  
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2007

**COLOR BAR HISTOGRAM**  
Approximately 98% of the first vertical derivative of the magnetic field for the entire Bonnifield Mining District dataset lie within the range displayed on the color bar. Data values actually range from -9.532 nT/m (dark blue) to about 19.291 nT/m (magenta). Actual values can be seen in digital publication GPR 2007-1.

### FIRST VERTICAL DERIVATIVE OF THE MAGNETIC FIELD

The magnetic total field data were processed using digitally recorded data from a Fugro D1344 cesium magnetometer with a Scintrex CS3 cesium sensor. Data were collected at 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 November 2004) 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. The first vertical derivative grid was calculated from the processed total magnetic field grid using a FFT base frequency domain filtering algorithm. The resulting first vertical derivative grid provides better definition and resolution of near-surface magnetic units and helps to identify weak magnetic features that may not be evident on the total field data.  
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. 589-592.

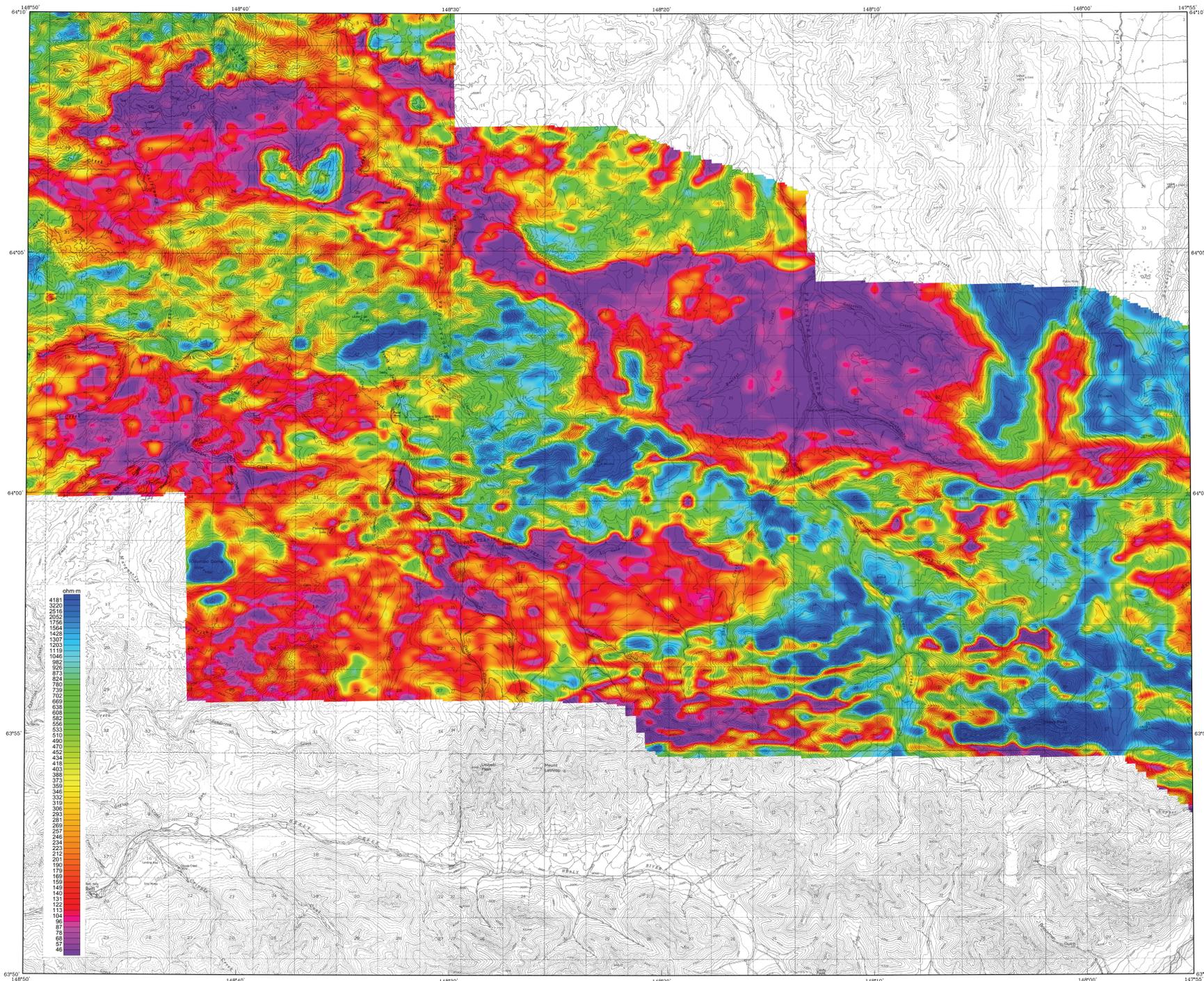
### LOCATION INDEX



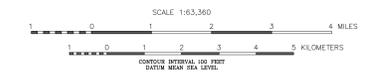
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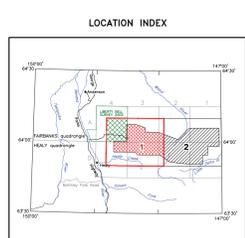


Base from U.S. Geological Survey Partials A-2, 1972; A-3, 1972; A-4, 1972; Heavy D-2, 1963; D-3, 1966; D-4, 1970, Earthquake, Alaska



## 56,000 Hz COPLANAR APPARENT RESISTIVITY OF PARTS OF THE BONNIFIELD MINING DISTRICT, INTERIOR ALASKA

PARTS OF FAIRBANKS AND HEALY QUADRANGLES  
by  
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.  
2007



**DESCRIPTIVE NOTES**

The geophysical data were acquired with a DIGHEM<sup>®</sup> Electromagnetic (EM) system and a Fugro D1344 cesium magnetometer with a Scintrex CS3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. In addition the survey recorded data from a rotor altimeter, GPS navigation system, 30/60 Hz monitors and video camera. Flights were performed with an AS350B-3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (0°) 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.

A Novatel OEM4-C2L 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 5m. Flight path positions were projected onto the Clarke 1866 (UTM zone 6) spheroid, 1927 North American datum using a central meridian (CM) of 147° 3' north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10m with respect to the UTM grid.

**RESISTIVITY**

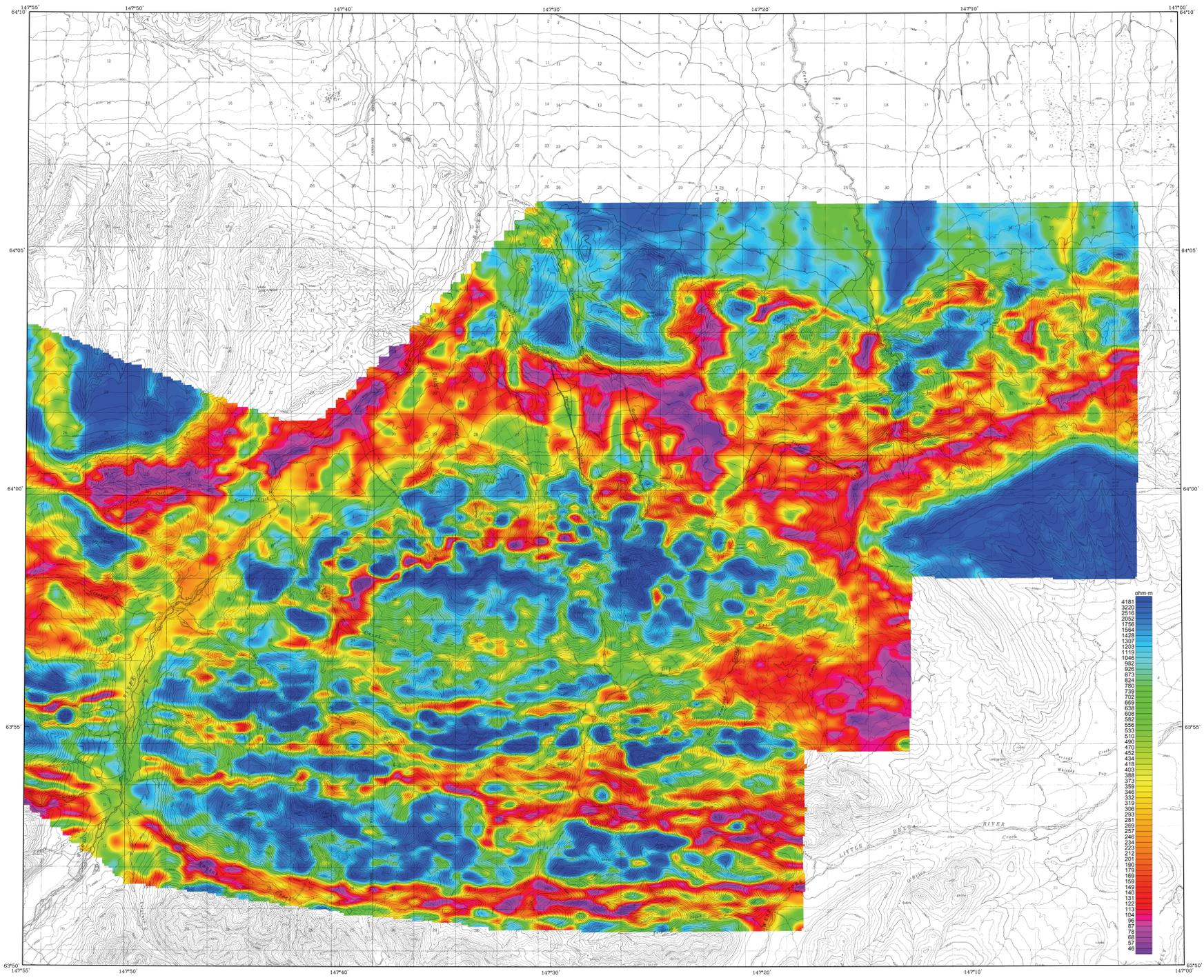
The DIGHEM<sup>®</sup> EM system measured inphase and quadrature components at five frequencies. Two vertical coplanar coil-pairs operated at 100 and 5500 Hz while three horizontal coplanar coil-pairs operated at 900, 7200 and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 56,000 Hz using the pseudo-layer half space model. The data were 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. 6, 589-592.

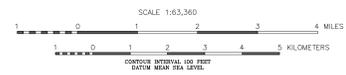
**SURVEY HISTORY**

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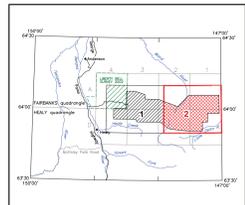
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Map from U.S. Geological Survey, Fairbanks, A-1, 1948, A-2, 1972; Healy, D.L., 1976, G.P. 100, Wallingford, Alaska.



LOCATION INDEX



## 56,000 Hz COPLANAR APPARENT RESISTIVITY OF PARTS OF THE BONNIFIELD MINING DISTRICT, INTERIOR ALASKA

PARTS OF FAIRBANKS AND HEALY QUADRANGLES

by  
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.  
2007

**DESCRIPTIVE NOTES**

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A Novatel OEM4-C2L 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 5m. Flight path positions were projected onto the Clarke 1866 (UTM zone 6) spheroid, 1927 North American datum using a central meridian (CM) of 147° 30' north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 50m with respect to the UTM grid.

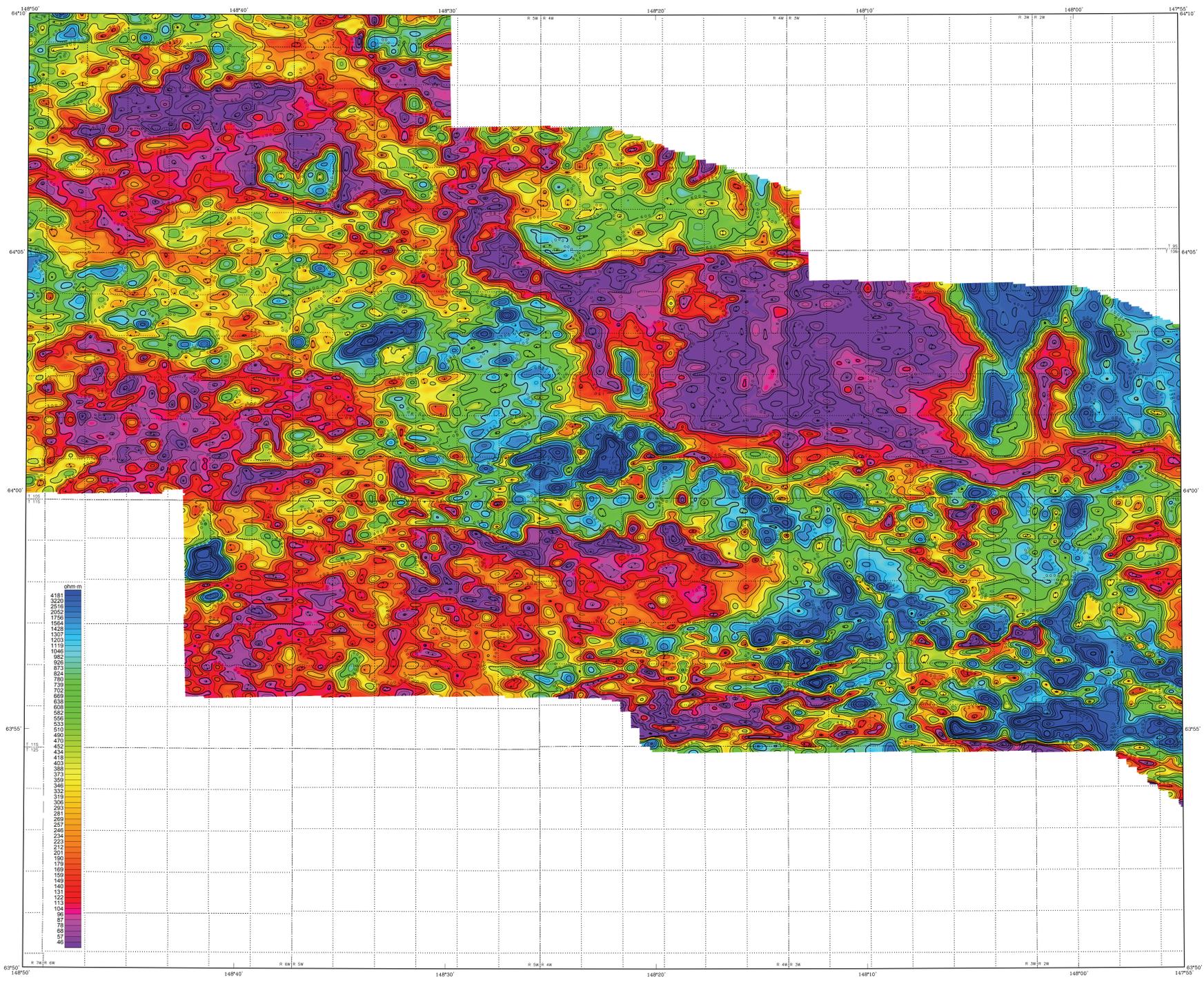
**RESISTIVITY**

The DIGHEM<sup>®</sup> EM system measured inphase and quadrature components at five frequencies. Two vertical coplanar coil-pairs operated at 100 and 2500 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. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 56,000 Hz using the pseudo-layer half space model. The data were 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. 6, 589-592.

**SURVEY HISTORY**

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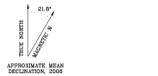


Section outlines from U.S. Geological Survey Fairbanks A-2, 1972; A-3, 1972; A-4, 1972; Healy D-2, 1965; D-3, 1965; D-4, 1970; Quadrangles, Alaska



## 56,000 Hz COPLANAR APPARENT RESISTIVITY OF PARTS OF THE BONNIFIELD MINING DISTRICT, INTERIOR ALASKA

PARTS OF FAIRBANKS and HEALY QUADRANGLES  
by  
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.  
2007



**DESCRIPTIVE NOTES**

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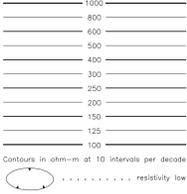
A Novatel OEM4-C2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential processing to a relative accuracy of better than 5m. Flight path positions were projected onto the Clarke 1846 (UTM zone 6) spheroid, 1927 North American 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 10m with respect to the UTM grid.

**RESISTIVITY**

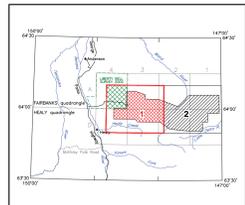
The DIGHEM<sup>®</sup> EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1000 and 2500 Hz while three horizontal coplanar coil-pairs operated at 900, 7200 and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 56,000 Hz using the pseudo-over half space model. The data were 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, pp.817-822.

**RESISTIVITY CONTOURS**



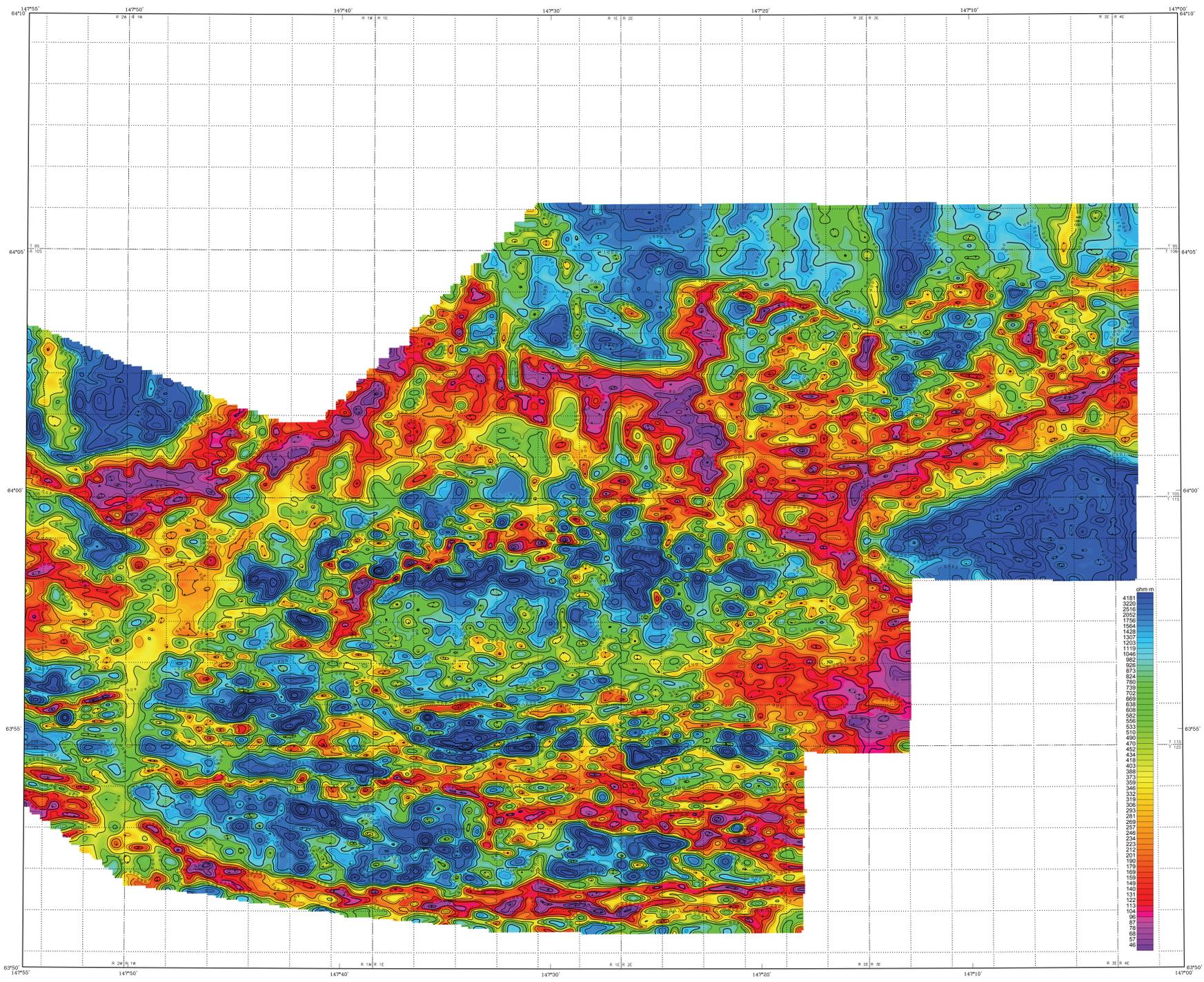
**LOCATION INDEX**



**SURVEY HISTORY**

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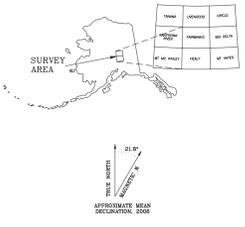
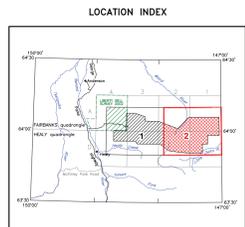


Section outline from U.S. Geological Survey Fairbanks A-1, 1949; A-2, 1972; Healy D-1, 1976; D-2, 1985, Shelikofne, Alaska



## 56,000 Hz COPLANAR APPARENT RESISTIVITY OF PARTS OF THE BONNIFIELD MINING DISTRICT, INTERIOR ALASKA

**PARTS OF FAIRBANKS and HEALY QUADRANGLES**  
by  
**Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.**  
2007



**DESCRIPTIVE NOTES**

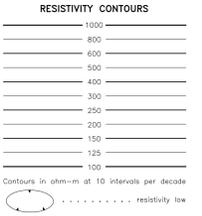
The geophysical data were acquired with a DIGHEM<sup>®</sup> Electromagnetic (EM) system and a Fugro D1344 cesium magnetometer with a Scintrex CS3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. In addition the survey recorded data from a rotor altimeter, GPS navigation system, 30/60 Hz monitors and video camera. Flights were performed with an AS350B-3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (0°) 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.

A Novatel OEM4-C2L 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 5m. Flight path positions were projected onto the Clarke 1858 (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 10m with respect to the UTM grid.

**RESISTIVITY**

The DIGHEM<sup>®</sup> EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1000 and 2500 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. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 56,000 Hz using the pseudo-over half space model. The data were interpolated onto a regular 80 m grid using a modified Akima (1970) technique.

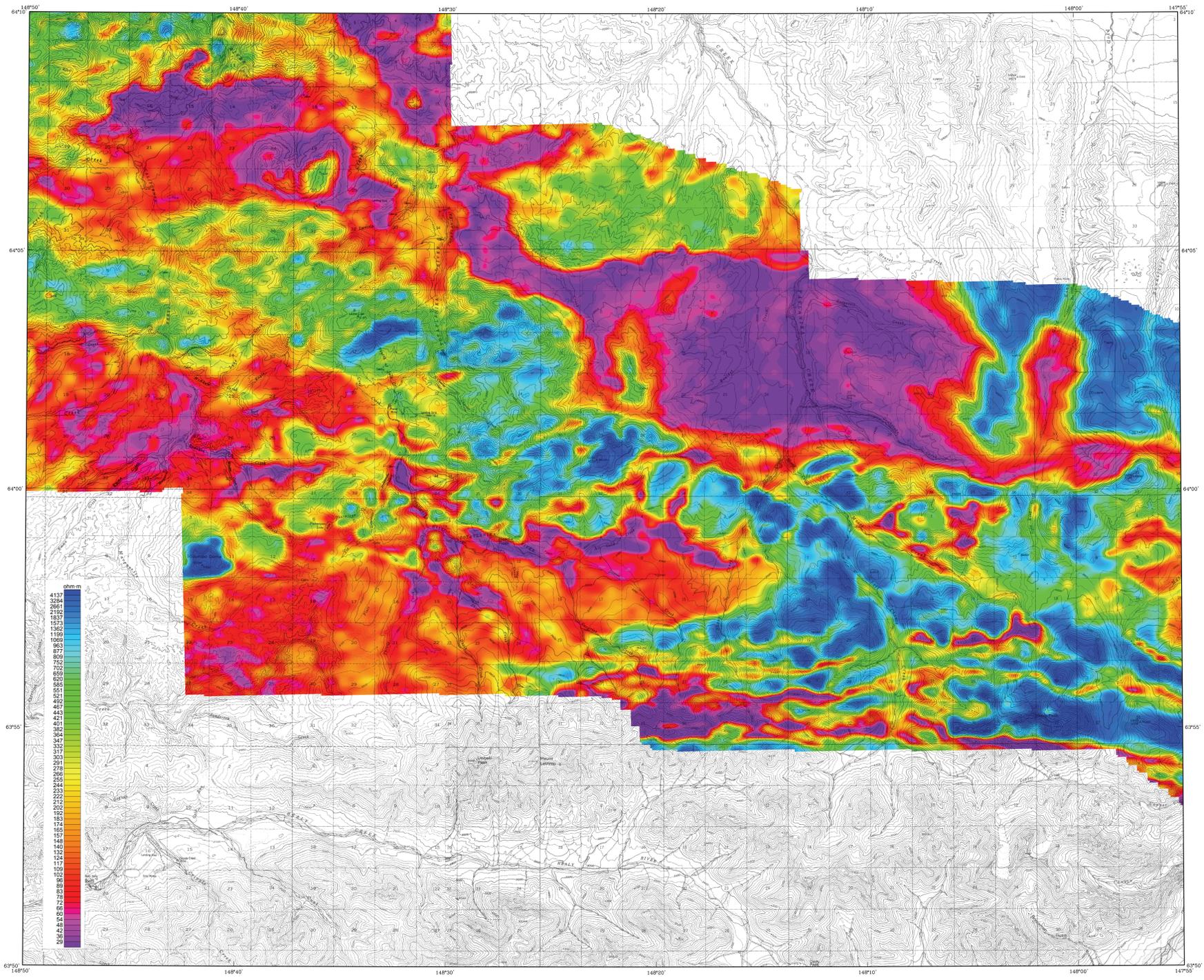
Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures, *Journal of the Association of Computing Machinery*, v. 17, no. 6, pp.817-822.



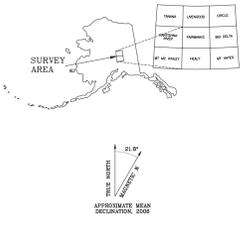
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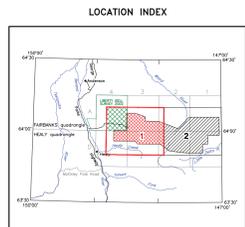


Base from U.S. Geological Survey Partials A-2, 1972; A-3, 1972; A-4, 1972; Heavy D-2, 1963; D-3, 1966; D-4, 1970; Quadrangles, Alaska



## 7200 Hz COPLANAR APPARENT RESISTIVITY OF PARTS OF THE BONNIFIELD MINING DISTRICT, INTERIOR ALASKA

**PARTS OF FAIRBANKS AND HEALY QUADRANGLES**  
by  
**Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.**  
2007



**DESCRIPTIVE NOTES**

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A Novatel OEM4-C2L 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 5m. Flight path positions were projected onto the Clarke 1866 (UTM zone 6) spheroid, 1927 North American datum using a central meridian (CM) of 147° 7' north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10m with respect to the UTM grid.

**RESISTIVITY**

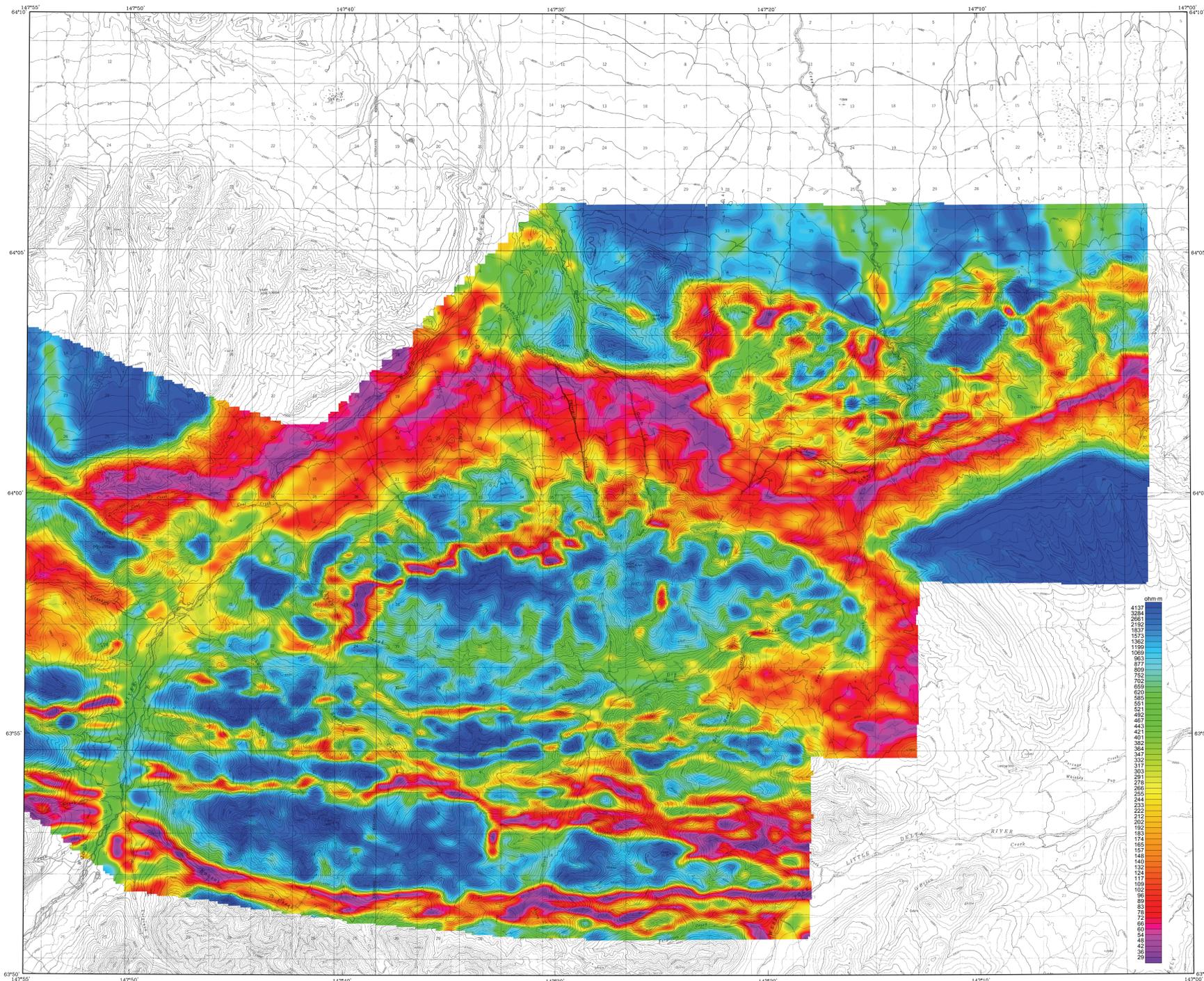
The DIGHEM<sup>®</sup> EM system measured inphase and quadrature components at five frequencies. Two vertical coplanar coil-pairs operated at 1000 and 2500 Hz while three horizontal coplanar coil-pairs operated at 900, 7200 and 54,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 7200 Hz using the pseudo-layer half space model. The data were 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. 6, 589-592.

**SURVEY HISTORY**

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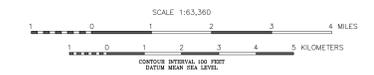
Map from U.S. Geological Survey, Pamphlet A-1, 1948, A-2, 1972.  
Map by D.L. 1995, D.L. 1995, Wallingford, Alaska.



**DESCRIPTIVE NOTES**

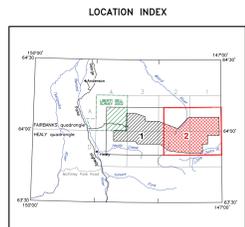
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A Novatel OEM4-C2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5m. Flight path positions were projected onto the Clarke 1866 (UTM zone 6) spheroid, 1927 North American datum using a central meridian (CM) of 147° 30' north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 50m with respect to the UTM grid.



**7200 Hz COPLANAR APPARENT RESISTIVITY  
OF PARTS OF THE BONNIFIELD MINING DISTRICT,  
INTERIOR ALASKA**

**PARTS OF FAIRBANKS AND HEALY QUADRANGLES**  
by  
**Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.**  
2007



**RESISTIVITY**

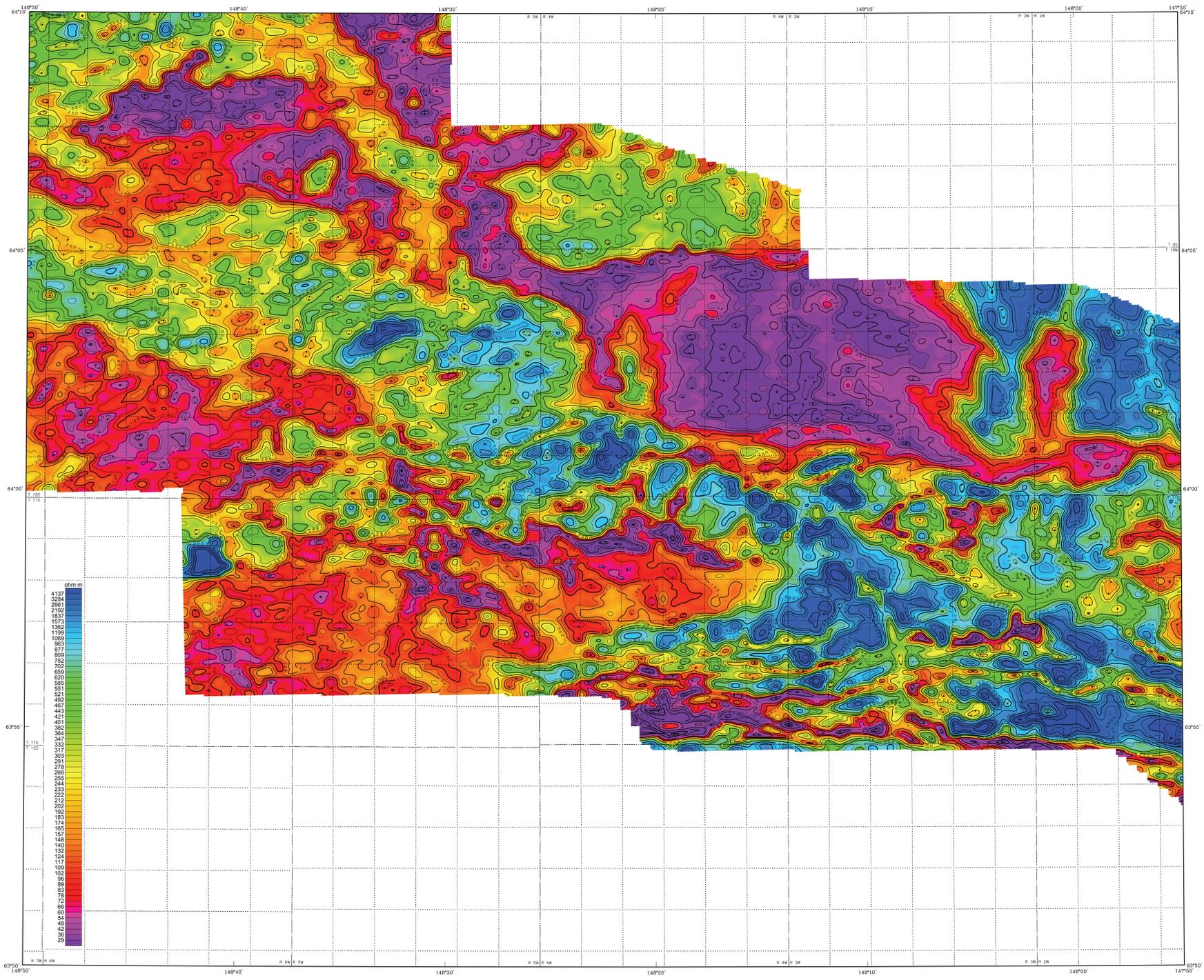
The DIGHEM<sup>®</sup> EM system measured inphase and quadrature components at five frequencies. Two vertical coplanar coil-pairs operated at 1000 and 2500 Hz while three horizontal coplanar coil-pairs operated at 900, 7200 and 26,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 7200 Hz using the pseudo-layer half space model. The data were 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. 6, p.881-892.

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Section outlines from U.S. Geological Survey Fairbanks A-2, 1972; A-3, 1972; A-4, 1972; Healy D-2, 1985; D-3, 1986; D-4, 1976; Quadrangles, Alaska



**DESCRIPTIVE NOTES**

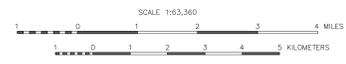
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**RESISTIVITY**

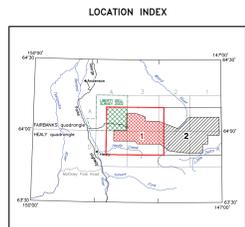
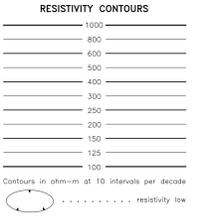
The DIGHEM<sup>®</sup> EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1000 and 2500 Hz while three horizontal coplanar coil-pairs operated at 900, 7200 and 58,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 7200 Hz using the pseudo-type half space model. The data were interpolated onto a regular 80 m grid using a modified Alamo (1970) technique.

Alamo, H., 1970. A new method of interpolation and smooth curve fitting based on local procedures. Journal of the Association of Computing Machinery, 17, 164, 168-172.



**7200 Hz COPLANAR APPARENT RESISTIVITY OF PARTS OF THE BONNIFIELD MINING DISTRICT, INTERIOR ALASKA**

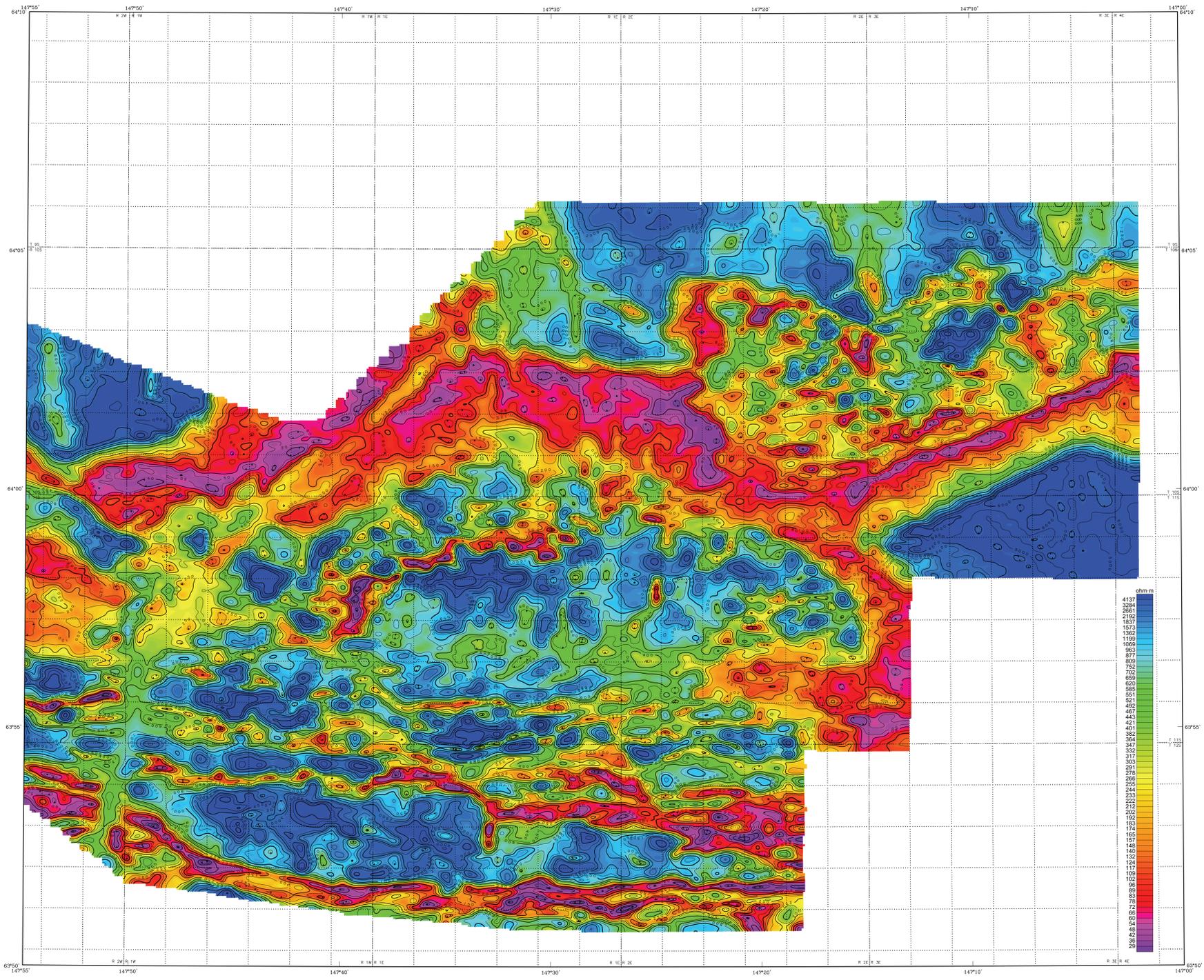
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by  
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2007



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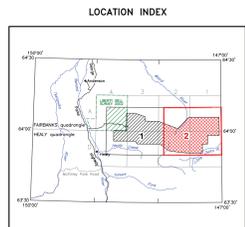


Section outline from U.S. Geological Survey Fairbanks A-1, 1949, A-2, 1972; Healy D-1, 1976, D-2, 1988, Shelburne, Alaska



## 7200 Hz COPLANAR APPARENT RESISTIVITY OF PARTS OF THE BONNIFIELD MINING DISTRICT, INTERIOR ALASKA

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by  
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2007



**DESCRIPTIVE NOTES**

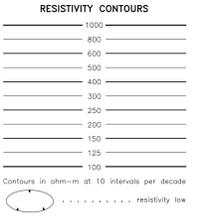
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A Novatel OEM4-C2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5m. Flight path positions were projected onto the Clarke 1822 (UTM zone 6) spheroid, 1927 North American datum using a central meridian (CM) of 147° 30' north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10m with respect to the UTM grid.

**RESISTIVITY**

The DIGHEM<sup>®</sup> EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1000 and 2500 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. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 7200 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 80 m grid using a modified Akima (1970) technique.

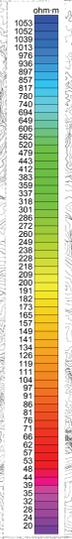
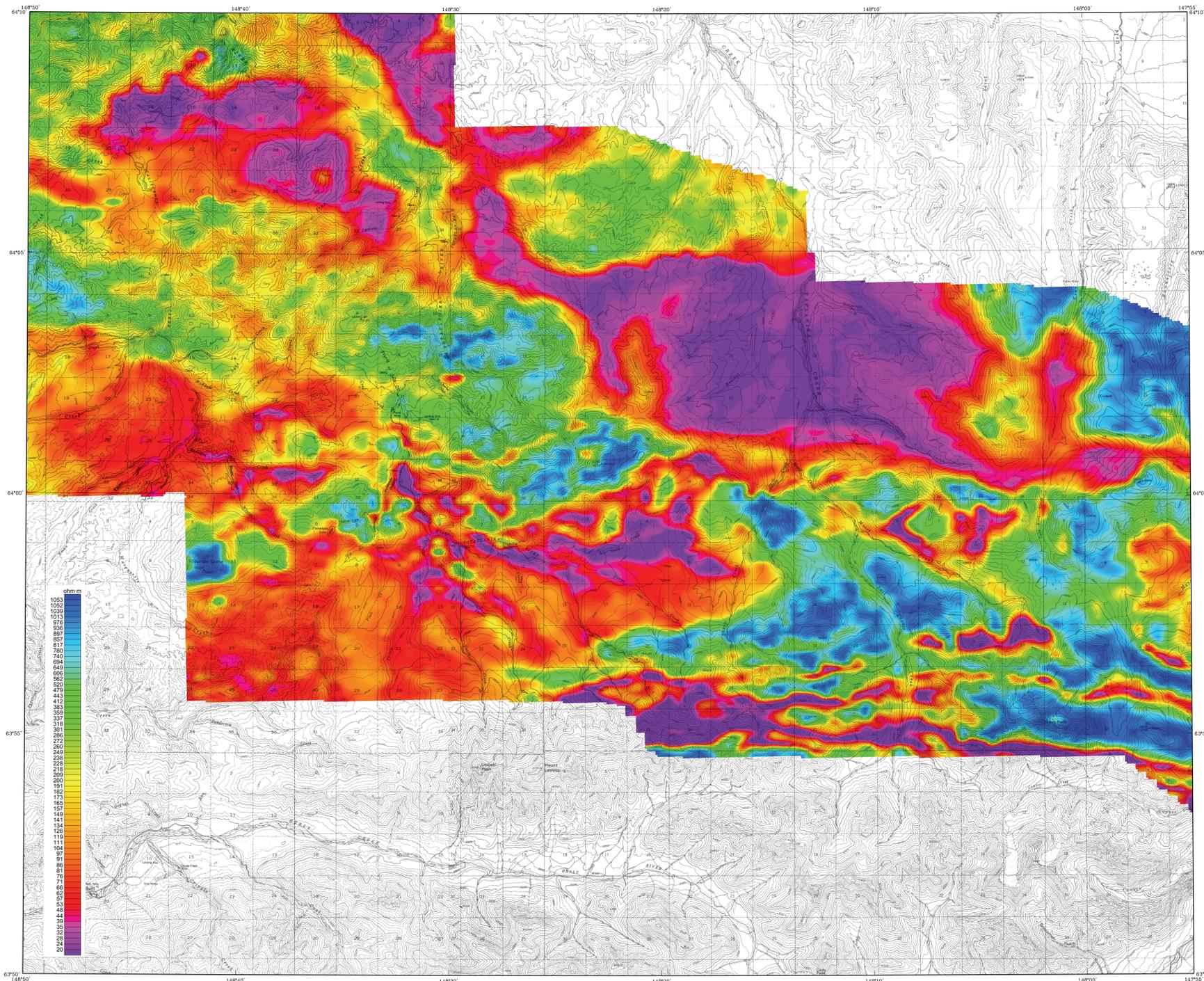
Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures, *Journal of the Association of Computing Machinery*, 17, no. 6, pp.817-822.



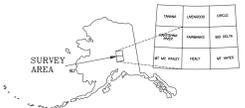
**SURVEY HISTORY**

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 area were acquired and processed by Fugro Airborne Surveys Corp. in 2006 and 2007.

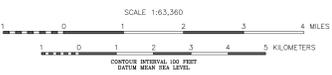
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Map from U.S. Geological Survey Pamphlet A-2, 1972; A-3, 1972; A-4, 1972; Map 9-C, 1965; D-1, 1966; D-4, 1970; Geographical Names

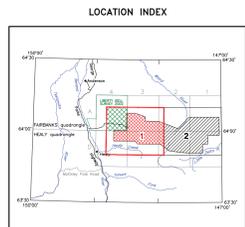


**DESCRIPTIVE NOTES**  
The geophysical data were acquired with a DIGHEM<sup>®</sup> Electromagnetic (EM) system and a Fugro D1344 cesium magnetometer with a Scintrex CS3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. In addition the survey recorded data from a rotor altimeter, GPS navigation system, 30/60 Hz monitors and video camera. Flights were performed with an AS350B-3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (0°) 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.  
A Novatel OEM4-C2L 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 5m. Flight path positions were projected onto the Clarke 1866 (UTM zone 6) spheroid, 1927 North American datum using a central meridian (CM) of 147°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10m with respect to the UTM grid.



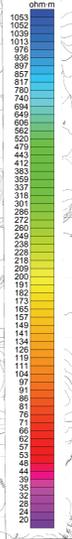
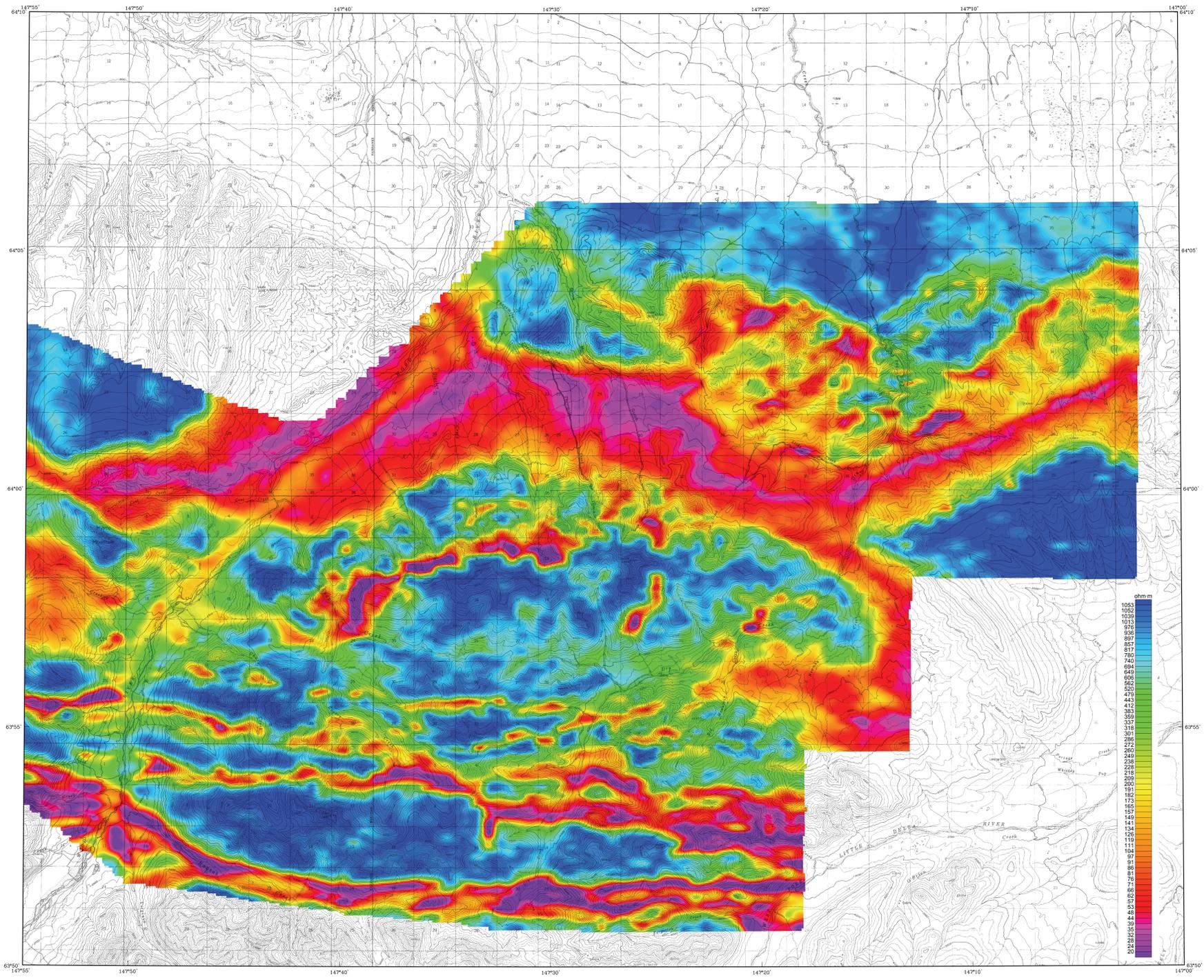
## 90 Hz COPLANAR APPARENT RESISTIVITY OF PARTS OF THE BONNIFIELD MINING DISTRICT, INTERIOR ALASKA

PARTS OF FAIRBANKS AND HEALY QUADRANGLES  
by  
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.  
2007



**RESISTIVITY**  
The DIGHEM<sup>®</sup> EM system measured inphase and quadrature components at five frequencies. Two vertical coplanar coil-pairs operated at 100 and 2500 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. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 900 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 80 m grid using a modified Akima (1972) technique.  
Akima, H., 1972. A new method of interpolation and smooth curve fitting based on local procedures. *Journal of the Association of Computing Machinery*, v. 21, 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 (DGGG), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys Corp. in 2006 and 2007.  
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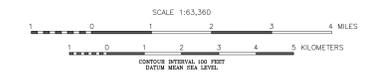
Map from U.S. Geological Survey, Pamphlets A-1, 1948; A-2, 1972; Map A-1, 1975; G-1, 1975; Washington, Alaska



**DESCRIPTIVE NOTES**

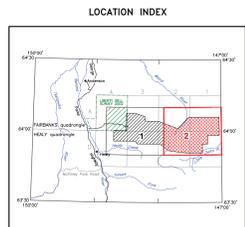
The geophysical data were acquired with a DIGHEM<sup>®</sup> Electromagnetic (EM) system and a Fugro D1344 cesium magnetometer with a Scintrex CS3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. In addition the survey recorded data from a rotor altimeter, GPS navigation system, 30/60 Hz monitors, and video camera. Flights were performed with an AS350B-3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (0°) 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.

A Novatel OEM4-C2L 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 5m. Flight path positions were projected onto the Clarke 1866 (UTM zone 6) spheroid, 1927 North American datum using a central meridian (CM) of 147°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 50m with respect to the UTM grid.



**900 HZ COPLANAR APPARENT RESISTIVITY  
OF PARTS OF THE BONNIFIELD MINING DISTRICT,  
INTERIOR ALASKA**

**PARTS OF FAIRBANKS AND HEALY QUADRANGLES**  
by  
**Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.**  
2007



**RESISTIVITY**

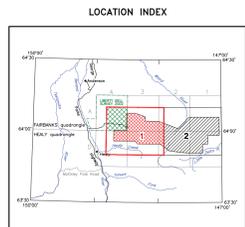
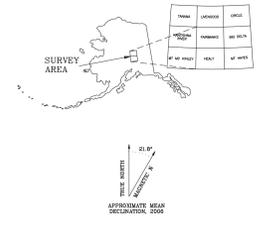
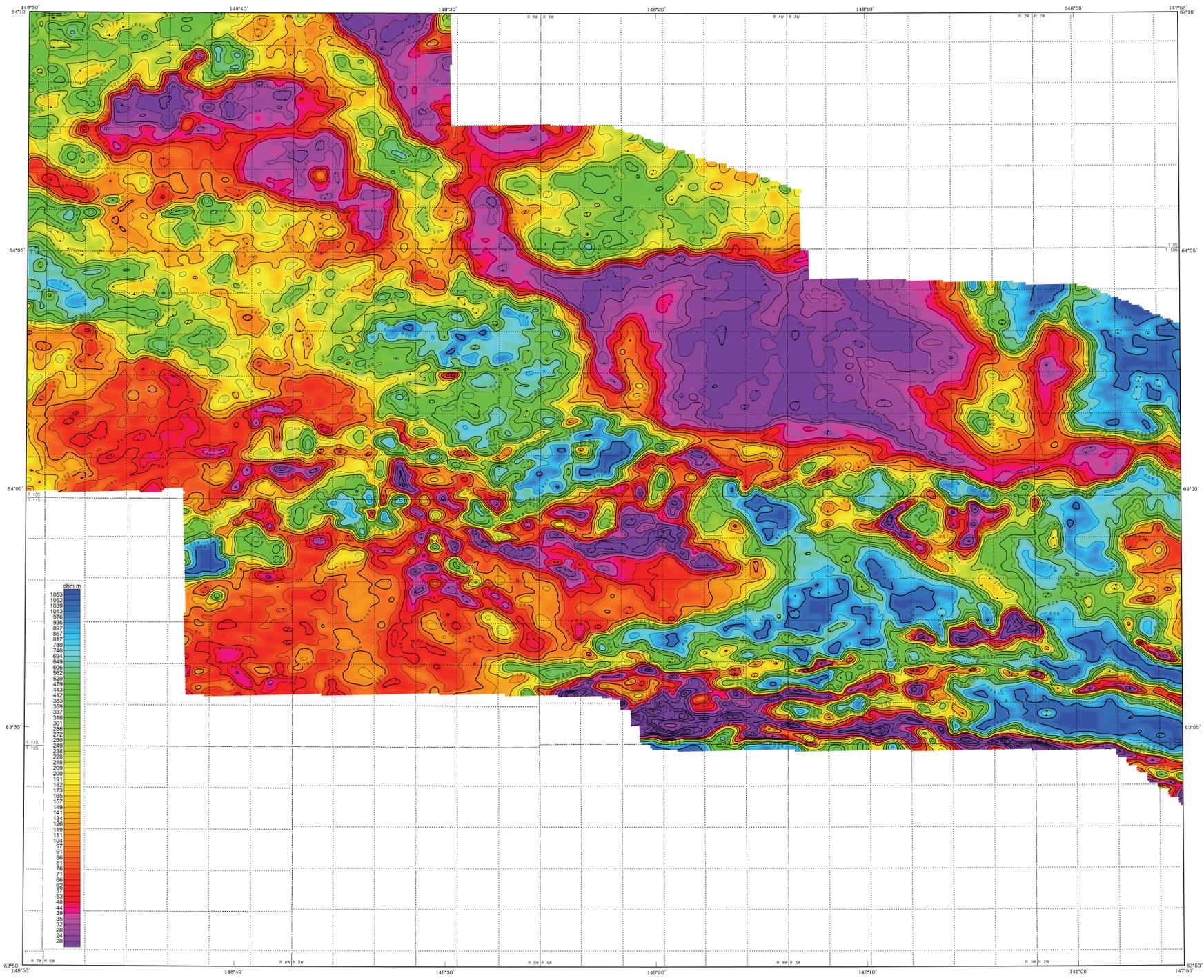
The DIGHEM<sup>®</sup> EM system measured inphase and quadrature components at five frequencies. Two vertical coplanar coil-pairs operated at 100 and 2500 Hz while three horizontal coplanar coil-pairs operated at 900, 7200 and 26,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 900 Hz using the pseudo-layer half space model. The data were 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. 6, 589-602.

**SURVEY HISTORY**

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## 900 HZ COPLANAR APPARENT RESISTIVITY OF PARTS OF THE BONNIFIELD MINING DISTRICT, INTERIOR ALASKA

PARTS OF FAIRBANKS and HEALY QUADRANGLES  
by  
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.  
2007

**DESCRIPTIVE NOTES**

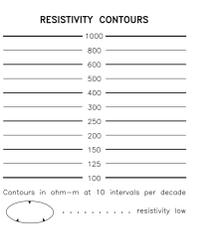
The geophysical data were acquired with a DIGHEM<sup>®</sup> Electromagnetic (EM) system and a Fugro D1344 cesium magnetometer with a Scintrex CS3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. In addition the survey recorded data from a rotor altimeter, GPS navigation system, 30/60 Hz monitors and video camera. Flights were performed with an AS350B-3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (0°) 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.

A Novatel OEM4-C2L 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 5m. Flight path positions were projected onto the Clarke 1846 (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 10m with respect to the UTM grid.

**RESISTIVITY**

The DIGHEM<sup>®</sup> EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1000 and 2500 Hz while three horizontal coplanar coil-pairs operated at 900, 7200 and 58,000 Hz. EM data were sampled at 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 900 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 80 m grid using a modified Akima (1970) technique.

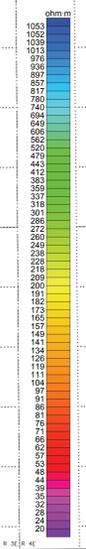
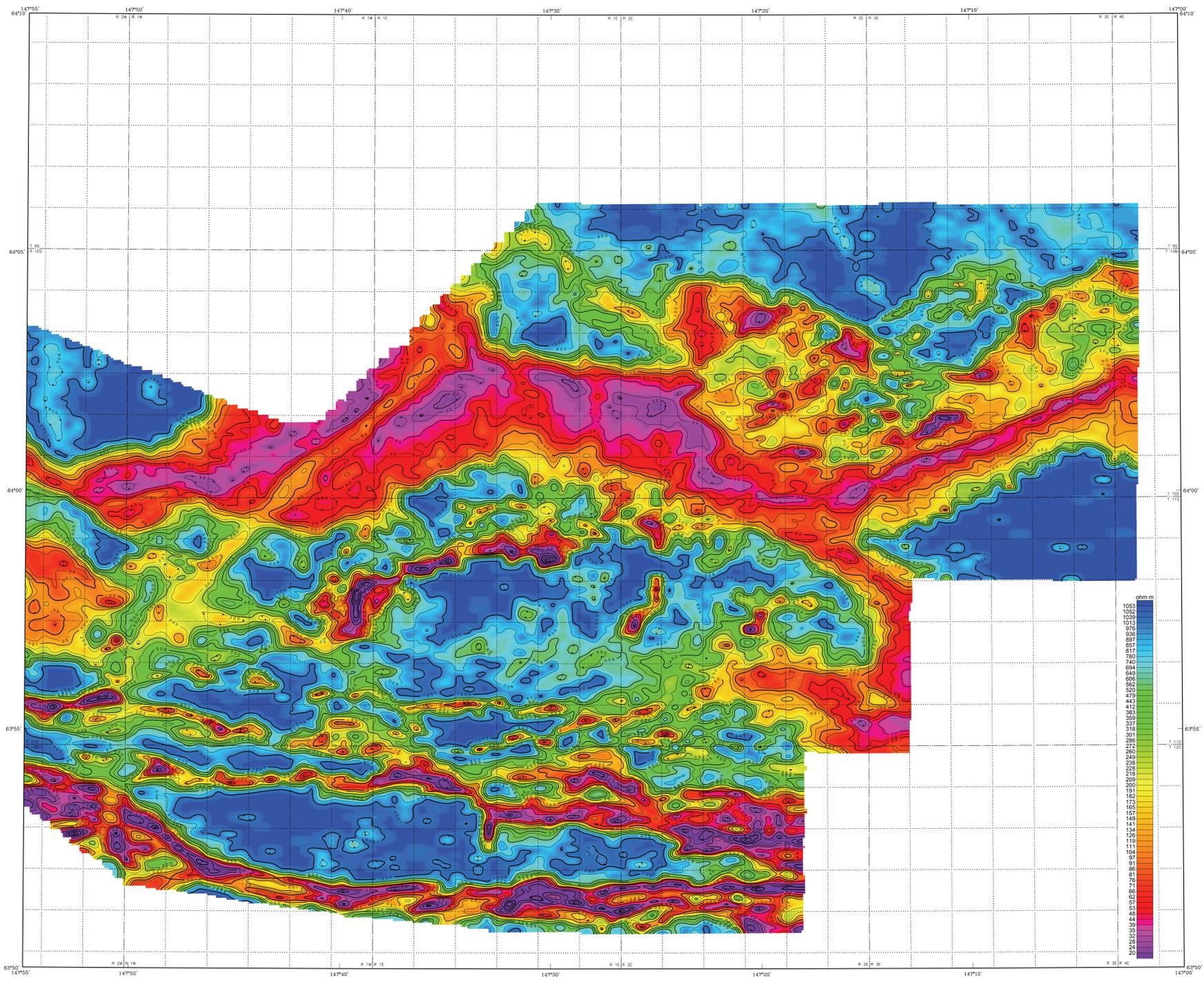
Akima, H., 1970. A new method of interpolation and smooth curve fitting based on local procedures. *Journal of the Association of Computing Machinery*, v. 17, no. 6, pp.817-822.



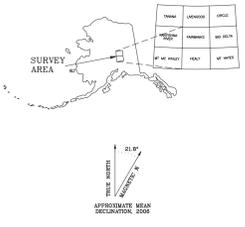
**SURVEY HISTORY**

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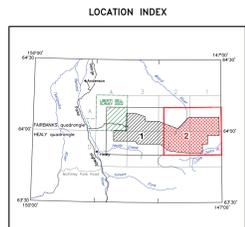


Section outline from U.S. Geological Survey Fairbanks A-1, 1949; A-2, 1972; Healy D-1, 1976; D-2, 1985, Fairbanks, Alaska



## 900 HZ COPLANAR APPARENT RESISTIVITY OF PARTS OF THE BONNIFIELD MINING DISTRICT, INTERIOR ALASKA

PARTS OF FAIRBANKS and HEALY QUADRANGLES  
by  
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.  
2007



**DESCRIPTIVE NOTES**

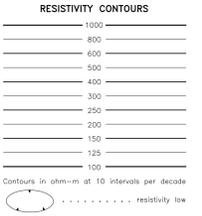
The geophysical data were acquired with a DIGHEM<sup>®</sup> Electromagnetic (EM) system and a Fugro D1344 cesium magnetometer with a Scintrex CS3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. In addition the survey recorded data from a rotor altimeter, GPS navigation system, 30/60 Hz monitors and video camera. Flights were performed with an AS350B-3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (0°) 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.

A Novatel OEM4-C2L 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 5m. Flight path positions were plotted onto the Clarke 1859 (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 50m with respect to the UTM grid.

**RESISTIVITY**

The DIGHEM<sup>®</sup> EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1000 and 2500 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. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 900 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 80 m grid using a modified Akima (1970) technique.

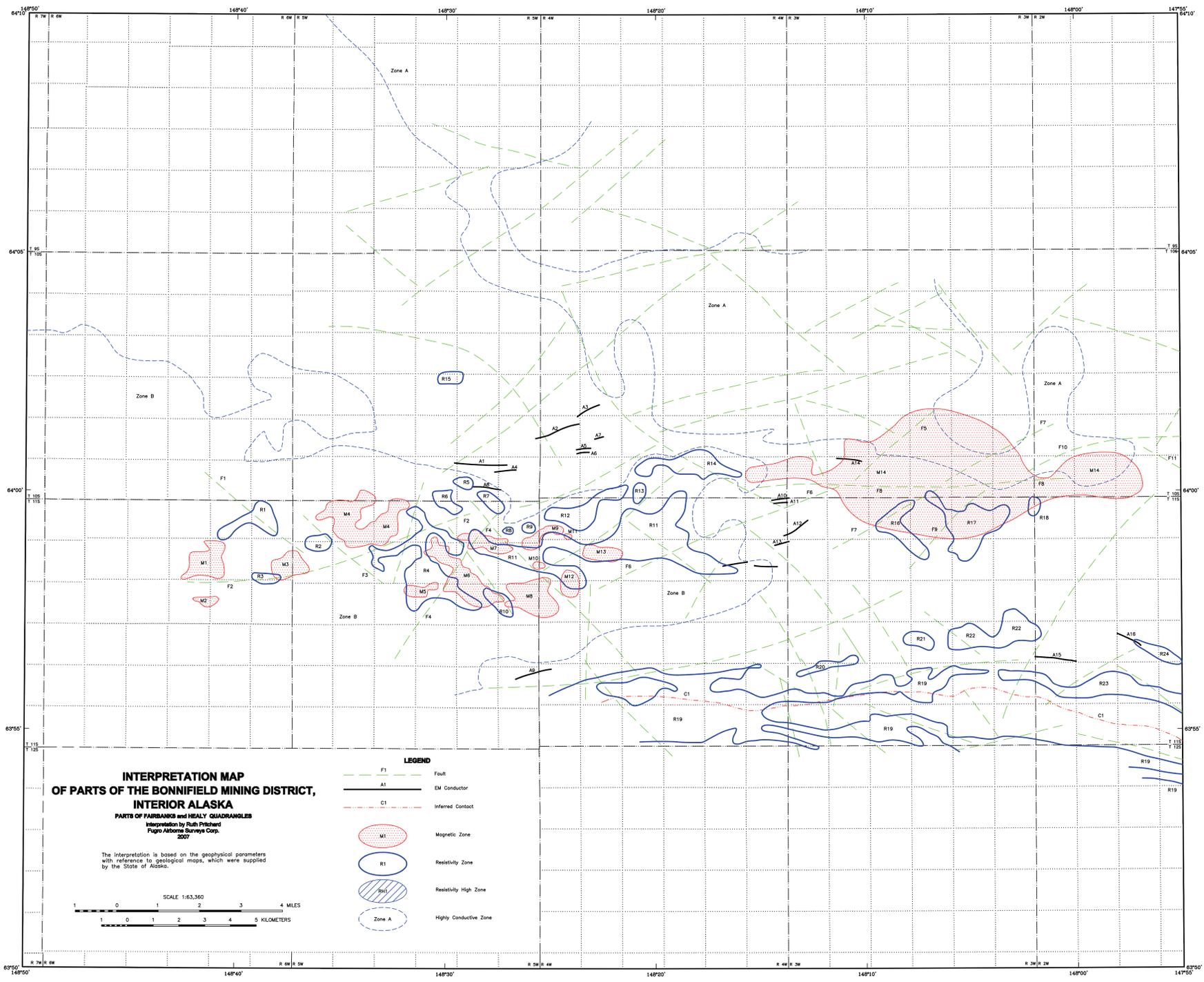
Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures, *Journal of the Association of Computing Machinery*, 17, 964, 974-977.



**SURVEY HISTORY**

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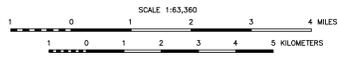
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**INTERPRETATION MAP  
OF PARTS OF THE BONNIFIELD MINING DISTRICT,  
INTERIOR ALASKA**

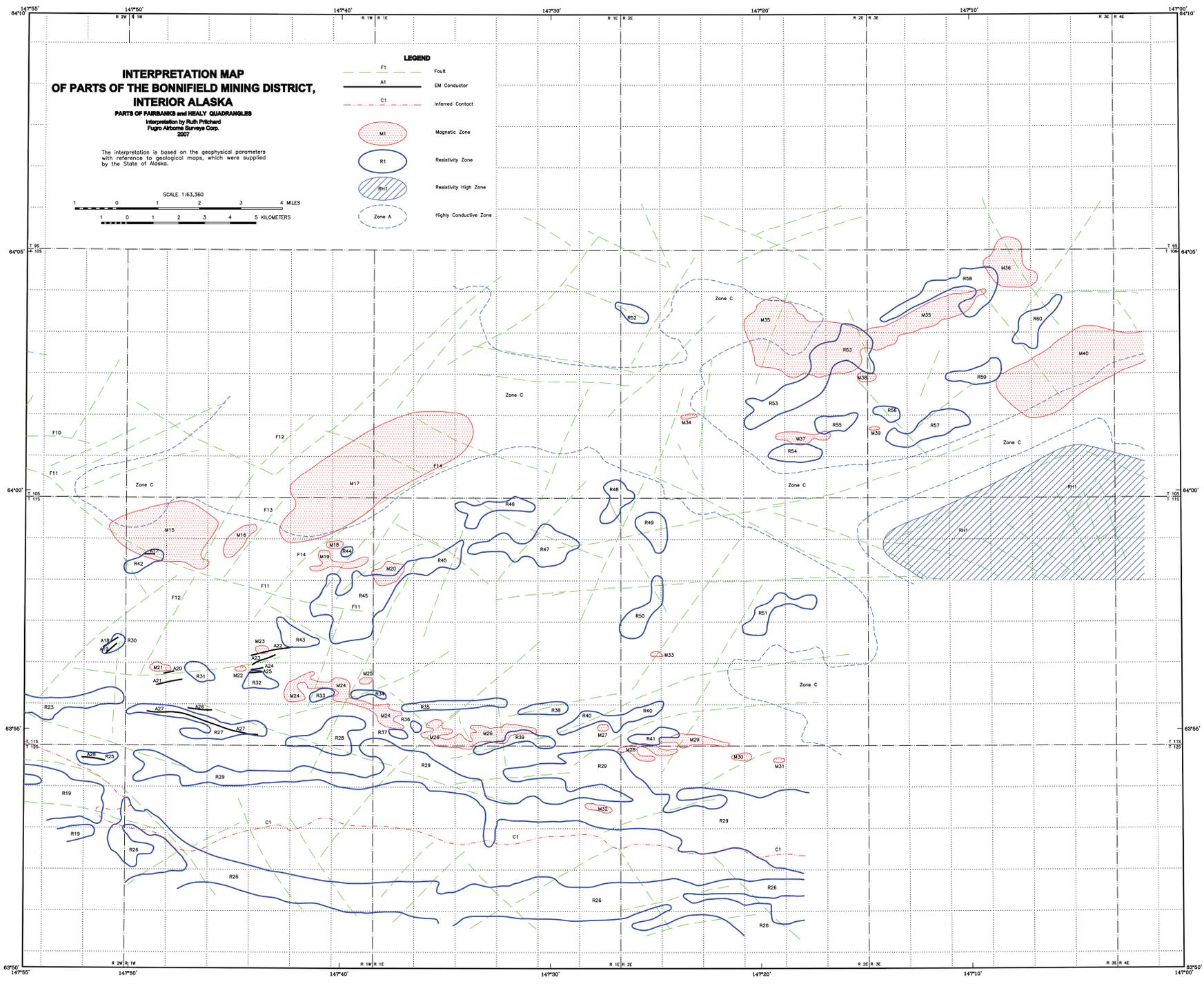
PARTS OF FAIRBANKS and HEALY QUADRANGLES  
Interpretation by Ruth Pritchard  
Fugro Alaska Surveys Corp.  
2007

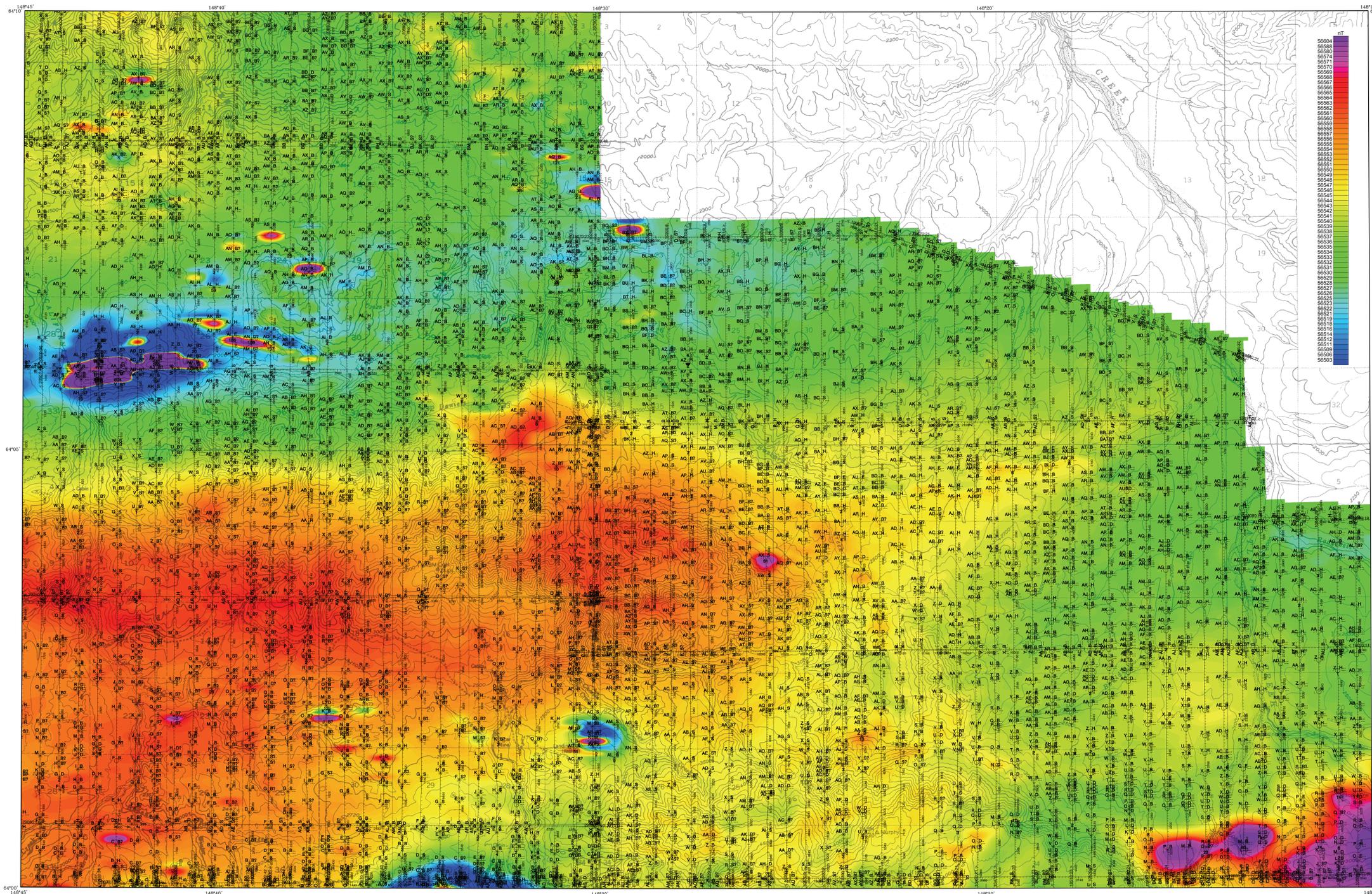
The interpretation is based on the geophysical parameters  
with reference to geological maps, which were supplied  
by the State of Alaska.



**LEGEND**

- F1 Fault
- A1 EM Conductor
- C1 Inferred Contact
- M1 Magnetic Zone
- R1 Resistivity Zone
- RH1 Resistivity High Zone
- Zone A Highly Conductive Zone





Base from U.S. Geological Survey Fairbanks A-3, 1972, A-4, 1972, Quadrangles, Alaska



**DESCRIPTIVE NOTES**

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A Novatel OEM4-C2L 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 5m. Flight path positions were projected onto the Clarke 1866 (UTM zone 6) spheroid, 1927 North American datum using a central meridian (CM) of 147° 7' north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10m with respect to the UTM grid.



**TOTAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES OF PARTS OF THE BONNIFIELD MINING DISTRICT, INTERIOR ALASKA**

PARTS OF FAIRBANKS A-3 and A-4 QUADRANGLES  
by  
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.  
2007

- ELECTROMAGNETIC ANOMALIES**
- Anomaly
  - Arcs indicate the conductor top & thickness >10m
  - Magnetic correlation in nT
  - Dip direction
- ELECTROMAGNETICS**
- Conductance
  - >100 siemens
  - 50-100 siemens
  - 20-50 siemens
  - 10-20 siemens
  - 5-10 siemens
  - 1-5 siemens
  - <1 siemens
  - Questionable anomaly
  - △ EM magnetic response
- INTERPRETIVE SYMBOL**
- B Bedrock conductor
  - N Narrow bedrock conductor ("thin sheet")
  - D Dip
  - S Conductive cover ("horizontal thin sheet")
  - H Broad conductive rock unit, steep conductive weathering, rock conductive cover
  - E Edge of areas conductor ("thin space")
  - ... Edge of half space?
  - Culture, e.g., power line, metal building or fence
- DEPTH**
- 15 m
  - 20 m
  - 30 m
  - 40 m
  - 50 m
  - 60 m



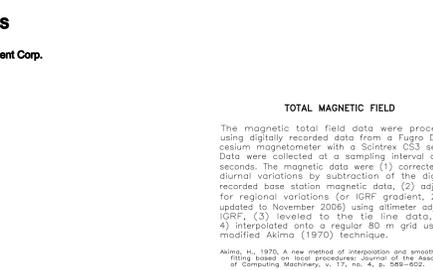
**TOTAL MAGNETIC FIELD**

The magnetic total field data were processed using digitally recorded data from a Fugro D1344 cesium magnetometer with a Scintrex CS3 sensor. Data were collected at 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 November 2006) using altimeter adjusted IGRF, (3) leveled to the tie line data, and (4) interpolated onto a regular 80 m grid using a modified Airina (1970) technique.

To determine the location of EM anomalies or their boundaries, the DIGHEMV EM system measured in-phase and quadrature components at five frequencies: two vertical coplanar-coil pairs operated at 1000 and 5500 Hz while three horizontal coplanar-coil pairs operated at 300, 7200, and 58200 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 aeromagnetic map by the interpretive symbols attached to each EM anomaly. Determination of the type of conductor is based on EM anomaly shapes, the in-phase and quadrature 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.



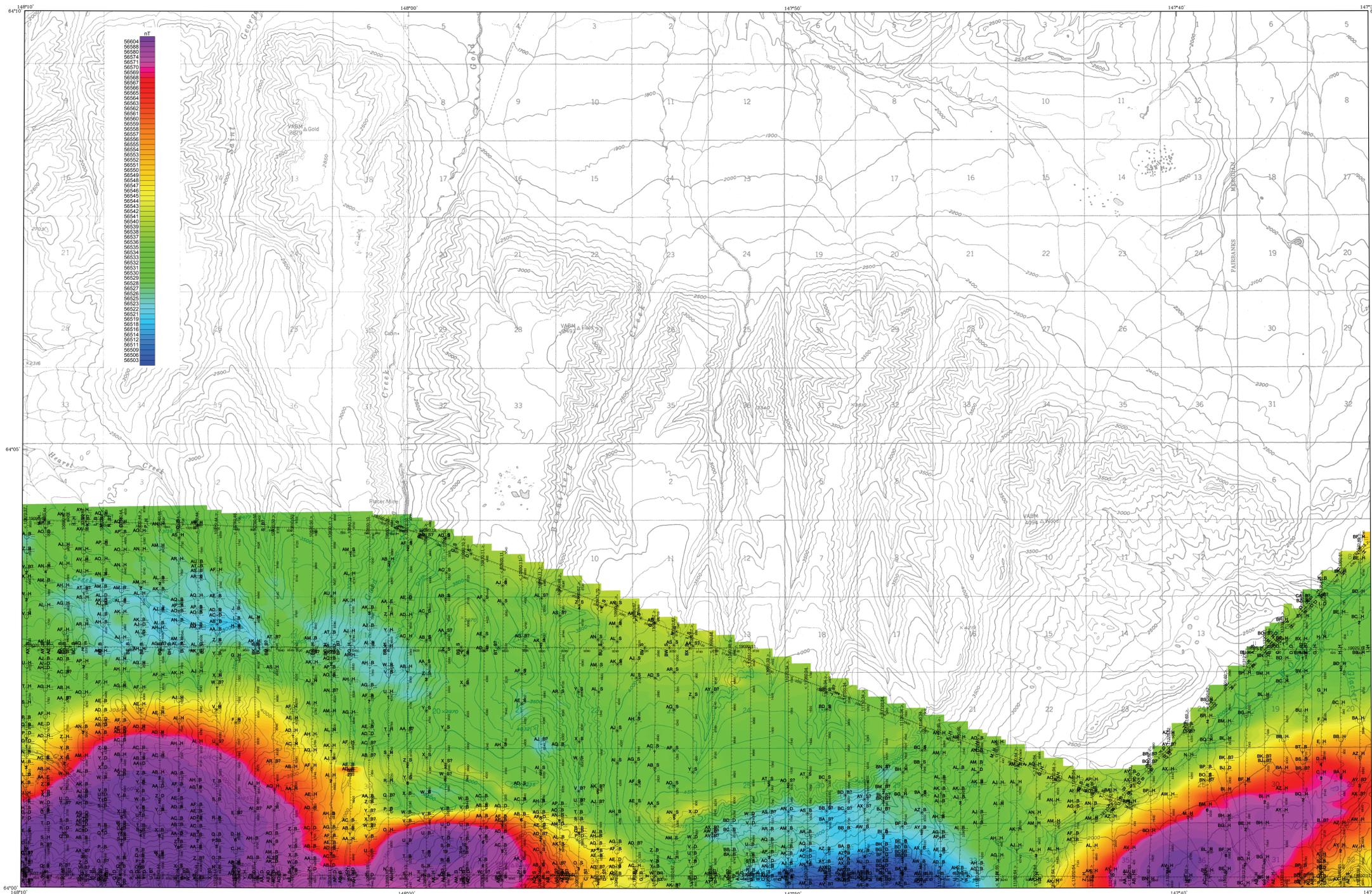
**LOCATION INDEX FOR 1:31,680**



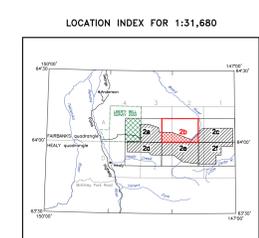
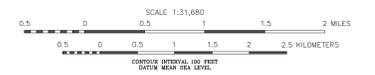
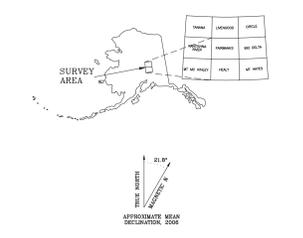
**SURVEY HISTORY**

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Base from U.S. Geological Survey Fairbanks A-2, 1972, A-3, 1972, Quadrangles, Alaska



# TOTAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES OF PARTS OF THE BONNIFIELD MINING DISTRICT, INTERIOR ALASKA

PARTS OF FAIRBANKS A-3 AND A-4 QUADRANGLES  
by  
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.  
2007

**DESCRIPTIVE NOTES**  
The geophysical data were acquired with a DIGHEMV Electromagnetic (EM) system and a Fugro D1344 cesium magnetometer with a Scintrex CS3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. In addition to the survey recorded data from a rotor altimeter, GPS navigation system, 30/60 Hz monitors and video camera. Flights were performed with an AS350B-3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (0°) 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.  
A Novatel OEM4-C2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a real-time accuracy of better than 5m. Flight path positions were projected onto the Clarke 1866 (UTM zone 6) spheroid, 1927 North American datum using a central meridian (CM) of 147° 30' north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10m with respect to the UTM grid.

### ELECTROMAGNETIC ANOMALIES

- Anomaly
- Arcs indicate the conductor top a thickness >10m
- Magnetic correlation in mT
- Dip direction
- Anomaly identifier
- Interpretive symbol
- Depth is greater than
  - 15 m
  - 30 m
  - 45 m
  - 60 m

- Conductance
- >100 siemens
- 50-100 siemens
- 20-50 siemens
- 10-20 siemens
- 5-10 siemens
- 1-5 siemens
- < 1 siemens
- Questionable anomaly
- △ EM magnetic response

### ELECTROMAGNETICS

To determine the location of EM anomalies or their boundaries, the DIGHEMV EM system measured resistive and quadrature components at five frequencies. Two vertical coplanar-coil pairs operated at 1000 and 5500 Hz while three horizontal coplanar-coil pairs operated at 300, 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 aeromagnetic map by the interpretive symbol attached to each EM anomaly. Determination of the type of conductor is based on EM anomaly shapes of the conductor and coplanar-coil responses, together with conductor and magnetic patterns and topography. The power line monitor and the light track video were examined to locate cultural sources.

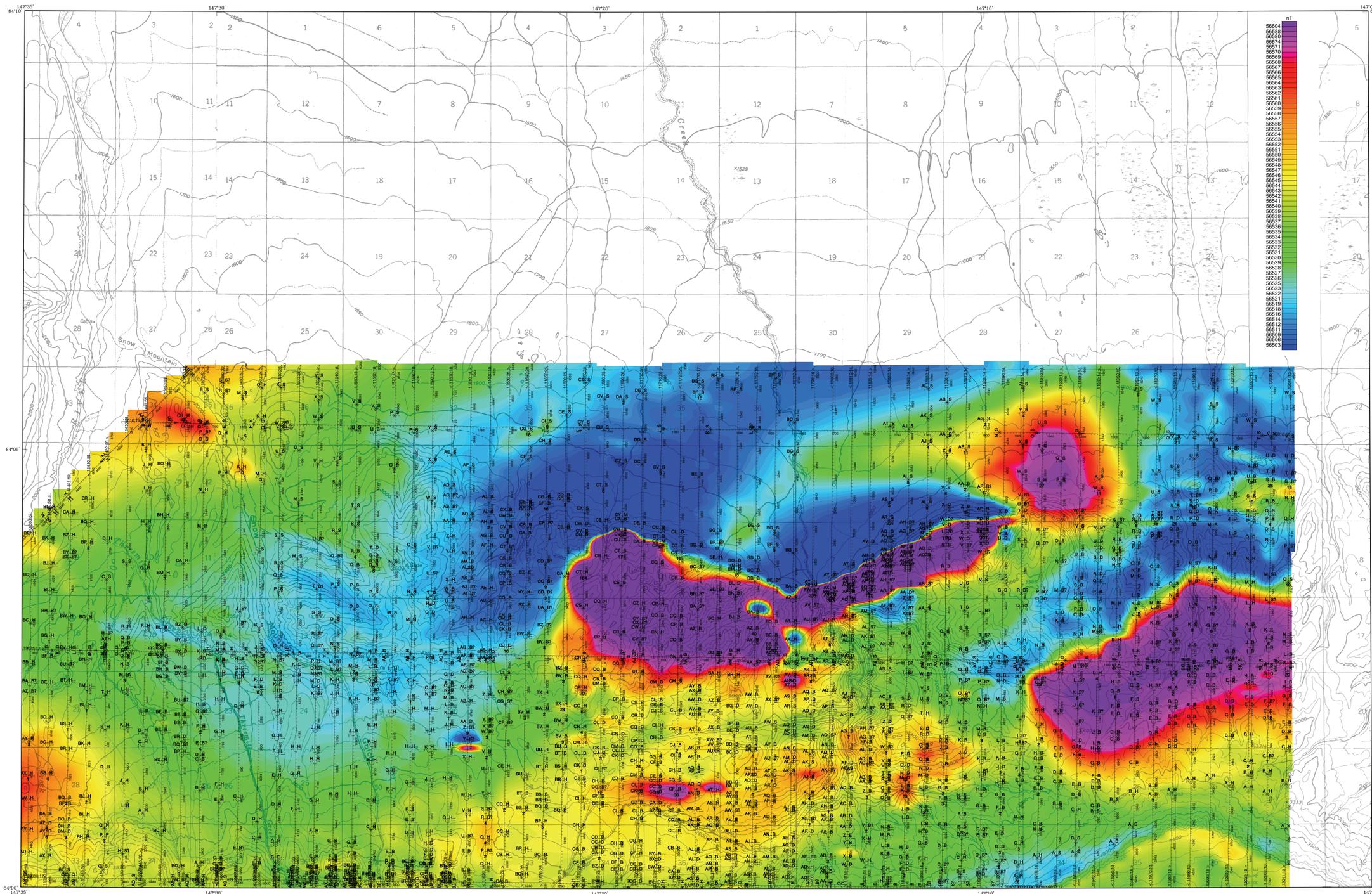
### TOTAL MAGNETIC FIELD

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### SURVEY HISTORY

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Airina, 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. 589-620.



Base from U.S. Geological Survey Fairbanks A-1, 1948; A-2, 1972; Quadrangles, Alaska

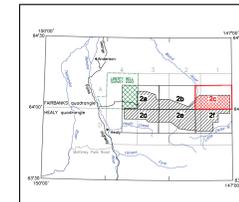


# TOTAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES OF PARTS OF THE BONNIFIELD MINING DISTRICT, INTERIOR ALASKA

PARTS OF FAIRBANKS A-1 AND A-2 QUADRANGLES

by  
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.  
2007

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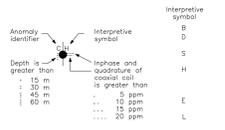
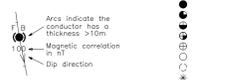


### DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEMV Electromagnetic (EM) system and a Fugro D1344 cesium magnetometer with a Sinterex CS3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. In addition to the survey recorded data from a rotor altimeter, GPS navigation system, 30/60 Hz monitors and video camera. Flights were performed with an AS350B-3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (0°) 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.

A Novatel OEM4-C2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a reference accuracy of better than 5m. Flight path positions were projected onto the Clarke 1866 (UTM zone 6) spheroid, 1927 North American datum using a central meridian (CM) of 147° 9 north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10m with respect to the UTM grid.

### ELECTROMAGNETIC ANOMALIES



- Anomaly
- Questionable anomaly
- △ EM magnetic response

- Bedrock conductor
- Name bedrock conductor ("thin sheet")
- Broad conductive rock unit, steep conductive weathering, rock conductive cover
- "Thin spaces"
- Edge of broad conductor
- "Half spaces"
- Culture, e.g. power line, metal building or fence

### ELECTROMAGNETICS

To determine the location of EM anomalies or their boundaries, the DIGHEMV EM system measured resistive and quadrature components at five frequencies. Two vertical coplanar-coil pairs operated at 1000 and 5500 Hz while three horizontal coplanar-coil pairs operated at 300, 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 aeromagnetic map by the interpretive symbol attached to each EM anomaly. Determination of the type of conductor is based on EM anomaly shapes of the coplanar and coplanar-coil responses, together with conductor and magnetic patterns and topography. The power line monitor and the light track video were examined to locate cultural sources.

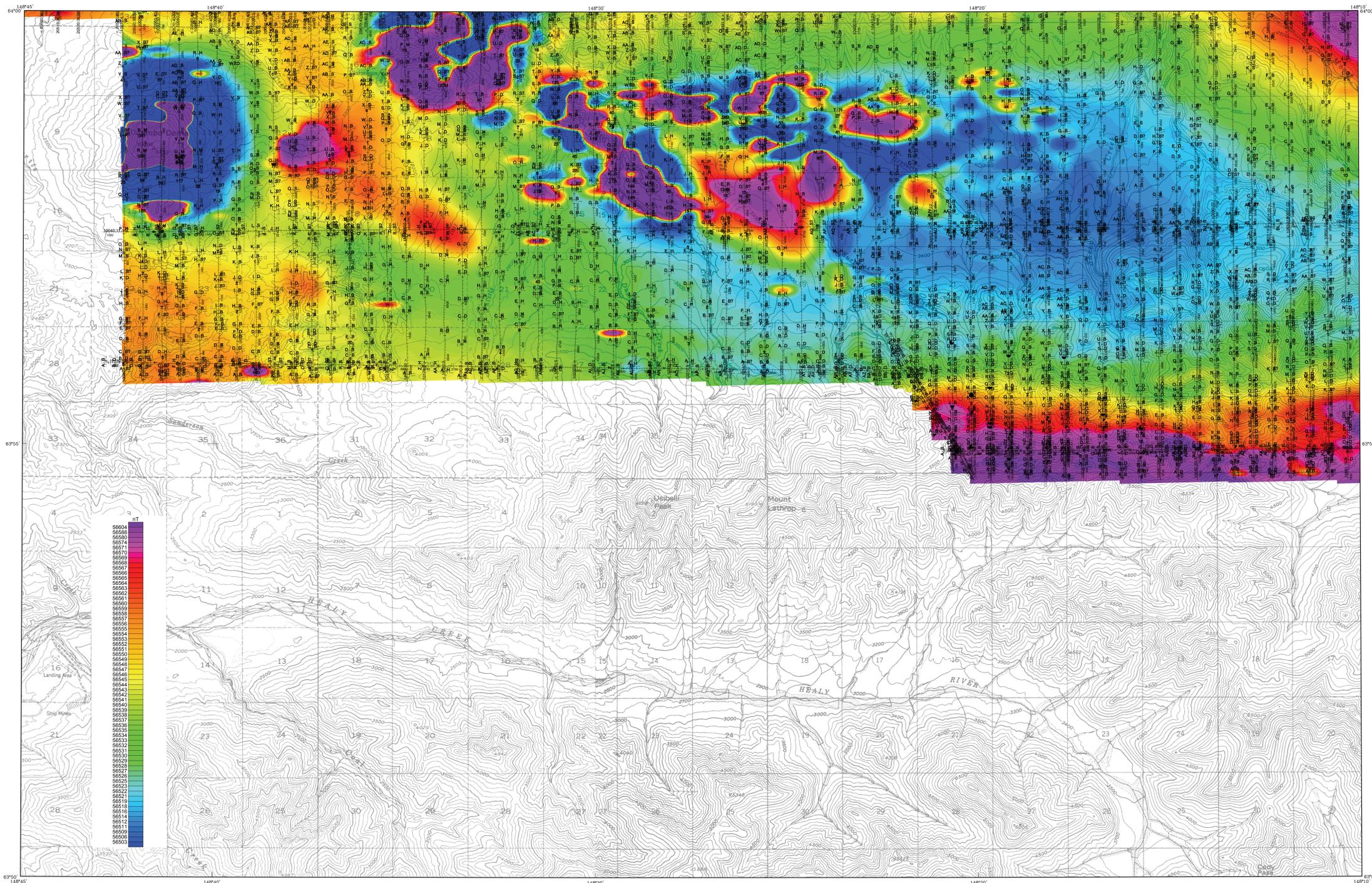
### TOTAL MAGNETIC FIELD

The magnetic total field data were processed using digitally recorded data from a Fugro D1344 cesium magnetometer with a Sinterex CS3 sensor. Data were collected at 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 November 2006) using allimeter adjusted IGRF, (3) leveled to the tie line data, and (4) interpolated onto a regular 80 m grid using a modified Anima (1970) technique.

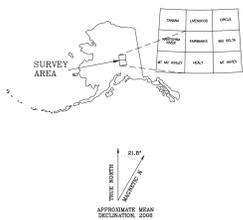
Anima, H., 1970. A new method of interpolation and smooth curve fitting based on local procedures. *Journal of the Association of Computing Machinery*, v. 17, no. 4, p. 589-600.

### SURVEY HISTORY

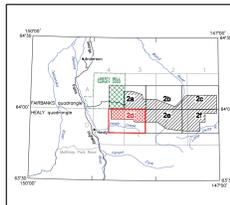
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Base from U.S. Geological Survey Healy D-3, 1961, D-4, 1976, Quadrangles, Alaska



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# TOTAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES OF PARTS OF THE BONNIFIELD MINING DISTRICT, INTERIOR ALASKA

PARTS OF HEALY D-3 and D-4 QUADRANGLES

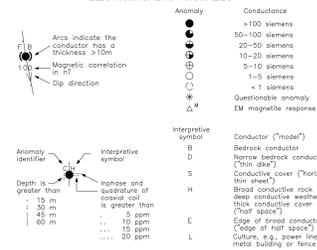
by  
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp., 2007

**DESCRIPTIVE NOTES**

The geophysical data were acquired with a DIGHEMV Electromagnetic (EM) system and a Fugro D1344 cesium magnetometer with a Scintrex CS3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. In addition to the survey recorded data from a raster altimeter, GPS navigation system, 30/60 Hz monitors and video camera. Flights were performed with an AS350B-3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (0°) 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.

A Novatel OEM4-C2L 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 5m. Flight path positions were projected onto the Clarke 1866 (UTM zone 6) spheroid, 1927 North American datum using a central meridian (CM) of 147°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10m with respect to the UTM grid.

**ELECTROMAGNETIC ANOMALIES**



**ELECTROMAGNETICS**

To determine the location of EM anomalies or their boundaries, the DIGHEMV EM system measured inphase and quadrature components at five frequencies. Two vertical coplanar-coil pairs operated at 1000 and 5500 Hz while three horizontal coplanar-coil pairs operated at 900, 7200, and 55,000 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 geomagnetic map by the interpretive symbol attached to each EM anomaly. Determination of the type of conductor is based on EM anomaly shapes of the in-phase and quadrature 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**

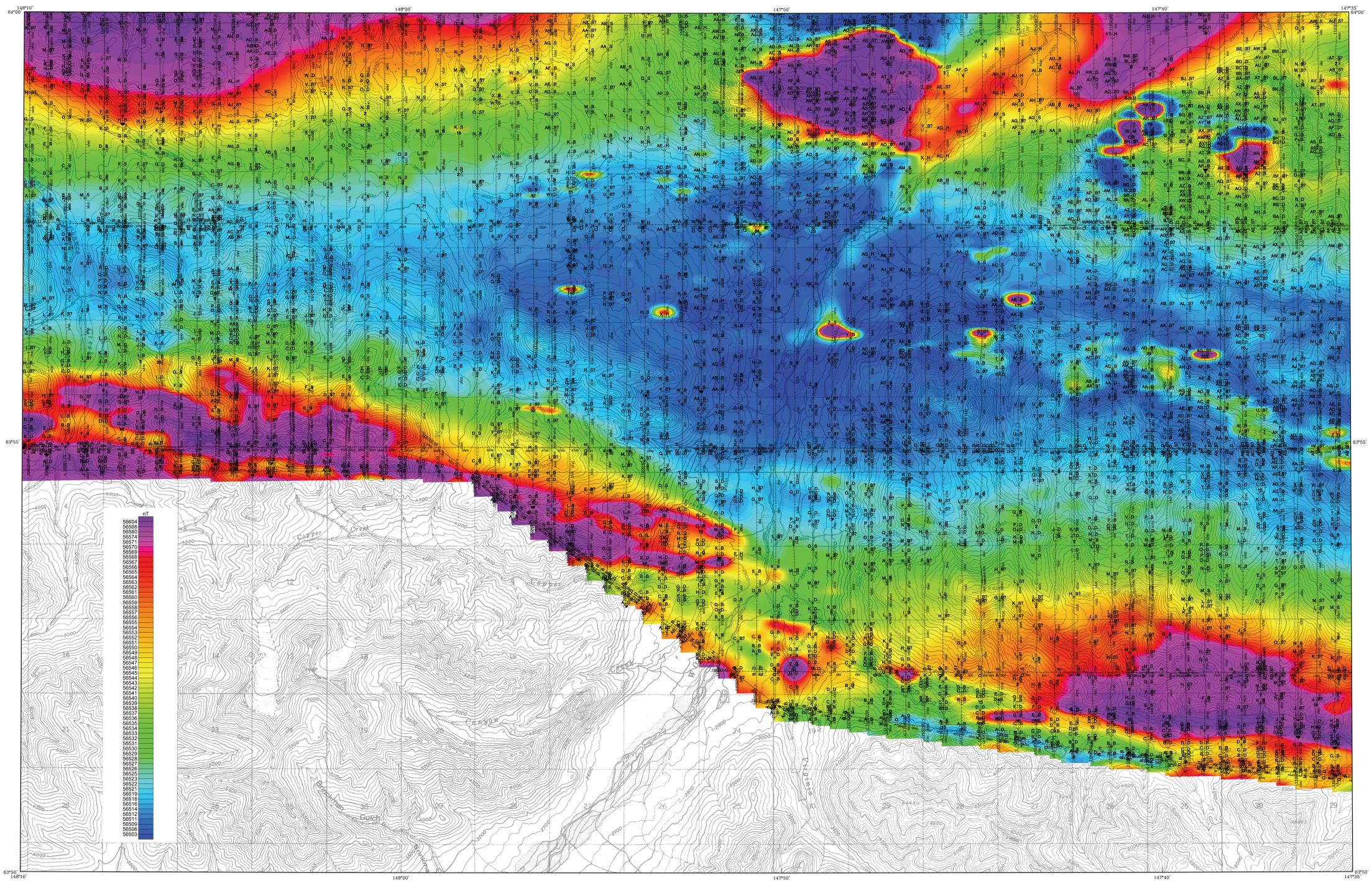
The magnetic total field data were processed using digitally recorded data from a Fugro D1344 cesium magnetometer with a Scintrex CS3 sensor. Data were collected at a sampling interval of 0.1 seconds. The magnetic data were (1) corrected for diurnal variations by subtraction of the digitally recorded base station magnetic data, (2) adjusted for regional variations (or IGRF gradient, 2005, updated to November 2006) using allmeter adjusted (IGRF, 3) leveled to the tie line data, and (4) interpolated onto a regular 80 m grid using a modified Akima (1970) technique.

**SURVEY HISTORY**

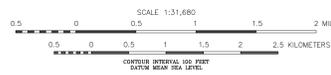
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AKIMA, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures, Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589-602.



Base from U.S. Geological Survey Healy D-2, 1963, D-3, 1966; Quadrangle, Alaska.

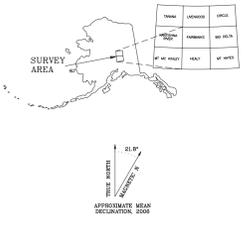
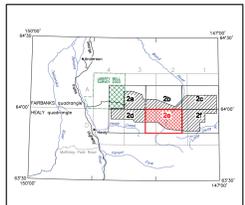


# TOTAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES OF PARTS OF THE BONNIFIELD MINING DISTRICT, INTERIOR ALASKA

## PARTS OF HEALY D-2 and D-3 QUADRANGLES

by  
**Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.**  
2007

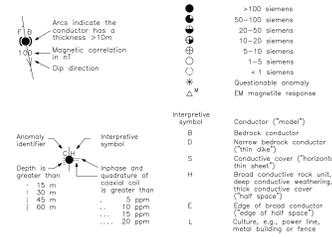
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### DESCRIPTIVE NOTES

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### ELECTROMAGNETIC ANOMALIES



### ELECTROMAGNETICS

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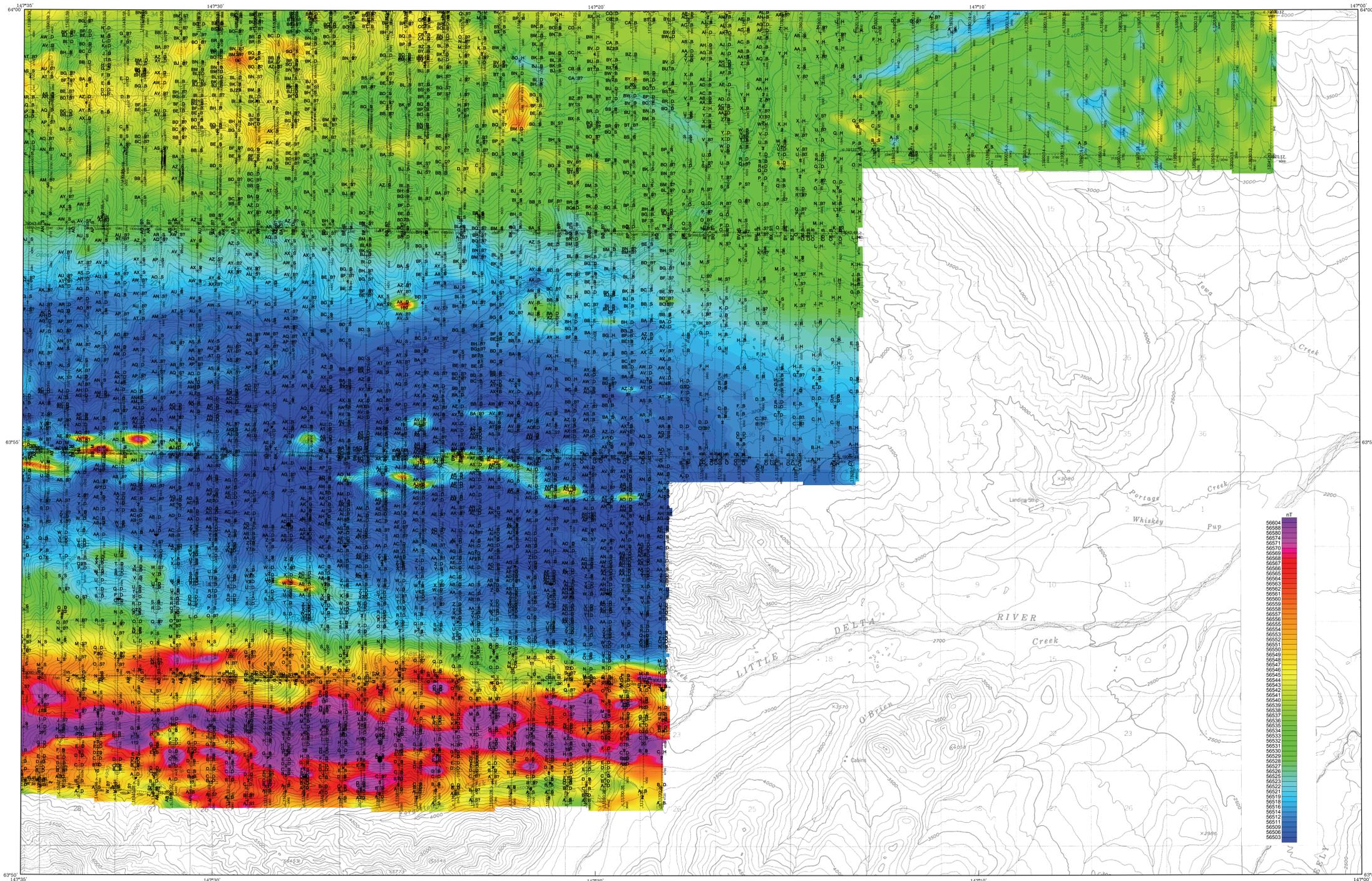
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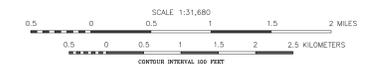
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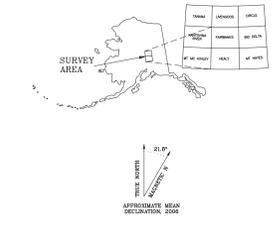
Base from U.S. Geological Survey Healy D-1, 1976; D-2, 1969. Quadrangles, Alaska.



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by  
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2007



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APPROXIMATE MEAN DECLINATION 2006

**ELECTROMAGNETIC ANOMALIES**

- Anomaly
- Area indicate the conductor thickness >10m
- Magnetic correlation
- Dip direction

- Interpretive symbols**
- Conductor (mode)
  - B Betatek conductor
  - T Thin sheet conductor
  - S Conductive cover (horizontal thin sheet)
  - H Conductive cover (horizontal thin sheet)
  - E Edge of broad conductor
  - L Loop of broad conductor
- Depth**
- Inphase and quadrature of copal coil
  - 15 m
  - 10 ppm
  - 15 ppm
  - 20 ppm

- Conductance**
- >100 siemens
  - 50-100 siemens
  - 20-50 siemens
  - 10-20 siemens
  - 5-10 siemens
  - 1-5 siemens
  - < 1 siemens
  - Questionable anomaly
  - EM magnetic response

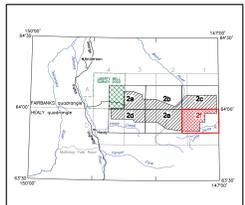
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