MORAN ELECTROMAGNETIC, MAGNETIC, AND RADIOMETRIC GEOPHYSICAL SURVEY DATA COMPILATION

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Exploration Management Corp.

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MORAN ELECTROMAGNETIC, MAGNETIC, AND RADIOMETRIC GEOPHYSICAL SURVEY DATA COMPILATION

L.E. Burns¹, G.R.C. Graham¹, J.D. Barefoot¹, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.

ABSTRACT

The Moran electromagnetic, magnetic, and radiometric airborne geophysical survey is located in interior Alaska in the Melozitna and Hot Springs mining districts, about 225 kilometers southeast of Fairbanks. Frequency domain electromagnetic, magnetic, and radiometric data were collected with the DIGHEM^V system from July to August 2009. A total of 4,685.9 line kilometers were collected covering 1,691.3 square kilometers. Line spacing was 400 meters (m). Data were collected 30 m above the ground surface from a helicopter towed sensor platform ("bird") on a 30 m long line.

PURPOSE

This airborne geophysical survey is part of a program to acquire data on Alaska's most promising mineral belts and districts. The information acquired is aimed at catalyzing new private-sector exploration, discovery, and ultimate development and production. The purpose of the survey was to map the magnetic and conductive properties of the survey area and provide insight into possible locations of gold-related intrusions, and high-and low-angle fault sets related to mineralizing systems. The Melozitna mining district has a long history of placer gold mining, but there is little to no current production.

SURVEY OVERVIEW DESCRIPTION

This document provides an overview of the survey and includes text and figures of select primary and derivative products of this survey. A table of digital data packages available for download is provided to assist users in data selection. For reference, a catalog of the available maps is presented in reduced resolution. Please consult the metadata, project report, and digital data packages for more information and data.

ACKNOWLEDGMENTS

Funding was provided by the Alaska State Legislature as part of the DGGS Airborne Geophysical/Geological Mineral Inventory (AGGMI) program.

¹ Alaska Division of Geological & Geophysical Surveys, 3354 College Road, Fairbanks, Alaska 99709

AVAILABLE DATA

Data Type	Provider	Description
ascii_data	contractor	ASCII format line data, other ASCII data
databases_geosoft	contractor	Geosoft format database of final line data, other Geosoft format databases
documents	contractor and DGGS	Project and field reports, survey background information, gridded data explanations, other documentation
grids_ermapper	contractor	Geographically registered gridded data, ER Mapper ERS format
grids_geosoft	contractor and DGGS	Geosoft-format grids, these grids can be viewed in ESRI ArcMap using a free plugin from Geosoft or the free viewer available from Geosoft
images_registered	DGGS	GeoTiff format images of all gridded data
kmz	DGGS	Keyhole markup language (kml) kmz archive files of project data. Viewable in Google Earth and other compatible programs
maps_pdf_format	contractor	Printable maps in pdf format
maps_prn_format	contractor	Printable maps in HPGL/2 printer file format with extension .prn
profiles_stacked	contractor	Distance-based profiles of the digitally recorded geophysical data are generated and plotted at an appropriate scale. The profiles display electromagnetic anomalies with their respective interpretive symbols. Printable in pdf format
vector_data	contractor and DGGS	Line path, data contours, and survey boundary in ESRI shapefile (SHP) format, ESRI Geodatabase format, and/or AutoCAD dxf format
video_flightpath	contractor	Survey flight path downward facing video

REFERENCES

- 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, n. 4, p. 589–602.
- Burns, L.E., Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp., 2010, Line, grid, and vector data, and maps for the airborne geophysical survey of the Moran Survey Area, Melozitna and Tanana quadrangles, central Alaska: Alaska Division of Geological & Geophysical Surveys Geophysical Report 2010-1, 56 sheets, scale 1:63,360, 1 DVD. <http://doi.org/10.14509/20561>
- International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

Figure 1. Moran electromagnetic and magnetic airborne geophysical survey location shown in southcentral Alaska (inset). Moran survey area shown with adjacent DGGs geophysical surveys, landmarks, relevant 1:250,000-scale quadrangle boundaries, mountain ranges, rivers, glaciers, and elevation hillshade.

Figure 2. Flight path with orthometric image.

Figure 3. Residual Magnetic Field grid with orthometric image. The magnetic total field data were created using digitally recorded data from a Fugro D1344 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 subtracting the digitally recorded base station magnetic data, (2) IGRF corrected (IGRF model 2005, updated for date of flight and altimeter variations), (3) leveled to the tie line data, and (4) interpolated onto a regular 80 m grid using a modified Akima (1970) technique.

Figure 4. Simulated Magnetic Total Field grid with orthometric image. The simulated magnetic total field data were created using digitally recorded data from a Fugro D1344 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 subtracting the digitally recorded base station magnetic data, (2) IGRF corrected (IGRF model 2010, updated for date of flight and altimeter variations), (3) leveled to the tie line data, (4) a constant value of approximately 56,000 nT was added to all data, and (5) interpolated onto a regular 80 m grid using a modified Akima (1970) technique.

Figure 5. Calculated First Vertical Derivative grid with orthometric image. The first vertical derivative grid was calculated from the diurnally-corrected, IGRF-corrected 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.

Figure 6. Analytic Signal grid with orthometric image. Analytic signal is the total amplitude of all directions of magnetic gradient calculated from the sum of the squares of the three orthogonal gradients. Mapped highs in the calculated analytic signal of magnetic parameter locate the anomalous source body edges and corners (such as contacts, fault/shear zones, etc.). Analytic signal maxima are located directly over faults and contacts, regardless of structural dip, and independent of the direction of the induced and/or remanent magnetizations.

Figure 7. Magnetic Tilt Derivative grid with orthometric image. The tilt derivative is the angle between the horizontal gradient and the total gradient, which is useful for identifying the depth and type of source. The tilt angle is positive over the source, crosses through zero at, or near, the edge of a vertical sided source, and is negative outside the source region. It has the added advantage of responding equally well to shallow and deep sources and is able to resolve deeper sources that may be masked by larger responses from shallower sources.

Figure 8. 56,000 Hz coplanar Apparent Resistivity grid with orthometric image. The DIGHEM[®] EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1000 and 5500 Hz while three horizontal coplanar coil-pairs operated at 900, 7,200, 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.

Figure 9. 7,200 Hz coplanar Apparent Resistivity grid with orthometric image. The DIGHEM[®] EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1000 and 5500 Hz while three horizontal coplanar coil-pairs operated at 900, 7,200, 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 7,200 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 80 m grid using a modified Akima (1970) technique.

Figure 10. 900 Hz coplanar Apparent Resistivity grid with orthometric image. The DIGHEM[®] EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1000 and 5500 Hz while three horizontal coplanar coil-pairs operated at 900, 7,200, 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.

Figure 11. Equivalent Thorium grid with orthometric image. The gamma-ray spectrometry data were recorded at a 1.0 second sample rate into a 256 channel main and radon spectra using a Radiation Solutions RS-500 gamma-ray spectrometer. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 60 m. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique.

Figure 12. Equivalent Uranium grid with orthometric image. The gamma-ray spectrometry data were recorded at a 1.0 second sample rate into a 256 channel main and radon spectra using a Radiation Solutions RS-500 gamma-ray spectrometer. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 60 m. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique.

Figure 13. Percent Potassium grid with orthometric image. The gamma-ray spectrometry data were recorded at a 1.0 second sample rate into a 256 channel main and radon spectra using a Radiation Solutions RS-500 gamma-ray spectrometer. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 60 m. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique.

Figure 14. Ratio of Equivalent Thorium to Percent Potassium grid with orthometric image. The gamma-ray spectrometry data were recorded at a 1.0 second sample rate into a 256 channel main and radon spectra using a Radiation Solutions RS-500 gamma-ray spectrometer. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 60 m. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique.

Figure 15. Ratio of Equivalent Uranium to Percent Potassium grid with orthometric image. The gamma-ray spectrometry data were recorded at a 1.0 second sample rate into a 256 channel main and radon spectra using a Radiation Solutions RS-500 gamma-ray spectrometer. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 60 m. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique.

Figure 16. Ratio of Equivalent Uranium to Equivalent Thorium grid with orthometric image. The gamma-ray spectrometry data were recorded at a 1.0 second sample rate into a 256 channel main and radon spectra using a Radiation Solutions RS-500 gamma-ray spectrometer. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 60 m. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique.

Figure 17. Total Air Absorbed Dose Rate grid with orthometric image. The gamma-ray spectrometry data were recorded at a 1.0 second sample rate into a 256 channel main and radon spectra using a Radiation Solutions RS-500 gamma-ray spectrometer. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 60 m. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique.

Table 1. Copies of the following maps are included at the end of this booklet. The low-resolution, page-size maps included in this booklet are intended to be used as a search tool and are not the final product. Large-scale, full-resolution versions of each map are available to download on this publication's citation page: <http://doi.org/10.14509/30201>.

Map Title	Description
moran_sim_magtf_topo_map_1of2.pdf	simulated total magnetic field grid with topographic base map
moran_sim_magtf_topo_map_2of2.pdf	simulated total magnetic field grid with topographic base map
moran_sim_magtf_contours_plss_map_1of2.pdf	simulated total magnetic field grid with data contours and public land survey system base layer
moran_sim_magtf_contours_plss_map_2of2.pdf	simulated total magnetic field grid with data contours and public land survey system base layer
moran_analyticsignal_topo_map_1of2.pdf	analytic signal grid with topographic base map
moran_analyticsignal_topo_map_2of2.pdf	analytic signal grid with topographic base map
moran_analyticsignal_contours_plss_map_1of2.pdf	analytic signal grid with data contours and public land survey system base layer
moran_analyticsignal_contours_plss_map_2of2.pdf	analytic signal grid with data contours and public land survey system base layer
moran_calculated1vd_topo_map_1of2.pdf	calculated first vertical derivative grid of the simulated total magnetic field with topographic base map
moran_calculated1vd_topo_map_2of2.pdf	calculated first vertical derivative grid of the simulated total magnetic field with topographic base map
moran_tiltderivative_topo_map_1of2.pdf	magnetic tilt derivative grid with topographic base map
moran_tiltderivative_topo_map_2of2.pdf	magnetic tilt derivative grid with topographic base map
moran_tiltderivative_contours_plss_map_1of2.pdf	magnetic tilt derivative grid with data contours and public land survey system base layer
moran_tiltderivative_contours_plss_map_2of2.pdf	magnetic tilt derivative grid with data contours and public land survey system base layer
moran_res56khz_topo_map_1of2.pdf	56,000 Hz apparent resistivity grid with topographic base map
moran_res56khz_topo_map_2of2.pdf	56,000 Hz apparent resistivity grid with topographic base map
moran_res56khz_contours_plss_map_1of2.pdf	56,000 Hz apparent resistivity grid with data contours and public land survey system base layer
moran_res56khz_contours_plss_map_2of2.pdf	56,000 Hz apparent resistivity grid with data contours and public land survey system base layer
moran_res7200hz_topo_map_1of2.pdf	7,200 Hz apparent resistivity grid with topographic base map
moran_res7200hz_topo_map_2of2.pdf	7,200 Hz apparent resistivity grid with topographic base map

Table 1, continued. Copies of the following maps are included at the end of this booklet. The low-resolution, page-size maps included in this booklet are intended to be used as a search tool and are not the final product. Large-scale, full-resolution versions of each map are available to download on this publication's citation page: <http://doi.org/10.14509/30201>.

Map Title	Description
moran_res7200hz_contours_plss_map_1of2.pdf	7,200 Hz apparent resistivity grid with data contours and public land survey system base layer
moran_res7200hz_contours_plss_map_2of2.pdf	7,200 Hz apparent resistivity grid with data contours and public land survey system base layer
moran_res900hz_topo_map_1of2.pdf	900 Hz apparent resistivity grid with topographic base map
moran_res900hz_topo_map_2of2.pdf	901 Hz apparent resistivity grid with topographic base map
moran_res900hz_contours_plss_map_1of2.pdf	900 Hz apparent resistivity grid with data contours and public land survey system base layer
moran_res900hz_contours_plss_map_2of2.pdf	901 Hz apparent resistivity grid with data contours and public land survey system base layer
moran_emanomalies_sim_magtf_detailed_topo_map_1of6.pdf	detailed map of EM anomalies with simulated total magnetic field grid and topographic base map
moran_emanomalies_sim_magtf_detailed_topo_map_2of6.pdf	detailed map of EM anomalies with simulated total magnetic field grid and topographic base map
moran_emanomalies_sim_magtf_detailed_topo_map_3of6.pdf	detailed map of EM anomalies with simulated total magnetic field grid and topographic base map
moran_emanomalies_sim_magtf_detailed_topo_map_4of6.pdf	detailed map of EM anomalies with simulated total magnetic field grid and topographic base map
moran_emanomalies_sim_magtf_detailed_topo_map_5of6.pdf	detailed map of EM anomalies with simulated total magnetic field grid and topographic base map
moran_emanomalies_sim_magtf_detailed_topo_map_6of6.pdf	detailed map of EM anomalies with simulated total magnetic field grid and topographic base map
moran_rad_equiv_th_topo_map_1of2.pdf	equivalent thorium grid with topographic base map
moran_rad_equiv_th_topo_map_2of2.pdf	equivalent thorium grid with topographic base map
moran_rad_equiv_th_contours_plss_map_1of2.pdf	equivalent thorium grid with data contours and public land survey system base layer
moran_rad_equiv_th_contours_plss_map_2of2.pdf	equivalent thorium grid with data contours and public land survey system base layer
moran_rad_equiv_u_topo_map_1of2.pdf	equivalent uranium grid with topographic base map
moran_rad_equiv_u_topo_map_2of2.pdf	equivalent uranium grid with topographic base map
moran_rad_equiv_u_contours_plss_map_1of2.pdf	equivalent uranium grid with data contours and public land survey system base layer
moran_rad_equiv_u_contours_plss_map_2of2.pdf	equivalent uranium grid with data contours and public land survey system base layer

Table 1, continued. Copies of the following maps are included at the end of this booklet. The low-resolution, page-size maps included in this booklet are intended to be used as a search tool and are not the final product. Large-scale, full-resolution versions of each map are available to download on this publication's citation page: <http://doi.org/10.14509/30201>.

Map Title	Description
moran_rad_pct_k_topo_map_1of2.pdf	percent potassium grid with topographic base map
moran_rad_pct_k_topo_map_2of2.pdf	percent potassium grid with topographic base map
moran_rad_pct_k_contours_plss_map_1of2.pdf	percent potassium grid with data contours and public land survey system base layer
moran_rad_pct_k_contours_plss_map_2of2.pdf	percent potassium grid with data contours and public land survey system base layer
moran_rad_ratio_th_k_topo_map_1of2.pdf	ratio of equivalent thorium to percent potassium grid with topographic base map
moran_rad_ratio_th_k_topo_map_2of2.pdf	ratio of equivalent thorium to percent potassium grid with topographic base map
moran_rad_ratio_th_k_contours_plss_map_1of2.pdf	ratio of equivalent thorium to percent potassium grid with data contours and public land survey system base layer
moran_rad_ratio_th_k_contours_plss_map_2of2.pdf	ratio of equivalent thorium to percent potassium grid with data contours and public land survey system base layer
moran_rad_ratio_u_k_topo_map_1of2.pdf	ratio of equivalent uranium to percent potassium grid with topographic base map
moran_rad_ratio_u_k_topo_map_2of2.pdf	ratio of equivalent uranium to percent potassium grid with topographic base map
moran_rad_ratio_u_k_contours_plss_map_1of2.pdf	ratio of equivalent uranium to percent potassium grid with data contours and public land survey system base layer
moran_rad_ratio_u_k_contours_plss_map_2of2.pdf	ratio of equivalent uranium to percent potassium grid with data contours and public land survey system base layer
moran_rad_ratio_u_th_topo_map_1of2.pdf	ratio of equivalent uranium to equivalent thorium grid with topographic map
moran_rad_ratio_u_th_topo_map_2of2.pdf	ratio of equivalent uranium to equivalent thorium grid with topographic map
moran_rad_ratio_u_th_contours_plss_map_1of2.pdf	ratio of equivalent uranium to equivalent thorium grid with data contours and public land survey system base layer
moran_rad_ratio_u_th_contours_plss_map_2of2.pdf	ratio of equivalent uranium to equivalent thorium grid with data contours and public land survey system base layer
moran_rad_tadr_topo_map_1of2.pdf	total air absorbed dose rate grid with topographic base map
moran_rad_tadr_topo_map_2of2.pdf	total air absorbed dose rate grid with topographic base map
moran_rad_tadr_contours_plss_map_1of2.pdf	total air absorbed dose rate grid with data contours and public land survey system base layer
moran_rad_tadr_contours_plss_map_2of2.pdf	total air absorbed dose rate grid with data contours and public land survey system base layer
moran_rad_ternary_topo_map_1of2.pdf	radiometric ternary grid with topographic base map
moran_rad_ternary_topo_map_2of2.pdf	radiometric ternary grid with topographic base map

The geophysical data were acquired with a DIGHEM Electromagnetic (EM) system, Radiation Solutions Inc., model EM-60S, mounted on a motorized vehicle. The D134 magnetometer was by a Schlumberger CESI cesium magnetometer. The magnetic field was measured at a distance from a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet, and the GPS receiver was mounted on the vehicle. Laser altimeters, GPS navigation system, and a differential GPS system were used. Data collection was performed with an AS-350-B3 Sauriau receiver. The flight track was approximately 200 feet along N-S (0°) survey flight lines with cross-track flight lines perpendicular to the flight lines every interval of approximately 3 miles.

A Novatel GEN-22 Global Positioning System (GPS) receiver was used. The GPS system was derived every 5 seconds using post-flight processing. The accuracy of the GPS system was better than 1 m. Flight path positions were determined by a least squares fit to the GPS data. A spheroid, 1927 North American datum using a semi-major axis of 6378 km and a flattening factor of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 1 m.

TOTAL MAGNETIC FIELD

The magnetic total field data were processed using digitally recorded data from a Fugro D1344 magnetic survey system. The 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) IGRF corrected (IGRF model 2005, updated for date of flight and trimmer variations), (3) leveled to the tie line data, and (4) interpolated onto a regular 80 m grid using a modified Akima (1970) technique. All grids were then resampled from the 80 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

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.

This map has been compiled and drawn under contract between the State Department of Natural Resources, Division of Geological & Geophysical Surveys (DGG&S), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired during the 1970s and 1980s, and were updated in 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program.

All data and maps produced to date from this survey are available online at www.dgg&s.state.ak.us/pubs for a nominal fee through DGG&S, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGG&S website (www.dgg&s.state.ak.us/pubs). Maps are also available on paper through the DGG&S office, and are available online at the website in Adobe Acrobat .PDF file format.

Base from U.S. Geological Survey Bulletin A-1, 1970; B-1, 1970; T-1, 1970; A-2, 1980; B-2, 1970; and C-1, 1970.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM V (Digital High-Resolution) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Scintrex CS3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition, the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (2°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L 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 5) spheroid, 1927 North American datum using a central meridian (CM) of 153° 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.

TOTAL MAGNETIC FIELD OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

TOTAL MAGNETIC FIELD

The magnetic total field data were processed using digitally recorded data from a Fugro D1344 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) IGRF corrected (IGRF model 2005, updated for date of flight and altimeter variations), (3) leveled to the tie line data, and (4) interpolated onto a regular 80 m grid using a modified Akima (1970) technique. All grids were then resampled from the 80 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

Alaska, 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.

LOCATION INDEX

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 area were acquired and processed by Fugro Airborne Surveys Corp. in 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGS, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGS website (www.dggs.dnr.state.ak.us/pub/). Maps are also available on paper through the DGGS office and are viewable online at the website in Adobe Acrobat PDF file format.

Derives outline from U.S. Geological Survey Bulletin A-1, 1972, A-2, 1972, B-1, 1976, B-2, 1976, Delineation, Alaska.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Schriener CS3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Sabre helicopter at a mean terrain clearance of 200 feet along N-S (or) survey flight lines with a spacing of a quarter of a mile. The tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles. A Novatel OEM4-G2L 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 5) spheroid, 1927 North American datum using a central meridian (CM) of 153° 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 OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

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2010

TOTAL MAGNETIC FIELD

The magnetic total field data were processed using digitally recorded data from a Fugro D1344 magnetometer with a Schriener 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) IGRF corrected (IGRF model 2005, updated for date of flight and altimeter variations), (3) leveled to the tie line data, and (4) interpolated onto a regular 80 m grid using a modified Akima (1970) technique. All grids were then resampled from the 80 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

Alaska, 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

LOCATION INDEX

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 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program. All data and maps produced to date from this survey are available in digital format as DTD for a nominal fee through DGGG, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGG website (www.dggg.alaska.gov/pubs). Maps are also available on paper through the DGGG office, and are viewable online at the website in Adobe Acrobat PDF file format.

Station Office Map U.S. Geological Survey Bulletin A-1, 1971; B-1, 1974;
 T-1, 1976; A-2, 1980; B-2, 1972; Washington, Alaska

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEMV Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Sinterex C33 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (Z) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L 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 1 cm. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) 1927 North American datum using a central meridian (CM) of 153° 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.

TOTAL MAGNETIC FIELD

The magnetic total field data were processed using digitally recorded data from a Fugro D1344 magnetometer with a Sinterex C33 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) IGR corrected (IGR model 2005, updated for date of flight and altimeter variations), (3) leveled to the tie line data, and (4) interpolated onto a regular 80 m grid using a modified Aluma (1970) technique. All grids were then resampled from the 80 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

Aluma, 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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Base from U.S. Geological Survey 1:50,000 A-1, 1971; A-2, 1972; B-1, 1970; B-2, 1970; and 1971.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Schlumberger CS3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (or) 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-G2L 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 5) spheroid, 1927 North American datum using a central meridian (CM) of 153° 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.

ANALYTIC SIGNAL OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

LOCATION INDEX

ANALYTIC SIGNAL

Analytic signal is the total amplitude of all directions of magnetic gradient calculated from the sum of the squares of the three orthogonal gradients. Mapped highs in the calculated analytic signal of magnetic parameter locate the anomalous source body edges and corners (e.g., contacts, fault/shear zones, etc.). Analytic signal maxima are located directly over faults and contacts, regardless of structural dip, and independently of the direction of the induced and/or remanent magnetizations.

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 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program. All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGG, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGG website (www.dggg.dnr.state.ak.us/gpubs). Maps are also available on paper through the DGGG office, and are viewable online at the website in Adobe Acrobat PDF file format.

Base from U.S. Geological Survey Bulletin A-1, 1970; B-1, 1970; Tanana A-6, 1960; B-6, 1970; Gooding, Alaska.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM V Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Scintrex G33 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (Z) 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-G2L 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 1 cm. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153° 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.

ANALYTIC SIGNAL OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

LOCATION INDEX

ANALYTIC SIGNAL

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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 area were acquired and processed by Fugro Airborne Surveys Corp. in 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program. All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGS, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGS website (www.dggs.dnr.state.ak.us/pub/). Maps are also available on paper through the DGGS office and are viewable online at the website in Adobe Acrobat PDF file format.

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

[illegible]

Analytic signal is the total amplitude of all directions of magnetic gradient calculated from the sum of the squares of the three orthogonal gradients. Mapped highs in the calculated analytic signal of magnetic parameter locate the anomalous source body edges and corners (e.g., contacts, fault/shear zones, etc.). Analytic signal maxima are located directly over faults and contacts, regardless of structural dip, and independently of the direction of the induced and/or remanent magnetizations.

_____		1.00 nT/metre
_____		0.20 nT/metre
_____		0.04 nT/metre
_____		0.02 nT/metre

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGG&S), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired in 1997 and 1998 by Stevens Exploration Management Corp. and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program.

All data and maps produced to date from this survey are in digital format and are available for a nominal fee through DGG&S, 3354 Colville Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGG&S website (www.dggs.dr.state.ak.us/pub/). Maps are also available on paper through the DGG&S office, and are available online at the website in Adobe Acrobat, .PDF file format.

Section outlines from U.S. Geological Survey Bulletin A-1, 1971; B-1, 1974; T-1, 1980; A-2, 1980; B-2, 1972; and Bulletin A-3, 1974.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEMV Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D134 magnetometer with a Scintrex C33 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Seahawk helicopter at a mean terrain clearance of 200 feet along N-S (Z) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L 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 1 cm. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) central meridian (CM) of 153° 0' north constant of 0 and are east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

ANALYTIC SIGNAL

Analytic signal is the total amplitude of all directions of magnetic gradient calculated from the sum of the squares of the three orthogonal gradients. Mapped highs in the calculated analytic signal of magnetic parameter locate the anomalous source body edges and corners (e.g., contacts, fault/shear zones, etc.). Analytic signal maxima are located directly over faults and contacts, regardless of structural dip, and independently of the direction of the induced and/or remanent magnetizations.

ANALYTIC SIGNAL CONTOURS

.....	1.00 nT/metre
.....	0.20 nT/metre
.....	0.04 nT/metre
.....	0.02 nT/metre

LOCATION INDEX

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 area were acquired and processed by Fugro Airborne Surveys Corp. in 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program. All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGS, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGS website (www.dggs.dnr.state.ak.us/pub/). Maps are also available on paper through the DGGS office and are viewable online at the website in Adobe Acrobat PDF file format.

The geophysical data were acquired with a DIGHEM Electromagnetic (EM) system, Radiation Solutions International Inc., which was mounted on a GEOMAG D1344 magnetometer with a Schriever CS3 cesium magnetometer. The EM system was towed by a motor launch at a height of 100 feet above the gamma-ray spectrometer was flown at a height of 200 feet, and laser altimeters, GPS navigation system, and real-time processing software were used. Data were performed with an AS-350-B3 Saurfield magnetometer. The flight track consisted of approximately 200 feet along N-S (ϕ) survey flight lines and E-W (ψ) survey flight lines perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel GEG2L Global Positioning System (GPS) receiver was used to provide position data. It was derived every 0.5 seconds using post-flight processing. The accuracy of the GPS data was better than 8 m. Flight path positions were determined from ground control points (GCPs), which were located near the flight track. The GCPs were located in the area of 1975 North American datum using a differential correction technique. The accuracy of 0 and an east constant of 500,000m. Positional accuracy of the presented data is better than 10 m.

PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010 FIRST MEDICAL BOOK

FIRST VERTICAL DERIVATIVE OF
THE MAGNETIC FIELD

THE MAGNETIC FIELD

The first grid was the data collected using digitally recorded data from a Fugro D1344 magnetometer with a Sinterex CS3 cesium sensor. Data were collected at a sampling interval of 0.2 seconds. The second grid was the data collected using variations by subtraction of the digitally recorded static magnetic data, (2) IGRF corrected (IGRF model 2005) magnetic data, (3) corrected for magnetic variations, (3) leveled to the tie line data, and (4) interpolated onto a regular 80 m grid using a modified Akima (1970) technique. The grids were then resampled to a regular 40 m grid. The final grids were used to produce the maps and final grids contained in this publication. The first vertical derivative grid was produced by applying a 100 m derivative kernel using a FFT base frequency domain filtering algorithm. The resulting first vertical derivative grid provides better resolution results than the original magnetic data and helps to identify weak magnetic features that may

COLOR BAR HISTOGRAM

Approximately 98% of the first vertical derivative of the magnetic field for the Moran Survey Area dataset lie within the range displayed on the color bar. Data values actually range from -6.597 nT/m (dark blue) to about 11.931 nT/m (magenta).

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 (DGG&S), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired by Stevens Exploration Management Corp. in 1997 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program.

All data and maps produced to date from this survey are available online for a nominal fee for a nominal fee through DGG&S, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGG&S website (www.dgg&s.dnr.state.ak.us/pubs). Maps are also available on paper through the DGG&S office, and are available online at the website in Adobe Acrobat (.pdf) file format.

Base from U.S. Geological Survey Bulletin A-5, 1970; B-4, 1970; T-10, 1970; and T-11, 1970.

Scale 1:63,360

0 1 2 3 4 MILES

0 1 2 3 4 KILOMETERS

150°10' 150°00' 149°50' 149°40'

60°10' 60°00' 59°50' 59°40'

150°10' 150°00' 149°50' 149°40'

60°10' 60°00' 59°50' 59°40'

150°10' 150°00' 149°50' 149°40'

60°10' 60°00' 59°50' 59°40'

150°10' 150°00' 149°50' 149°40'

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150°10' 150°00' 149°50' 149°40'

60°10' 60°00' 59°50' 59°40'

150°10' 150°00' 149°50' 149°40'

60°10' 60°00' 59°50' 59°40'

FIRST VERTICAL DERIVATIVE OF THE MAGNETIC FIELD OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

FIRST VERTICAL DERIVATIVE OF

The magnetic total field data were processed using digitally recorded data from a Fugro D1344 magnetometer with a Schlumberger 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) IGR corrected (IGR model 2005), updated for date of flight and altimeter variations, (3) leveled to the tie line data, and (4) interpolated onto a regular 80 m grid using a modified Akima (1970) technique. All grids were then resampled from the 80 m cell size down to a 20 m cell size to produce the maps and final grids contained in this publication. 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.

Aluma, 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.

COLOR BAR HISTOGRAM

Approximately 98% of the first vertical derivative of the magnetic field for the Moran Survey Area dataset lie within the range displayed on the color bar. Data values actually range from -6.597 nT/m (dark blue) to about 11.931 nT/m (magenta).

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM V Electromagnetic (EM) system. Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Schlumberger CS3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (or) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L 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 5) standard 1927 North American datum using a central meridian (CM) of 153° 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.

LOCATION INDEX

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 (DGGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys Corp. in 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program. All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGGS, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGGS website (www.dggs.alaska.gov/ada/un/yuba). Maps are also available on paper through the DGGGS office and are viewable online at the website in Adobe Acrobat PDF file format.

The geophysical data were acquired with a DIGHWY Electromagnetic (EM) system, Radiation Solutions Inc., model EM-600, which consists of a dual-coil D1544 magnetometer with a Schlumberger CS5 cesium sensor, mounted on a height of 10 m above the ground. The spectrometer was flown at a height of 200 feet, with a track spacing of 10 m. Data collection was done by laser altimeters, GPS navigation system, and real-time processing software. All data collection was performed with an AS-350-B3 Stratquest helicopter flying along N-S (0°) survey flight lines with a spacing of a quarter of a mile. The flight lines are spaced at intervals of approximately 3 miles.

A Novatel OEM4-G2L Global Positioning System (GPS) receiver was used to provide precise timing. It was derived every 0.5 seconds using post-flight differential correction. The accuracy of the GPS is better than 1 ns. Flight path positions were determined from a series of ground control points (GCPs), spheroid, 1927 North American datum using a central meridian (0°) of 153° , a north constant of 6300000 m, and a scale factor of 0.9996 . The accuracy of the presented data is better than ± 1 m.

PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

The tilt derivative is the angle between the horizontal gradient & the total gradient, which is useful for identifying the depth & type of source. The tilt angle is positive over the source, crosses through zero at, or near, the edge of a vertical sided source, and is negative outside the source region. It has the added advantage of responding equally well to shallow and deep sources and is able to resolve deeper sources that may be masked by larger responses from shallower sources.

Base from U.S. Geological Survey Bulletin A-1, 1970; B-1, 1970; Tanana A-6, 1960; B-6, 1970; Gadsdenville, Alaska.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEMY Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Scintrex G33 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Seahawk helicopter at a mean terrain clearance of 200 feet along N-S (Z) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L 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 10 cm. Flight path coordinates were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153° 0' north constant of 0 and east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

MAGNETIC TILT DERIVATIVE OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

MAGNETIC TILT DERIVATIVE

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Derives contour from U.S. Geological Survey Station A-1, 1972, A-2, 1972, B-1, 1976, B-2, 1977, Dismal, Alaska.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Schlumberger CS3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (or) 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-G2L 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 5) spheroid, 1927 North American datum using a central meridian (CM) of 153° 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.

MAGNETIC TILT DERIVATIVE

The tilt derivative is the angle between the horizontal gradient & the total gradient, which is useful for identifying the depth & type of source. The tilt angle is positive over the source, crosses through zero at, or near, the edge of a vertical sided source, and is negative outside the source region. It has the added advantage of responding equally well to shallow and deep sources and is able to resolve deeper sources that may be masked by larger responses from shallower sources.

MAGNETIC TILT DERIVATIVE CONTOURS

..... 50 degrees
..... 10 degrees

LOCATION INDEX

SURVEY HISTORY

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Section Outline Map U.S. Geological Survey Bulletin A-1, 1970; B-1, 1976;
 T-1, 1980; A-2, 1986; B-2, 1972; Fairbanks, Alaska

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEMV Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D134 magnetometer with a Scintrex C33 cell sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Seahawk helicopter at a mean terrain clearance of 200 feet along N-S (Z) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L 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 1 cm. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153° a 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.

MAGNETIC TILT DERIVATIVE

The tilt derivative is the angle between the horizontal gradient & the total gradient, which is useful for identifying the depth & type of source. The tilt angle is positive over the source, crosses through zero at, or near, the edge of a vertical sided source, and is negative outside the source region. It has the added advantage of responding equally well to shallow and deep sources and is able to resolve deeper sources that may be masked by larger responses from shallower sources.

MAGNETIC TILT DERIVATIVE CONTOURS

..... 50 degrees
 10 degrees

LOCATION INDEX

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 area were acquired and processed by Fugro Airborne Surveys Corp. in 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program. All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGS, 3554 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGS website (www.dggs.dnr.state.ak.us/pub/). Maps are also available on paper through the DGGS office and are viewable online at the website in Adobe Acrobat PDF file format.

Base Data: U.S. Geological Survey, 1:50,000, A-1, 1975, A-2, 1975, B-1, 1975, B-2, 1975, C-1, 1975, C-2, 1975, D-1, 1975, D-2, 1975, E-1, 1975, E-2, 1975, F-1, 1975, F-2, 1975, G-1, 1975, G-2, 1975, H-1, 1975, H-2, 1975, I-1, 1975, I-2, 1975, J-1, 1975, J-2, 1975, K-1, 1975, K-2, 1975, L-1, 1975, L-2, 1975, M-1, 1975, M-2, 1975, N-1, 1975, N-2, 1975, O-1, 1975, O-2, 1975, P-1, 1975, P-2, 1975, Q-1, 1975, Q-2, 1975, R-1, 1975, R-2, 1975, S-1, 1975, S-2, 1975, T-1, 1975, T-2, 1975, U-1, 1975, U-2, 1975, V-1, 1975, V-2, 1975, W-1, 1975, W-2, 1975, X-1, 1975, X-2, 1975, Y-1, 1975, Y-2, 1975, Z-1, 1975, Z-2, 1975.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Schlumberger CS3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (or) 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-G2L 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 5) spheroid, 1927 North American datum using a central meridian (CM) of 153° 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.

56,000 Hz COPLANAR APPARENT RESISTIVITY OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

RESISTIVITY

The DIGHEM[®] EM system measured inphase and quadrature components of the frequencies. Two vertical coil-pairs operated at 1000 and 5500 Hz while three horizontal coplanar coil-pairs operated at 500, 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. All grids were then resampled from the 80 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

Alkms, 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.

LOCATION INDEX

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 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program. All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGG, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGG website (www.dggg.dnr.state.ak.us/pubs). Maps are also available on paper through the DGGG office, and are viewable online at the website in Adobe Acrobat PDF file format.

Base from U.S. Geological Survey Bulletin A-1, 1970; B-1, 1970; T-1, 1970; A-4, 1980; B-4, 1970; Geographical Names

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Scintrex G33 cell sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AG-350C-23 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (or) 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-G2L 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 cm. Flight path datum were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153° a 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.

56,000 Hz COPLANAR APPARENT RESISTIVITY OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

RESISTIVITY

The DIGHEM[®] EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1000 and 5500 Hz while three horizontal coplanar coil-pairs operated at 800, 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-slayer half space model. All data were interpolated onto a regular 80 m grid using a modified Akima (1970) technique. All grids were then resampled from the 80 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

Alkima, 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.

LOCATION INDEX

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 (DGGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys Corp. in 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGGS, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGGS website (www.dgggs.dnr.state.ak.us/pub/). Maps are also available on paper through the DGGGS office and are viewable online at the website in Adobe Acrobat PDF file format.

The geophysical data were acquired with a DIGHEM Electromagnetic (EM) system, Radiation Solutions Inc., which consists of a 600-Hz induction coil mounted on a D1344 magnetometer with a Schriever CS5 cesium sensor. The magnetic field was measured by two orthogonal sensors oriented at right angles to each other. A fluxgate gradiometer was flown at a height of about 200 m; the magnetic field was flown at a height of 200 feet, and laser altimeters, GPS navigation system, and real-time kinematic (RTK) positioning system were performed on an AS-350-B3 SuperPuma helicopter. The flight track followed a series of parallel 200 feet along N-S (0°) survey flight lines with a spacing of a quarter of a mile. The flight lines were spaced approximately 3 miles.

A Novatel OEM4-G2L Global Positioning System (GPS) receiver was used to collect position data. It was derived every 0.5 seconds using post-flight processing. The accuracy of the GPS data was better than 1 m. Flight path positions were determined from ground control points (GCPs), i.e., a spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 100,000 ft, and a false easting of 500,000 ft. The accuracy of the presented data is better than 1 m.

PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

RESISTIVITY

The DIGHEM[®] EM system measures inphase and quadrature coil-pairs at 1000 and 5500 Hz, a vertical coaxial coil-pairs operated at 1000 and 5500 Hz while three horizontal coplanar coil-pairs operated at 900, 7200 and 56,000 Hz. EM data were sampled at 0.1 m intervals along a 100 m profile. The system uses truck-mounted, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 56,000 Hz using the $\frac{1}{2} \pi$ phase shift method. The data are then interpolated onto a regular 80 m grid using a modified Akima (1970) technique. All grids were then resampled from the 80 m cell size down to a 2 m cell size to produce the maps and final grids contained in this publication.

Akima, H., 1970. A new method of interpolation and smooth curve fitting based on local procedures: *Journal of the Association of Computational Machinery*, 17, 589-590.

LOCATION INDEX

SURVEY HISTORY

This map has been compiled and drawn under contract between the State Department of Natural Resources, Division of Geological & Geophysical Surveys (DGG&S), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired by Stevens Exploration Management Corp. in 1997 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee. The data are available in the following formats: Alaska 97908-3707, and are downloadable for free from the DGG&S website (www.dggs.dr.state.ak.us/pub/). Maps are also available on paper through the DGG&S office, and are available online at the website in Adobe Acrobat, .PDF file format.

The geophysical data were acquired with a HIGHWAY Electromagnetic (EM) system. Radiation Solutions RS-5400 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Sincritex C53 cesium magnetometer were mounted on a helicopter and flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and sidescan sonar. The EM system also included 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at altitudes of 100 and 200 feet along N-S (0°) survey flight lines with an interval of a quarter of a mile. The flights were flown perpendicular to the magnetic lineaments. The survey covered approximately 100 miles.

A Novatel OEM4-G2L 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 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000m. Positional accuracy of the presented data is better than 10m with respect to the UTM grid.

PARTS OF MELOZITNA and TANANA QUADRANGLES

The DIGHEM[®] EM system measured inphase and quadrature components at five frequencies: two vertical coplanar coils—pairs oriented at 90° and 1500 Hz while three horizontal coplanar coils—pairs oriented at 90°, 7200 and 56,000 Hz. EM data were sampled at 0.1 m intervals. The coplars were made of 1/8 in. diameter conductors, conductive overbraid, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the coplars. 56,000 Hz using the passive coil pair. The EM data were then resampled interpolated onto a regular 80 m grid using a modified Alamo (1970) technique. All grids were then resampled from the 80 m cell size and final to a 25 m cell size to produce the maps and final grids contained in this publication.

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 and Geophysical Surveys (DGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys Corp. in 2009 for the Alaska Department of Natural Resources, Alaska Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee. The data are available in digital format for the Alaska 90708-3707, and are downloadable for free from the DGGS website (www.dggs.dnr.state.ak.us/pubs). Maps are also available on paper through the DGGS office, and are available online at the website in Adobe Acrobat .PDF file format.

Base from U.S. Geological Survey 1:50,000 A-1, 1972; A-2, 1972; B-1, 1972; B-2, 1972; and 1:50,000 C-1, 1972.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Schlumberger CS3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (or) 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-G2L 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 5) spheroid, 1927 North American datum using a central meridian (CM) of 153° 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.

7200 Hz COPLANAR APPARENT RESISTIVITY OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

RESISTIVITY

The DIGHEM[®] EM system measured inphase and quadrature components of the frequencies. Two vertical coplanar coil-pairs operated at 1000 and 5500 Hz while three horizontal coplanar coil-pairs operated at 800, 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. All grids were then resampled from the 80 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

Alkema, 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.

LOCATION INDEX

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 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program. All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGG, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGG website (www.dggg.dnr.state.ak.us/pubs). Maps are also available on paper through the DGGG office, and are viewable online at the website in Adobe Acrobat PDF file format.

Base from U.S. Geological Survey Bulletin A-1, 1970; B-1, 1970; Tanana A-6, 1966; B-6, 1972; Goodwin, 1966.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Scintrex G33 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (or) 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-G2L 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 5) spheroid, 1927 North American datum using a central meridian (CM) of 153° 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.

7200 Hz COPLANAR APPARENT RESISTIVITY OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

RESISTIVITY

The DIGHEM[®] EM system measured inphase and quadrature components at five frequencies. Two vertical coil-pairs operated at 1000 and 5500 Hz while three horizontal coplanar coil-pairs operated at 800, 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. All grids were then resampled from the 80 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

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.

LOCATION INDEX

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 (DGGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys Corp. in 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGGS, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGGS website (www.dggs.dnr.state.ak.us/pub). Maps are also available on paper through the DGGGS office and are viewable online at the website in Adobe Acrobat PDF file format.

Derives outline from U.S. Geological Survey Bulletin A-1, 1972, A-2, 1972, B-1, 1976, B-2, 1976, and C-1, 1976.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Schlumberger CS3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Sabre helicopter at a mean terrain clearance of 200 feet along N-S (or) 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-G2L 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 5) spheroid, 1927 North American datum using a central meridian (CM) of 153° 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.

7200 Hz COPLANAR APPARENT RESISTIVITY OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PARTS OF MELOZITNA AND TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

RESISTIVITY

The DIGHEM[®] EM system measured inphase and quadrature components of the frequency. Two vertical coil-pairs operated at 1000 and 5500 Hz while three horizontal coplanar coil-pairs operated at 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. All grids were then resampled from the 80 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

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.

RESISTIVITY CONTOURS

LOCATION INDEX

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 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program. All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGG, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGG website (www.dggg.dnr.state.ak.us/pubs). Maps are also available on paper through the DGGG office, and are viewable online at the website in Adobe Acrobat PDF file format.

[illegible]

PARTS OF MELOZITNA and TANANA QUADRANGLES

The DIGHEM[®] EM system measured inphase and quadrature components at five frequencies: two vertical coplanar coil-pairs operated at 100 and 1500 Hz while three horizontal coplanar coil-pairs operated at 900, 7200 and 56,000 Hz. EM data were sampled at 0.1 m intervals. The EM system was used to map the conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 7200 Hz using the $\rho_a = 1000 \times Z_{\text{in}}/I$ relationship. The data were then interpolated onto a regular 80 m grid using a modified Akima (1970) technique. All grids were then resampled from the 80 m cell size and final to a 25 m cell size to produce the maps and final grids contained in this publication.

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 by the State Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys, Inc. in 2000 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGGS, 3554 College Avenue, Anchorage, Alaska, 99507-3707, and are downloadable for free from the DGGGS website (www.dgggs.dnr.state.ak.us/pubs). Maps are also available on paper through the DGGGS office, and are available online at the website in Adobe Acrobat PDF file format.

Base from U.S. Geological Survey 1:50,000 A-1, 1971; A-2, 1972; B-1, 1971; B-2, 1971; and 1:50,000 C-1, 1971.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Schlumberger CS3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Superpuma helicopter at a mean terrain clearance of 200 feet along N-S (or) 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-G2L 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 5) spheroid, 1927 North American datum using a central meridian (CM) of 153° 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.

900 HZ COPLANAR APPARENT RESISTIVITY OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

RESISTIVITY

The DIGHEM[®] EM system measured inphase and quadrature components of the frequencies. Two vertical coplanar coil-pairs operated at 1000 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 900 Hz using the Alumbaugh (1970) technique. All grids were then resampled from the 80 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

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

LOCATION INDEX

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 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program. All data and maps produced to date from this survey are available in digital format as DTD for a nominal fee through DGGG, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGG website (www.dggg.dnr.state.ak.us/gpubs). Maps are also available on paper through the DGGG office, and are viewable online at the website in Adobe Acrobat PDF file format.

Base from U.S. Geological Survey Bulletin A-1, 1970; B-1, 1970; Tanana A-6, 1960; B-6, 1970; Gooding, Alaska.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Scintrex G33 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AG-350C-83 Sabreliner helicopter at a mean terrain clearance of 200 feet along N-S (Z) survey flight lines with a spacing of a quarter of a mile. The flight lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L 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 1 cm. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 American datum using a central meridian (CM) of 153° 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.

900 HZ COPLANAR APPARENT RESISTIVITY OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

RESISTIVITY

The DIGHEM[®] EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1000 and 5500 Hz while three horizontal coplanar coil-pairs operated at 800, 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. All grids were then resampled from the 80 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

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.

LOCATION INDEX

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 (DGGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys Corp. in 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGGS, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGGS website (www.dgggs.dnr.state.ak.us/pub/). Maps are also available in paper through the DGGGS office and are viewable online at the website in Adobe Acrobat PDF file format.

Derives outlines from U.S. Geological Survey foliation, A-1, 1972, A-2, 1972, B-1, 1976, B-2, 1987. Digitized from USGS.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Schlumberger CS3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (or) 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-G2L 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 5) spheroid, 1927 North American datum using a central meridian (CM) of 153° 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.

900 Hz COPLANAR APPARENT RESISTIVITY OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PARTS OF MELOZITNA AND TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

RESISTIVITY

The DIGHEM[®] EM system measured inphase and quadrature components at the frequencies. Two vertical coil-pairs operated at 1000 and 5500 Hz while three horizontal coplanar coil-pairs operated at 800, 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. All grids were then resampled from the 80 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

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.

RESISTIVITY CONTOURS

LOCATION INDEX

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 (DGGSS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys Corp. in 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program. All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGSS, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGSS website (www.dggss.dnr.state.ak.us/pubs). Maps are also available on paper through the DGGSS office, and are viewable online at the website in Adobe Acrobat PDF file format.

The geophysical data were acquired with a DIGHEMY Electromagnetic (EM) system, Radiation Solutions Corporation, which consists of a dual channel EM-601 D1344 magnetometer with a Scintrex CS3 cesium sensor, mounted on a light aircraft. The flight altitude of the spectrometer was flown at a height of 200 feet. Data were collected along parallel flight lines spaced 200 feet apart. Positioning was done using differential GPS, laser altimeters, GPS navigation system, and a real time kinematic (RTK) receiver. The flights were performed with an AS-350-B3 Squirrel II helicopter. The RTK receiver was mounted on the tail boom 200 feet above N-S (0°) survey flight lines. The RTK receiver was used to determine the location of the flight lines and quarter section corner locations. The flight lines were flown perpendicular to the flight lines at intervals of approximately 1 mile.

A Novatel OEM4-G2L Global Positioning System (GPS) was used to provide precise position profiles. This device every 0.5 seconds using post-flight processing can achieve horizontal accuracy better than 5m. Flight path positions were determined by averaging the GPS readings over a sphere, 1927 North American datum using a WGS84 datum. The vertical accuracy is about 0.4 m and an east constant of 500,000. Positional accuracy of the presented data is better than 1 meter.

PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

The DIGHEM[®] EM system measured inphase and quadrature components at 100 frequencies. Two vertical copoll coils—pair 1 operated at 900 and 1500 Hz with three horizontal copoll coils—pairs operated at 900, 7200 and 56,000 Hz. EM data were sampled at 0.1 sec intervals. Electromagnetic fields were induced in conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the copollar 900 Hz using the partial induction equation. The data were then interpolated onto a regular 80 m grid using a modified Alamo (1970) technique. All grids were then resampled from the 80 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

Alima, 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 and Geophysical Surveys (DGGS) and Steven J. Expiration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys Corp. In 2009 and 2010, The project was funded by the Alaska State Legislature as part of the Alaska Geological & Geophysical Mineral Inventory Program.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee of \$25.00. The DVD contains the following information: 99709-3707, and are downloadable for free from the DGGS website (www.dggs.dr.state.ak.us/pub/). Maps are also available on paper through the DGGS office, and are available online at the website in Adobe Acrobat PDF file format.

TOTAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PART OF MELOZITNA B-2 QUADRANGLE

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIDEMV Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Scintrex CSI cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an Air-3000-3333 Survey helicopter at a mean terrain clearance of 200 feet. N-S (or) 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-G2L 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 1 meter. The data were projected onto the Clarke 1886 (UTM zone 5) projection, 1927 North American datum. 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 DIDEMV EM system measured in-phase and quadrature components at five frequencies. Two vertical coil-coupled poles operated at 1000 and 5000 Hz while three horizontal coil-coupled poles operated at 200, 7200, and 50,000 Hz. EM data were recorded at 0.1 second intervals. The EM system responds to bedrock conductivity, 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 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 magnetometer with a Scintrex CSI 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) IGRF corrected (IGRF model 2008, updated for date of flight and altimeter variations), (3) leveled to the tie line data, and (4) interpolated onto a regular 80 m grid using a modified Akima (1970) technique. All grids were then resampled from the 80 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

Alaska, N. 1927 North American datum of the location of Geophysical coordinates: N 17, W 1, E 58-50-00.

LOCATION INDEX FOR 1:31,680

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 area were acquired and processed by Fugro Airborne Surveys Corp. In 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program. All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGS, 3354 College Road, Fairbanks, Alaska, 99708-3702, and are downloadable for free from the DGGS website (www.dggs.alaska.gov). Maps are also available on paper through the DGGS office, and are viewable online at the website in Adobe Acrobat PDF file format.

Base from U.S. Geological Survey Bulletin B-1-1978, Geologic Map of Alaska

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHM Electromagnetic (EM) system, Radiation Solutions RS-300 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Scintrex C33 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. The gamma-ray spectrometer and the EM system were flown on a 20/60 Hz monitor and video camera. Flights were performed with an AS-350-B3 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 OEM4-02L Global Positioning System was used for navigation. A relative accuracy of better than 5m. Flight path positions were projected onto the Clarke 1882 UTM zone 50, sphere, 1927 North American datum using a central meridian (CM) of 133° 30' west constant. The mean terrain clearance was 200 feet. Positional accuracy of the presented data is better than 10m with respect to the UTM grid.

ELECTROMAGNETIC ANOMALIES

TOTAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PART OF MELOZITNA B-1 QUADRANGLE

by
Lauri E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

TOTAL MAGNETIC FIELD

The magnetic total field data were processed using digitally recorded data from a Fugro D1344 magnetometer with a Scintrex C33 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) corrected for magnetic declination, (3) corrected for magnetic declination, and (4) interpolated onto a regular 80 m grid using a modified Akima (1970) technique. All grids were then resampled from the 80 m cell size down to a 25 m cell size to provide the maps and final grids contained in this publication.

Alaska, 1970. A new method of interpolation and cross-checking based on line projections. *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 (2005), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys Corp. in 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Survey History Program.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through 2025. 3504 College Road, Fairbanks, Alaska, 99709-7107, and are available for free from the DGG website (www.dgg.alaska.gov). Maps are also available on CD-ROM through the DGG website and are viewable online at the website in Adobe Acrobat PDF file format.

LOCATION INDEX FOR 1:51,680

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

SURVEY HISTORY

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological and Geophysical Surveys (DGGS) and Stevens Exploration Management Corporation. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys Corp. in 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Fugro Airborne Geological & Geophysical Mineral Inventory Program.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee of \$250.00. The DVD includes the following: Alaska 99709-3707, and are downloadable for free from the DGGS website (www.dggs.alaska.gov). Maps are also available on paper through the DGGS office, and are available online at the website in Adobe Acrobat (.PDF) format.

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.

ELECTROMAGNETIC ANOMALIES

	Anomaly	Conductance
	●	>100 stemmings
	○	50-100 stemmings
	◐	20-50 stemmings
	◑	10-20 stemmings
	○	<10 stemmings
	○	1-5 stemmings
	○	<1 stemming
	⊗	EM magnetite response
	△	Cultural
Interpretive symbol	Conductor model	
Anomaly	B	Bedrock conductor
D	N	Name bedrock conductor "thin dikes"
S	C	Conductive zone ("fossilized thin sheet")
H	B	Banded conductors (e.g., shale, dense conductive weathering, thin magnetic zones, "half-moons")
Interpretive symbol	E	Edge of breast conductor (edge of half space)
L	M	Contact area, part of conductor (metal building or fence)
M		Magnetite
Y		Indicates some uncertainty as to the most appropriate EM source mode, but does not question the validity of the interpretation.

Interpretive symbol	Conductor model
B	Bedrock conductor
D	Narrow bedrock conductor (“thin dike”)
S	Conductive cover (“horizontal ice sheet”)
H	Broad conductive rock unit deep conductive weathering thick conductive cover (“half-space”)
E	Edge of broad conductor (“edge of half space”)
L	Culture, e.g. power line, metal building or fence
M	Magnetite
??	Indicates some uncertainty the most appropriate EM model, but does not question the data

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEMY Electromagnetic (EM) system, Radiation Solutions (RS) Gamma-Ray Scintillation Counter (GRSC) and a D1344 magnetometer with a Sclntrex CS3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition, the data were collected using a Global Positioning System (GPS), a real-time kinematic (RTK) and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S 10° survey flight lines with a spacing of one quarter of a mile. The flight lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L 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 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 1000000 and a scale factor of 0.999993. The accuracy of the presented data is better than 10m with respect to the UTM grid.

The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system, Radiation Solutions International, Inc. (RSI), consisting of a ground conductivity probe with a Sintercon CS-2000 magnetometer. The EM and magnetic sensors were towed by a motorboat at a depth of 10 m. The spectrometer was flown at a height of 200 feet. The data were collected using a 1000-Hz frequency and laser altimeters, GPS navigation system, and a 1000-Hz frequency. The data were collected and processed with RSIG-350-B3 Squares and RSIG-350-B3 Squares. The data were collected along N-S (0°) survey flight lines with a spacing of a quarter of a mile. The data were collected along N-S (0°) survey flight lines at intervals of approximately 3 miles.

A Novatel OEM4-02L Global Positioning System (GPS) receiver was used to collect the data. The receiver was delivered every 0.5 seconds using post-flight processing. The data were collected with a precision of better than 5 m. Flight path positions were determined using a GPS receiver. The data were collected using a 1000-Hz frequency and laser altimeters, GPS navigation system, and a 1000-Hz frequency. The data were collected along N-S (0°) survey flight lines with a spacing of a quarter of a mile. The data were collected along N-S (0°) survey flight lines at intervals of approximately 3 miles.

A Novatel OEM4-02L Global Positioning System (GPS) receiver was used to collect the data. The receiver was delivered every 0.5 seconds using post-flight processing. The data were collected with a precision of better than 5 m. Flight path positions were determined using a GPS receiver. The data were collected using a 1000-Hz frequency and laser altimeters, GPS navigation system, and a 1000-Hz frequency. The data were collected along N-S (0°) survey flight lines with a spacing of a quarter of a mile. The data were collected along N-S (0°) survey flight lines at intervals of approximately 3 miles.

PARTS of MELOZITNA A-2 and B-2 QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

ELECTROMAGNETIC ANOMALIES

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ELECTROMAGNETICS

To determine the location of EM anomalies or their boundaries, the EM system measured S-wave and quadrature components at five frequencies. Two vertical coaxial-coil pairs operated at 1000 and 5500 Hz while three horizontal coplanar-coil pairs operated at 900, 7200, and 5500 Hz. The EM system was designed to operate in 10-min 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 letter code assigned to the anomaly. The method of determination of the type of conductor is based on EM anomaly shapes of the coaxial- and coplanar-coil responses, together with conductor and magnetic patterns and topography. The position of the aircraft flight track record views were examined to locate cultural sources.

TOTAL MAGNETIC FIELD

The magnetic total field data were processed using digitally recorded data from a Fugro D1344 magnetometer with a Siemens C-6000 computer. The data were collected at sampling intervals of 0.1 seconds. The magnetic data were (1) corrected for diurnal variations by subtraction of the digitally recorded base station magnetic data, (2) IGRF corrected (IGRF model data, 2005, updated for date of flight and declination variations), (3) leveled to the tie line data, and (4) interpolated onto a regular 80 m grid using a modified Aldra (1970) technique. All grids were then resampled from the 80 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

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 area were acquired in 1997 and 1998, and the map was completed in 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program.

All data and maps produced to date from this survey are available on DVD for a nominal fee, or can be downloaded through DGGs, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGs website (www.dggs.alaska.gov). Maps are also available on paper through the DGGs office, and are available online at the website in Adobe Acrobat (.PDF) file format.

TOTAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PARTS OF TANANA A-6 AND B-4 QUADRANGLES

Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

ELECTROMAGNETIC ANOMALIES

Conductance

- >100 Siemens
- 50-100 Siemens
- 30-50 Siemens
- 10-30 Siemens
- 5-10 Siemens
- 1-5 Siemens
- < 1 Siemens
- Indeterminate
- EM magnetic response
- Culture

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Solitex CSI cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition, the survey recorded data from radar and laser altimeters. GPS navigation system, 50/60 Hz monitors and video camera flights were performed with an AS-300-B3 Super helicopter at a mean terrain clearance of 200 feet along 1-2 (2) survey legs 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-G2L 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 10 meters. The position data were projected onto the Clarke 1886 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, 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.

ELECTROMAGNETICS

To determine the location of EM anomalies or their boundaries, the DIGHEM EM system measured dipole and quadrature components at five frequencies. Two vertical coiled-coil poles operated at 1000 and 5000 Hz while three horizontal coplanar-coil poles operated at 200, 7200, and 50,000 Hz. EM data were recorded at 0.1 second conductive overburden, and cultural sources. The type of conductor is interpreted based on EM anomaly shapes of the coiled-coil 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 data were processed using digitally recorded data from a Fugro D1344 magnetometer with a Solitex CSI 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) IGRF corrected (IGRF model 2005, updated for date of flight and altimeter variations), (3) leveled to the line data, and (4) interpolated onto a regular 80 m grid using a modified Alamo (1970) technique. All grids were then resampled from the 80 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

Altitude, 1985, is a sea level of interpolation and smooth curve of geopotential height, not a mean sea level.

LOCATION INDEX FOR 1:51,680

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Survey (DGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys Corp. in 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGS, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGS website (www.dggs.alaska.gov). Maps are also available on paper through the DGGS office, and are viewable online at the website in Adobe Acrobat PDF file format.

Base from U.S. Geological Survey 1:50,000 A-1, 1971; A-2, 1972; B-1, 1971; B-2, 1971; and 1:50,000, 1971.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Schlumberger CS3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a helicopter altitude of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (or S-N) 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-G2L 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 5) spheroid, 1927 North American datum using a central meridian (CM) of 153° 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.

THORIUM (Th) OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1860–1860 keV), potassium (1370–1570 keV), total radioactivity (400–2815 keV) and cosmic radiation (2000–2400 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in MGS Report 323. After removal of the background, the data were corrected for spectral interference, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1981; Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

LOCATION INDEX

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 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program. All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGG, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGG website (www.dggg.alaska.gov/pubs). Maps are also available on paper through the DGGG office, and are viewable online at the website in Adobe Acrobat PDF file format.

Base from U.S. Geological Survey Bulletin A-1, 1970; B-1, 1970; Tanana A-6, 1960; B-6, 1970; Goodwin, Alaska.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[®] Earthmagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Scintrex G33 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition, the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (or) 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-G2L 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 cm. Flight path coordinates were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153° a north constant of 0 and an east constant of 500,000. Horizontal accuracy of the presented data is better than 10 m with respect to the UTM grid.

THORIUM (eTh) OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PARTS OF MELOZITNA and TANANA QUADRANGLES

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

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in the windows corresponding to thorium (2410–2810 keV), uranium (1660–1860 keV), potassium (1370–1570 keV), total radioactivity (400–2815 keV) and cosmic radiation (2000–>5000 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in WGS Report 323. After removal of the background, the data were corrected for spectral interferences: changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

LOCATION INDEX

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 (DGGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys Corp. in 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGGS, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGGS website (www.dggs.dnr.state.ak.us/pub/). Maps are also available on paper through the DGGGS office and are viewable online at the website in Adobe Acrobat PDF file format.

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

[illegible]

The gamma-ray spectrometry data were recorded at 0.2 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of NaI(Tl) crystals, a 1000-channel MCA, and a 1000-channel of upward looking (radon) detector. After application of Noise Added Singular Value Decomposition to the spectra, counts from thorium (2140–2810 keV), uranium (1660–1860 keV), potassium (1370–1570 keV), total radioactivity (400–2815 keV) and cosmic radiation (3000–8000 keV). Counts from the radon detector were subtracted from the thorium and uranium spectra. The entire system was calibrated following the methods outlined in IEA Report 323. After removal of the background, the data were corrected for self-attenuation and geometry. The data were then converted to reports from the planned survey elevation of 200 feet. The data were then converted to standard concentration units and the concentration of radon was 100 mCi/L. The data were then converted to standard concentration units. All grids were then resampled from the 100 m cell size down to a 10 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying. Technical Report 323, International Atomic Energy Agency, Vienna.

..... 20.0 ppm
..... 5.0 ppm
..... 1.0 ppm

This map has been compiled and drawn under contract between the State Department of Natural Resources, Division of Geological & Geophysical Surveys (DGG&S), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired during the 1970s and 1980s, and were digitized in 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program.

All data and maps produced to date from this survey are available online at www.dgg&s.state.ak.us/pubs for a nominal fee, through DGG&S, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGG&S website (www.dgg&s.state.ak.us/pubs). Maps are also available on paper through the DGG&S office, and are available online at the website in Adobe Acrobat .PDF file format.

Section of the map showing the location of the survey area within the state of Alaska.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEMV Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D134 magnetometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AD-350-23 Sabreliner helicopter at a mean terrain clearance of 200 feet along N-S (Z) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L 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 1 cm. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) central meridian (CM) of 153° north constant of 0 and east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410-2810 keV), uranium (1660-1860 keV), potassium (1370-1570 keV), total radioactivity (400-2815 keV) and cosmic radiation (2000-6000 keV). Counts from the radon detector were recorded in the radon window (1660-1860 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323.

After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991. Airborne Gamma Ray Spectrometer Surveying. Technical Report 323, International Atomic Energy Agency, Vienna.

THORIUM (eTh) OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

CONTOUR INTERVAL
..... 20.0 ppm
..... 5.0 ppm
..... 1.0 ppm

LOCATION INDEX

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 (DGGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys Corp. in 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGGS, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGGS website (www.dggs.dnr.state.ak.us/pub/). Maps are also available on paper through the DGGGS office and are viewable online at the website in Adobe Acrobat PDF file format.

The geophysical data were acquired with a DIGHWY Electromagnetic (EM) system, Radiation Solutions Inc., model EM-600, which consists of a dual-coil D1544 magnetometer with a Schlumberger CS5 cesium sensor, mounted on a height of 10 m above the ground. The spectrometer was flown at a height of 200 feet, with a flight speed of 10 m/sec. Data were collected by two laser altimeters, GPS navigation system, and a real-time differential GPS receiver. The flights were performed on an AS-350-B3 helicopter. The survey track consisted of parallel flight lines 200 feet along N-S (0°) square flight lines with a spacing of a quarter of a mile. The flight lines were spaced at intervals of approximately 3 miles.

A Novatel OEM4-G2L Global Positioning System (GPS) receiver was used to provide precise timing. It was derived every 0.5 seconds using post-flight processing. The accuracy of the GPS position was better than 1 cm. Flight path positions were determined from a series of ground control points (GCPs), spheroid, 1927 North American datum using a central meridian (0°) of 153° , a north constant of 6300000 m, and a scale factor of 0.9996 . The accuracy of the presented data is better than ± 1 m.

PARTS OF MELOZITNA and TANANA QUADRANGLES

RADIOMETRICS

RADIOMETRICS

The gamma-ray spectrum data were recorded at 1.0 second sample rate using a Canberra Model 5005-P50-GSM gamma-ray spectrometer. It was configured with 16.8Li (204 cubic inches of mass) (downward) NaI crystal detector, and 4.2L (256 cubic inches) of mass) (upward) NaI crystal detector. The detector was calibrated using Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to the following energy ranges: 100–1300 keV (background), 1370–1570 keV, total radioactivity (400–2815 keV) and cosmic radiation (3000–3600 keV). Counts from the radon detector were recorded in two windows corresponding to the following energy ranges: 200–260 keV and 260–320 keV. The detector system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for self-attenuation and geometry. The data were then corrected for departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were then used to produce the maps and final grids contained in this publication.

This map has been compiled and drawn under contract between the State Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Stevens Exploration Management Corp. in 1997 and 1998. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee. The data are available in the following formats: Alaska 99709-3707, and are downloadable for free from the DGGS website (www.dggs.dnr.state.ak.us/pubs). Maps are also available on paper through the DGGS office, and are available online at the website in Adobe Acrobat, .PDF file format.

Base from U.S. Geological Survey Bulletin A-1, 1970; B-1, 1970; Tanana A-6, 1960; B-6, 1970; Goodwin, Alaska.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Scintrex G33 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350B3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (2°) 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-G2L 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 1 cm. Flight path coordinates were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153° north constant of 0 and east constant of 500,000. Horizontal accuracy of the presented data is better than 10 m with respect to the UTM grid.

URANIUM (eU) OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PARTS OF MELOZITNA and TANANA QUADRANGLES

by

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

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in the windows corresponding to thorium (2410–2810 keV), uranium (1660–1860 keV), potassium (1370–1570 keV), total radioactivity (400–2815 keV) and cosmic radiation (2000–>6000 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in WGS Report 323. After removal of the background, the data were corrected for spectral interference changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

LOCATION INDEX

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 (DGGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys Corp. in 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program. All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGGS, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGGS website (www.dggs.dnr.state.ak.us/pub/). Maps are also available on paper through the DGGGS office and are viewable online at the website in Adobe Acrobat PDF file format.

[illegible]

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

RADIOMETRICS

The gamma-ray spectrometry data were recorded at 1.0 second sample rate using a RDS-5000 RDS-5000 GM-5000 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of main (upward) NaI crystal detector. The detector was configured with Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to 1730–1750 keV, total radioactivity (400–2815 keV) and cosmic radiation (3000–3600 keV). Counts from the radon detector were recorded in five windows corresponding to 200–260 keV. The system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for decay and then converted to standard concentration units which were then converted to standard concentration units which were then converted to standard concentration units which were then converted to standard concentration units. All grids were then resampled from the 100 m cell size down to a 10 m cell size to produce the maps and find grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

CONTOUR INTERVAL

..... 20.0 ppm

..... 4.0 ppm

..... 0.5 ppm

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geophysical Surveys (DGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys Corp. In 2009 the 2008 Alaska State Fair Act authorized the State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee. The data are available in a number of formats: 1) 99709-3707, and are downloadable for free from the DGS website (www.dgs.dnr.state.ak.us/pubs). Maps are also available on paper through the DGS office, and are available online at the website in Adobe Acrobat, .PDF file format.

Section Outline Map U.S. Geological Survey Bulletin A-1, 1971; B-1, 1974; Tanana A-6, 1966; B-6, 1972; Gadsden, Alaska

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEMV Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition, the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-2B3 Seahawk helicopter at a mean terrain clearance of 200 feet along N-S (Z) survey flight lines with a spacing of a quarter of a mile. The flight lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L 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 1 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) central meridian (CM) of 153° 0' north constant of 0 and east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS
The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410-2810 keV), uranium (1660-1860 keV), potassium (1370-1570 keV), total radioactivity (400-2815 keV) and cosmic radiation (2000-6000 keV). Counts from the radon detector were recorded in the radon window (1660-1860 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

URANIUM (eU) OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

CONTOUR INTERVAL
..... 20.0 ppm
..... 4.0 ppm
..... 0.5 ppm

LOCATION INDEX

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 area were acquired and processed by Fugro Airborne Surveys Corp. in 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program. All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGS, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGS website (www.dggs.dnr.state.ak.us/pub/). Maps are also available on paper through the DGGS office and are viewable online at the website in Adobe Acrobat PDF file format.

Base Data: U.S. Geological Survey, 1:50,000, A-1, 1971; A-2, 1972; B-1, 1971; B-2, 1971; Quadrangle, Alaska.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Schlumberger CS3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Super helicopter at a mean terrain clearance of 200 feet along N-S (or S-N) 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-G2L 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 5) spheroid, 1927 North American datum using a central meridian (CM) of 153° 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.

POTASSIUM (K%) OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1860 keV), potassium (1370–1570 keV), total radioactivity (400–2815 keV) and cosmic radiation (2000–24000 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in MGS Report 323. After removal of the background, the data were corrected for spectral interference, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1981; Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

LOCATION INDEX

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 (DGGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys Corp. in 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program. All data and maps produced to date from this survey are available in digital format as DTD for a nominal fee through DGGGS, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGGS website (www.dgggs.dnr.state.ak.us/pubs). Maps are also available on paper through the DGGGS office, and are viewable online at the website in Adobe Acrobat PDF file format.

The geophysical data were acquired with a DIGHEM Electromagnetic (EM) system; Radiation Solutions Inc. The EM system consists of a Sintered Magnetics D1344 magnetometer with a Sintered CS3 cesium sensor. The magnetic sensors were mounted on a spectrometer was flown at a height of 200 feet, with a ground speed of about 100 m/sec. Data collection and laser altimeters, GPS navigation system, and real-time processing software were controlled by a PC were performed with an AS-350-B3 Squairrel. The flight track followed a series of parallel tracks spaced 200 feet along N-S (0°) survey flight lines with a spacing of quadrilaterals between the flight lines at intervals perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-C2L Global Positioning System (GPS) receiver was used to provide precise timing. It was derived every 0.5 seconds using post-flight processing. The accuracy of the GPS position was better than 5m. Flight path positions were determined from the GPS data using a datum of WGS84 spheroid, 1927 North American datum using a datum shift of 6.5m. The horizontal accuracy of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 5m.

PARTS OF MELOZITNA and TANANA QUADRANGLES

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

RADIOMETRICS

RADIOMETRICS

The gamma-ray spectrum was recorded at 10 second sample rate using a NaI(RS) Sodium Iodide RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of NaI crystal. The detector was mounted vertically, 1 m above the ground surface looking upward looking (radon detection). After application of Noise Added Singular value Decomposition to the spectra, counts from Thorium (2410–2810 keV), uranium (1660–1860 keV), potassium (1370–1470 keV) were integrated. Radon concentration was determined by radon decay (3000–26000 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection limit was approximately 10 dpm/l. The background level was subtracted after removal of the background, the data were corrected for atmospheric absorption and converted to standard concentration units which were then converted to standard concentration units which were then converted to standard concentration units.

All grids were then resampled from the 100 m cell size down to a 10 m grid. This was done to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991. Airborne Gamma Ray Spectrometry for Environmental Monitoring. Vienna: International Atomic Energy Agency.

LOCATION INDEX

SURVEY HISTORY

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological and Geophysical Surveys (DGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys Corp. In 2009 the State of Alaska transferred the title of the Airborne Geophysical Survey to the State of Alaska Department of Natural Resources as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee of \$100.00. The DVD contains the following files: 1) DGGS 99709-3707, and are downloadable for free from the DGGS website (www.dggs.dnr.state.ak.us/pubs/). Maps are also available on paper through the DGGS office, and are viewable online at the website in Adobe Acrobat .PDF file format.

Derives information from U.S. Geological Survey Bulletin A-1, 1972, A-2, 1972, B-1, 1976, B-2, 1977, and 1978.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Sinter CS3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (or) 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-G2L 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 5) spheroid, 1927 North American datum using a central meridian (CM) of 153° 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.

POTASSIUM (K%) OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410-2810 keV), uranium (1660-1860 keV), potassium (1370-1570 keV), total radioactivity (400-2815 keV) and cosmic radiation (3000-34000 keV). Counts from the radon detector were recorded in the radon window (1660-1860 keV). The radon detection system was calibrated following methods outlined in ICA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

CONTOUR INTERVAL

.....	2.50 %
.....	0.50 %
.....	0.10 %

LOCATION INDEX

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 (DGGSS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys Corp. in 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program. All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGSS, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGSS website (www.dggs.dnr.state.ak.us/gpubs). Maps are also available on paper through the DGGSS office, and are viewable online at the website in Adobe Acrobat .pdf file format.

RADIONUCLIDES

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of NaI(Tl) crystal, 1000 channels, and a 1000 channel mode of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the radon peak were subtracted from the spectra. The radon peak was at 214Pb (240–280 keV), uranium (1660–1860 keV), potassium (1370–1570 keV), total radioactivity (400–2815 keV) and cosmic background (100–1000 keV). The radon peak was not recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in IEA Report 323. The data were corrected for background, dead time, and other spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to a 100 m cell size, the radon data were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 10 m cell size. The data were then used to produce the maps and final grids contained in this publication.

RADIOMETRICS

RADIOMETRICS

The grain radii spectra were recorded at a 1.0 second sample rate using a RADIOSPECIES RS-500 gamma-ray spectrometer. It was configured with 16.8Li (104 cm³ inches) of NaI(Tl) crystals. The detector was mounted 10 cm above the upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the radon peak were subtracted. The spectra were for thorium (2410–2810 keV), uranium (1660–1860 keV), potassium (1460–1480 keV) and cesium (660–680 keV). The gamma-ray radiation (3000–26000 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detector was used to monitor the radon concentration in the water. After removal of the background, the data were corrected for the decay of the radon gas. The data were then corrected for the departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were plotted on a log scale from 100 to 1000000. The data were then plotted on a log scale from 100 to 1000000. The data were then plotted on a log scale from 100 to 1000000. All grids were then resampled from the 100 m cell size down to a 10 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991. Airborne Gamma Ray Spectrometry in Environmental Monitoring. IAEA-TECDOC-542. Vienna, Austria.

PARTS OF MELOZITNA and TANANA QUADRANGLES
by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

**POTASSIUM (K%)
OF THE MORAN SURVEY AREA,
SOUTH-CENTRAL MELOZITNA MINING DISTRICT,
CENTRAL ALASKA**

PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Corp., a
2010

CONTOUR INTERVAL

_____		2.50 %
_____		0.50 %
_____		0.10 %

SURVEY HISTORY

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological and Geophysical Surveys (DGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys Corp. In 2009 the State of Alaska transferred the Alaska Geological and Geophysical Inventory Program to the Alaska Department of Natural Resources.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee. The DVD contains the following files: 1) DGGS file 99709-3707, and are downloadable for free from the DGGS website (www.dggs.dnr.state.ak.us/pub/). Maps are also available on paper through the DGGS office, and are viewable online at the website in Adobe Acrobat (.PDF) file format.

Base Data: U.S. Geological Survey, 1:50,000, A-1, 1972, A-2, 1972, B-1, 1972, B-2, 1972, Quadrangle, Alaska.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Scintrex C53 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (or) 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-G2L 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 5) spheroid, 1927 North American datum using a central meridian (CM) of 153° 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.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410-2810 keV), uranium (1660-1860 keV), potassium (1370-1570 keV), total radioactivity (400-2815 keV) and cosmic radiation (3000-34000 keV). Counts from the radon detector were recorded in the radon window (1660-1860 keV). The radon detection system was calibrated following methods outlined in ISA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

THORIUM / POTASSIUM (eTh/K) OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

LOCATION INDEX

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 (DGG), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys Corp. in 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program. All data and maps produced to date from this survey are available in digital format as DTD for a nominal fee through DGG, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGG website (www.dgg.dnr.state.ak.us/pubs). Maps are also available on paper through the DGG office, and are viewable online at the website in Adobe Acrobat .pdf file format.

THORIUM / POTASSIUM (eTh/K)
Measured radioelement concentrations for potassium and thorium will vary sympathetically with variations in soil thickness and moisture content. The ratio parameter isolates areas of enrichment of one radioelement relative to another. A blank region indicates an area where the summed concentrations fall below thresholds required for a meaningful calculation of the ratio. Extensive bodies of water attenuate the radiometric signal, resulting in very low counts on all parameters. No meaningful radioelement ratio calculations can be obtained in these areas, and as a result they have been masked based on the outline on the topographic maps.

The geophysical data were collected with DIOHEM Electromagnetic (EM) system, Radiation Solutions AS-500 gamma-ray spectrometer and a Fugro 3000 sensor. The EM and magnetic sensors were mounted on a 100-m-long towed vessel. The EM spectrometer was flown at a height of 200 feet, and the gamma-ray spectrometer was flown at 100 feet. The EM system also included a magnetometer and laser altimeter. GPS navigation system, which was used to track the vessel's position, was also performed with an AS-350-B3 Saurcil GPS receiver. The vessel was towed at a speed of 200 feet along N-S (0°) survey flight lines with a spacing of a quarter of a mile. The survey lines were spaced at 1000 feet, and the flight lines at intervals of approximately 30° or 33 miles.

A Novatel OEM4-D2L Global Positioning System was derived every 0.5 seconds using post-flight processing. The system provided a position accuracy better than 5m. Flight path positions were determined using a GPS receiver mounted on a spheroid, 1927 North American datum using a datum of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10m.

PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

RADIOMETRICS

RADIOMETRICS

The gamma-ray spectrometry data were recorded as a 1.0 second sample rate using a Radian RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) Na crystal detector, and 4.2L (256 cubic inches) of Na crystal detector. The detector was calibrated using an Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to the following energy ranges: (100–130 keV) ^{22}Na and ^{22}Ac (^{22}Na 1370–1570 keV), total radioactivity (400–2815 keV) and cosmic radiation (3000–6000 keV). Counts from the radon detector were recorded in the radon window (1680–1850 keV). The radon detector was used to monitor the radon concentration in the sample. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and geometry. The data were then converted to standard concentration units which were then converted to 100 g grid size and then to 100 cm grid size. All grids were then resampled from the 100 cm cell size down to a 25 cm cell size to prepare the maps and final grids contained in this report.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

THORIUM / POTASSIUM (eTh/K)

THORIUM / POTASSIUM (eTh/K)

Measured radiocement concentrations for potassium and thorium will vary sympathetically with variations in soil thickness and moisture content. The ratio parameter isolates areas of enrichment of one radiocement relative to another.

A blank region indicates an area where the summed concentrations fall below thresholds required for a meaningful calculation of the ratio.

Extensive bodies of water attenuate the radiometric signal, resulting in very low values for all parameters. No meaningful radiocement ratio calculations can be obtained in these areas, and as a result they have been masked based on the outline on the topographic maps.

SURVEY HISTORY

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological and Geophysical Surveys (DGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys Corp. In 2009 the 20th anniversary of the Alaska State of Alaska Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee of \$50.00. All maps are available in digital format for 99709-3707, and are downloadable for free from the DGGS website (www.dggs.dnr.state.ak.us/pub/). Maps are also available on paper through the DGGS office, and are available online at the website in Adobe Acrobat PDF file format.

The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system, Radiation Solutions Inc., 900 Gamma-ray spectrometer and a Fugro D134-1000 EM gamma-ray spectrometer and a Fugro sensor. The EM and magnetic sensors were mounted on a ship's hull. The gamma-ray spectrometer was flown at a height of 200 feet, while the EM sensor was flown at a height of 200 feet. The ship was equipped with a GPS navigation system, a laser altimeter, GPS navigation system, and a laser altimeter. The survey track was performed with an AS-350-B3 SeaRuler helicopter. The survey track was flown at a height of 200 feet along N-S (0°) survey flight lines with a spacing of a quarter of a mile. The survey track was flown at a height of 200 feet along N-S (0°) survey flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L Global Positioning System (GPS) receiver was used to collect position data. It was derived every 0.5 seconds using post-flight processing. The accuracy of the GPS data is better than 1 m. Flight path positions were determined by the GPS data. The survey track was performed with an AS-350-B3 SeaRuler helicopter. The survey track was flown at a height of 200 feet along N-S (0°) survey flight lines at intervals of approximately 3 miles.

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

RADIOMETRICS

The gamma-ray spectrometry data were recorded at 1.0 second sample rate using a RORTECH Model RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of NaI (downward) NaI crystal detector, and 4.2L (256 cubic inches) of NaI (upward) NaI crystal detector. The data were processed using Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to the following energy ranges: 100–1370 keV (background), 1370–1570 keV, total radioactivity (400–2815 keV) and cosmic radiation (3000–6000 keV). Counts from the radon detector were recorded in two windows corresponding to the following energy ranges: 200–2600 keV and 2600–6000 keV. The spectrometer system was calibrated following methods outlined in IEA Report 323. After removal of the background, the data were corrected for self-attenuation and geometry. The data were then corrected for departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were then converted to standard concentration units which were then converted to standard concentration units. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

THORIUM / POTASSIUM (eTh/K)

Measured radioelement concentrations for potassium and thorium will vary sympathetically with variations in soil thickness and moisture content. The ratio parameter isolates areas of enrichment of one radioelement relative to another.

A blank region indicates an area where the summed concentrations fall below thresholds required for a meaningful calculation of the ratio. Extensive bodies of water attenuate the radiometric signal, resulting in very low counts on all parameters. No meaningful radioelement ratio calculations can be obtained in these areas, and as a result they have been masked based on the outline on the topographic maps.

CONTOUR INTERVAL

CONTOUR	INTERVAL
=====	20.0 ppm/%
=====	5.0 ppm/%
=====	1.0 ppm/%

SURVEY HISTORY

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geophysical Surveys (DGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys Corp. In 2009 the 2008 Alaska State Fair Act authorized the State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee. The data are available in the following formats: 1) 99709-3707, and are downloadable for free from the DGS website (www.dgs.dnr.state.ak.us/pubs). Maps are also available on paper through the DGS office, and are available online at the website in Adobe Acrobat, .PDF file format.

Section Outline Map: U.S. Geological Survey Bulletin A-1, 1971; B-1, 1974; Tanana A-6, 1986; B-6, 1972; Gadsden, Alaska

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM V Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Scintrex C33 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Sabreliner helicopter at a mean terrain clearance of 200 feet along N-S (Z) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L 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 1 cm. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) datum, 1927 North American datum using a central meridian (CM) of 153° 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.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1860 keV), potassium (1370–1570 keV), total radioactivity (400–2815 keV) and cosmic radiation (2000–6000 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in USA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to storage using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991. Airborne Gamma Ray Spectrometer Surveying. Technical Report 323, International Atomic Energy Agency, Vienna.

SCALE 1:63,360

1 2 3 4 5 MILES

1 2 3 4 5 KILOMETERS

THORIUM / POTASSIUM (eTh/K) OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

THORIUM / POTASSIUM (eTh/K)

Measured radioelement concentrations for potassium and thorium will vary systematically with variations in soil thickness and moisture content. The ratio parameter isolates areas of enrichment of one radioelement relative to another.

A blank region indicates an area where the summed concentrations fall below thresholds required for a meaningful calculation of the ratio.

Extensive bodies of water attenuate the radiometric signal, resulting in very low counts on all parameters. No meaningful radioelement ratio calculations can be obtained in these areas, and as a result they have been masked based on the outline on the topographic maps.

CONTOUR INTERVAL

..... 20.0 ppm/K
..... 5.0 ppm/K
..... 1.0 ppm/K

LOCATION INDEX

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 area were acquired and processed by Fugro Airborne Surveys Corp. in 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGS, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGS website (www.dggs.dnr.state.ak.us/pub/). Maps are also available on paper through the DGGS office and are viewable online at the website in Adobe Acrobat PDF file format.

Base Data: U.S. Geological Survey, 1:50,000, A-1, 1971; A-2, 1972; B-1, 1971; B-2, 1971; Quadrangle, Alaska.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIHEM[®] Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Scintrex CS3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (or) 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-G2L 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 5) spheroid, 1927 North American datum using a central meridian (CM) of 153° 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.

URANIUM / POTASSIUM (eU/K) OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410-2810 keV), uranium (1660-1860 keV), potassium (1370-1570 keV), total radioactivity (400-2815 keV) and cosmic radiation (3000-34000 keV). Counts from the radon detector were recorded in the radon window (1660-1860 keV). The radon detection system was calibrated following methods outlined in AGA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

URANIUM / POTASSIUM (eU/K)

Measured radioelement concentrations for uranium and potassium will vary systematically with variations in soil thickness and moisture content. The ratio parameter isolates areas of enrichment of one radioelement relative to another. A blank region indicates an area where the summed concentrations fall below thresholds required for a meaningful calculation of the ratio. Extensive bodies of water attenuate the radiometric signal, resulting in very low counts on all parameters. No meaningful radioelement ratio calculations can be obtained in these areas, and as a result they have been masked based on the outline on the topographic maps.

LOCATION INDEX

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 area were acquired and processed by Fugro Airborne Surveys Corp. in 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program. All data and maps produced to date from this survey are available in digital format as DTD for a nominal fee through DGGs, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGs website (www.dgs.dnr.state.ak.us/gds/). Maps are also available on paper through the DGGs office, and are viewable online at the website in Adobe Acrobat PDF file format.

[illegible]

PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

RADIOMETRICS

RADIOMETRICS

The gamma-ray spectra were recorded at a 10 second sample rate using a RADIOSPEC RS-500 gamma-ray spectrometer. It was configured with 16.8Li (104 cubic inches) of lithium fluoride crystals and a 100 cm² NaI(Tl) crystal of upward looking (radon) detector. After application of Noise Adjusted Single Value Decomposition to the spectra, counts from the 214Pb (241–281 keV), uranium (1660–1860 keV), potassium (40K) (1460 keV) and thorium (208Tl) (2614 keV) were integrated. The radon detector was used in the 3000–26000 keV. Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detector was used in the 2600–2614 keV. The radon detector was used in the 2614–2614 keV. After removal of the background, the data were corrected for self-attenuation and geometry. The data were then converted to standard concentration units which were then converted to standard concentration units which were then converted to standard concentration units. All grids were then resampled from the 100 m cell size down to a 10 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991. Airborne Gamma-Ray Spectrometry for Environmental Assessment. IAEA Technical Reports Series No. 36. Vienna, Austria.

URANIUM / POTASSIUM (eU/K)

URANIUM / POTASSIUM (80/K)

Measured radioclement concentrations for uranium and potassium will vary sympathetically with variations in soil thickness and moisture content. The ratio parameter isolates areas of enrichment of one radioclement relative to another.

A blank region indicates an area where the summed concentrations fall below thresholds required for a meaningful calculation of the ratio.

Extensive bodies of water attenuate the radiometric signal, resulting in very low soil parameters. No meaningful radioclement ratio calculations can be obtained in these areas, and as a result they have been masked based on the outline on the topographic maps.

SURVEY HISTORY

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological and Geophysical Surveys (DGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys Corp. In 2009 the Alaska Department of Natural Resources and the Alaska Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee. The maps are available in PDF format for a nominal fee. 99709-3707, and are downloadable for free from the DGGS website (www.dggs.dnr.state.ak.us/pub/). Maps are also available on paper through the DGGS office, and are available online at the website in Adobe Acrobat PDF file format.

Derives outline from U.S. Geological Survey Section A-1, 1972, A-2, 1972, B-1, 1976, B-2, 1977, and 1978, and 1979.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Scintrex CS3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (or) 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-G2L 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 5) spheroid, 1927 North American datum using a central meridian (CM) of 153° 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.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Single Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410-2810 keV), uranium (1660-1860 keV), potassium (1370-1570 keV), total radioactivity (400-2815 keV) and cosmic radiation (3000-3400 keV). Counts from the radon detector were recorded in the radon window (1660-1860 keV). The radon detection system was calibrated following methods outlined in USA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

URANIUM / POTASSIUM (eU/K) OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PARTS OF MELOZITNA and TANANA QUADRANGLES
by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

URANIUM / POTASSIUM (eU/K)

Measured radioelement concentrations for uranium and potassium will vary systematically with variations in soil thickness and moisture content. The ratio parameter isolates areas of enrichment of one radioelement relative to another.

A blank region indicates an area where the summed concentrations fall below thresholds required for a meaningful calculation of the ratio. Extensive bodies of water attenuate the radiometric signal, resulting in very low counts on all parameters. No meaningful radioelement ratio calculations can be obtained in these areas, and as a result they have been masked based on the outline on the topographic maps.

CONTOUR INTERVAL

..... 10.0 ppm/%
..... 2.0 ppm/%
..... 0.5 ppm/%

LOCATION INDEX

SURVEY HISTORY

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Section Outline from U.S. Geological Survey Bulletin A-1, 1971; B-1, 1974; Tanana A-6, 1966; B-6, 1972; Gadsden, Alaska

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEMY Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D134 magnetometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-2B3 Sabreliner helicopter at a mean terrain clearance of 200 feet along N-S (Z) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L 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 1 cm. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) meridian (CM) of 153° 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.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to the radon window (1370-1570 keV), total radioactivity (400-2815 keV) and cosmic radiation (2000-6000 keV). Counts from the radon detector were recorded in the radon window (1660-1860 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991. Airborne Gamma Ray Spectrometer Surveying. Technical Report 323, International Atomic Energy Agency, Vienna.

URANIUM / POTASSIUM (eU/K)

Measured radioelement concentrations for uranium and potassium will vary sympathetically with variations in soil thickness and moisture content. The ratio parameter isolates areas of enrichment of one radioelement relative to another.

A blank region indicates an area where the summed concentrations fall below thresholds required for a meaningful calculation of the ratio.

Extensive bodies of water attenuate the radiometric signal, resulting in very low counts on all parameters. No meaningful radioelement ratio calculations can be obtained in these areas, and as a result they have been masked based on the outline on the topographic maps.

CONTOUR INTERVAL

..... 10.0 ppm/%
..... 2.0 ppm/%
..... 0.5 ppm/%

LOCATION INDEX

SURVEY HISTORY

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Base Data: U.S. Geological Survey, 1:50,000, A-1, 1972; A-2, 1972; B-1, 1972; B-2, 1972; Quadrangle, Alaska.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Scintrex CES3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (or) 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-G2L 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 5) spheroid, 1927 North American datum using a central meridian (CM) of 153° 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.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410-2810 keV), uranium (1660-1860 keV), potassium (1370-1570 keV), total radioactivity (400-2815 keV) and cosmic radiation (3000-34000 keV). Counts from the radon detector were recorded in the radon window (1660-1860 keV). The radon detection system was calibrated following methods outlined in AGA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

URANIUM / THORIUM (eU/eTh) OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

URANIUM / THORIUM (eU/eTh)

Measured radionuclide concentrations for uranium and thorium will vary sympathetically with variations in soil thickness and moisture content. The ratio parameter isolates areas of enrichment of one radionuclide relative to another. A blank region indicates an area where the summed concentrations fall below thresholds required for a meaningful calculation of the ratio. Extensive bodies of water attenuate the radiometric signal, resulting in very low counts on all parameters. No meaningful radionuclide ratio calculations can be obtained in these areas, and as a result they have been masked based on the outline on the topographic maps.

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Base from U.S. Geological Survey Bulletin A-1, 1970; B-1, 1970; Tanana A-6, 1960; B-6, 1970; Gooding, Alaska.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEMY Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Scintrex G33 vector sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition, the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Sabreliner helicopter at a mean terrain clearance of 200 feet along N-S (Z) 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.

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International Atomic Energy Agency, 1991. Airborne Gamma Ray Spectrometer Surveying. Technical Report 323, International Atomic Energy Agency, Vienna.

URANIUM / THORIUM (eU/eTh) OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

SCALE 1:63,360
0 1 2 3 4 5 MILES
0 1 2 3 4 5 KILOMETERS

LOCATION INDEX

SURVEY HISTORY

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URANIUM / THORIUM (eU/eTh)

Measured radioelement concentrations for uranium and thorium will vary systematically with variations in soil thickness and moisture content. The ratio parameter isolates areas of enrichment of one radioelement relative to another.

A blank region indicates an area where the summed concentrations fall below thresholds required for a meaningful calculation of the ratio.

Meaningful radioelement ratio calculations can be obtained in these areas, and as a result they have been masked based on the outline on the topographic maps.

Derives outline from U.S. Geological Survey Section A-1, 1972, A-2, 1972, B-1, 1976, B-2, 1977. Digitized from USGS.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Sinter CS3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (or) 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-G2L 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 5) spheroid, 1927 North American datum using a central meridian (CM) of 153° 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.

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International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

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CONTOUR INTERVAL

.....	2.50
.....	0.50
.....	0.10

LOCATION INDEX

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Section Outline from U.S. Geological Survey Bulletin A-1, 1971; B-1, 1974; Tanana A-6, 1966; B-6, 1972; Gadsden, Alaska

DESCRIPTIVE NOTES

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International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

SCALE 1:63,360

1 2 3 4 MILES

0 1 2 3 4 KILOMETERS

URANIUM / THORIUM (eU/eTh) OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

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CONTOUR INTERVAL

..... 2.50
..... 0.50
..... 0.10

LOCATION INDEX

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This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys Corp. in 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program.

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The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system, Radiation Solutions Inc., 900 Gamma-ray spectrometer and a Fugro D134-1000 EM gamma-ray spectrometer and a Fugro sensor. The EM and magnetic sensors were mounted on a ship's hull. The gamma-ray spectrometer was flown at a height of 200 feet, and the EM sensor was flown at a height of 200 feet. The ship was equipped with a GPS navigation system, a laser altimeter, GPS navigation system, and a laser altimeter. The survey track was performed with an AS-350-B3 SeaRuler helicopter. The flight track was flown at a height of 200 feet along N-S (0°) survey flight lines with a spacing of a quarter of a mile. The flight lines were spaced at intervals of approximately 3 miles.

A Novatel OEM4-G2L Global Positioning System (GPS) receiver was used to collect position data. It was derived every 0.5 seconds using post-flight processing. The accuracy of the GPS data is better than 1 m. Flight path positions were determined by the GPS data. The GPS data were processed using the Novatel software package, Novatel Apheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 6371 km, and a scale factor of 1.0. The accuracy of the presented data is better than 1 m.

PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

RADIOMETRICS

RADIOMETRICS

The gamma-ray spectrum data were recorded at 1.0 second sample rate using a Canberra Model 3500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of NaI (downward) NaI crystal detector, and 4.2L (256 cubic inches) of NaI (upward) NaI crystal detector. The detector was Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to the following energy ranges: 1300–1370 keV (radon), 1370–1570 keV (radon), 1570–1750 keV (radon), 1750–2000 keV (radon), 2000–3000 keV (radon). Counts from the radon detector were corrected for decay and background. The detector system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for geometry and self-absorption. The data were then converted to standard concentration units which were then converted to standard concentration units which were then converted to standard concentration units. All grids were then resampled from the 100 m cell size down to 10 m cell size to produce the maps and final grids contained in this publication.

NATURAL AIR ABSORBED DOSE RATE

Raw counts have been converted to radioelement concentrations, and combined to produce natural air-absorbed dose rate, so that the results are independent of crystal volume and planned survey height. This facilitates comparisons to other surveys and ground data. Measurements are nanograys per hour (nGy/h).

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geophysical Surveys (DGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys Corp. In 2009 the 20th anniversary of the Fairbanks State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee. All data and maps are available in Fairbanks Alaska 99709-3707, and are downloadable for free from the DGS website (www.dgs.dnr.state.ak.us/pubs). Maps are also available on paper through the DGS office, and are available online at the website in Adobe Acrobat, .PDF file format.

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PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

RADIOMETRICS

The gamma-ray spectra were recorded at a 10 second sample rate using a RADIOSPEC RS-500 gamma-ray spectrometer. It was configured with 16.8Li (104 cm³ inches) of NaI(Tl) crystals. The detector was mounted vertically above the upward looking (radon) detector. After application of Noise Adjusted Single Value Decomposition to the spectra counts from thorium (240–280 keV), uranium (1660–1860 keV), potassium (40K) (1460 keV) and radon (214Pb) (2039 keV) peaks, the radiation (3000–26000 kcps). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated by means of a standard radon source.

After removal of the background, the data were corrected for self-absorption and geometry effects. Corrections for radon gas departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were expressed as dpm/l or Bq/l. The data were then averaged over 100 m grid squares.

All grids were then resampled from the 100 m cell size down to a 10 m cell size to produce maps and final grids contained in this publication.

International Atomic Energy Agency, 1991. Airborne Gamma Ray Spectrometry in Environmental Monitoring. IAEA Technical Reports Series No. 37, Vienna, Austria.

Raw counts have been converted to radioelement concentrations, and combined to produce natural air-absorbed dose rate, so that the results are independent of crystal volume and planned survey height. This facilitates comparisons to other surveys and ground data. Measurements are nanograys per hour (nGy/h).

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological and Geophysical Surveys (DGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys Corp. In 2009 the State of Alaska transferred the Alaska Geological and Geophysical Inventory Program to the Alaska Department of Natural Resources.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee. The DVD contains the following files: 1) DGGS file 99709-3707, and are downloadable for free from the DGGS website (www.dggs.dnr.state.ak.us/pub/). Maps are also available on paper through the DGGS office, and are viewable online at the website in Adobe Acrobat (.PDF) file format.

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PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

RADIOMETRICS

The gamma-ray spectrometry data were recorded at 1.0 second sample rate using a RDS-5000 RDS-5000 GM-5000 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of main (upward) NaI crystal detector. The detector was configured with Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to 1700–1750 keV, total radioactivity (400–2815 keV) and cosmic radiation (3000–3600 keV). Counts from the radon detector were recorded in five windows corresponding to 200–260 keV. The detector system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for decay and then converted to standard concentration units which were then converted to standard concentration units which were then converted to standard concentration units which were then converted to standard concentration units. All grids were then resampled from the 100 m cell size down to a 10 m cell size to produce the maps and find grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

NATURAL AIR ABSORBED DOSE RATE

Raw counts have been converted to radioelement concentrations, and combined to produce natural air-absorbed dose rate, so that the results are independent of crystal volume and planned survey height. This facilitates comparisons to other surveys and ground data. Measurements are nanograys per hour (nGy/h).

CONTOUR INTERVAL

_____		50 nGy/h
_____		10 nGy/h
_____		5 nGy/h

SURVEY HISTORY

This map has been compiled and drawn under contract between the State Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Stevens Exploration Management Corp. in 1997 and 1998. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee of \$35.00. The maps are available for purchase at Alaska 99709-3707, and are downloadable for free from the DGGS website (www.dggs.dnr.state.ak.us/pubs). Maps are also available on paper through the DGGS office, and are available online at the website in Adobe Acrobat (.PDF) file format.

Section Outline Map U.S. Geological Survey Bulletin A-1, 1971; B-1, 1974; Tanana A-6, 1966; B-6, 1972; Gadsdenville, Alaska

SCALE 1:63,360

LOCATION INDEX

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEMV Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D134 magnetometer. The RS-500 gamma-ray spectrometer was flown at a height of 200 feet. In addition, the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350B-3S Supermer helicopter at a mean terrain clearance of 200 feet along N-S (Z) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L 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 1 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) meridian, 1927 North American datum using a central meridian (CM) of 153° 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.

RADIOMETRICS
The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410-2810 keV), uranium (1660-1860 keV), potassium (1370-1570 keV), total radioactivity (400-2815 keV) and cosmic radiation (2000-6000 keV). Counts from the radon detector were recorded in the radon window (1660-1860 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

NATURAL AIR ABSORBED DOSE RATE (nGy/h) OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PARTS OF MELOZITNA and TANANA QUADRANGLES

by
Laurel E. Burns, Fugro Airborne Surveys Corp., and Stevens Exploration Management Corp.
2010

NATURAL AIR ABSORBED DOSE RATE

Raw counts have been converted to radiocesium concentrations, and combined to produce natural air-absorbed dose rate, so that the results are independent of crystal volume and planned survey height. This facilitates comparisons to other surveys and ground data. Measurements are nanograms per hour (nGy/h).

CONTOUR INTERVAL

..... 50 nGy/h
..... 10 nGy/h
..... 5 nGy/h

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 (DGGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the area were acquired and processed by Fugro Airborne Surveys Corp. in 2009 and 2010. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geological & Geophysical Mineral Inventory Program. All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGGS, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGGS website (www.dggs.dnr.state.ak.us/pub/). Maps are also available on paper through the DGGGS office and are viewable online at the website in Adobe Acrobat PDF file format.

Base from U.S. Geological Survey 1:50,000 A-1, 1972; A-2, 1972; B-1, 1972; B-2, 1972; and 1:50,000 C-1, 1972.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Scintrex CES3 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an RS-500-B3 Sentinel helicopter at a mean terrain clearance of 200 feet along N-S (or) 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-G2L 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 5) spheroid, 1927 North American datum using a central meridian (CM) of 153° 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.

SCALE 1:63,360
1 2 3 4 MILES
1 2 3 4 5 KILOMETERS

RADIOELEMENT - TERNARY OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

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RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.B. (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410-2810 keV), uranium (1660-1860 keV), potassium (1370-1570 keV), total radioactivity (400-2815 keV) and cosmic radiation (3000-34000 keV). Counts from the radon detector were recorded in the radon window (1660-1860 keV). The radon detection system was calibrated following methods outlined in USA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

LOCATION INDEX

SURVEY HISTORY

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Base from U.S. Geological Survey Bulletin A-1, 1970; B-1, 1972; Tanana A-6, 1960; B-6, 1972; Goodingham, Alaska.

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[®] Electromagnetic (EM) system, Radiation Solutions RS-500 gamma-ray spectrometer and a Fugro D1344 magnetometer with a Scintrex G33 cesium sensor. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (Z) 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-G2L 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 100 feet. American datums were projected onto the Clarke 1866 (UTM zone 5) and the 1927 North American datum using a central meridian (CM) of 153° north constant of 0 and were east constant of 500,000. Vertical accuracy of the presented data is better than 10m with respect to the UTM grid.

RADIOELEMENT - TERNARY OF THE MORAN SURVEY AREA, SOUTH-CENTRAL MELOZITNA MINING DISTRICT, CENTRAL ALASKA

PARTS OF MELOZITNA and TANANA QUADRANGLES

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RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410-2810 keV), uranium (1660-1860 keV), potassium (1370-1570 keV), total radioactivity (400-2815 keV) and cosmic radiation (2000-6000 keV). Counts from the radon detector were recorded in the radon window (1660-1860 keV). The radon detection system was calibrated following methods outlined in USA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

SCALE 1:63,360
0 1 2 3 4 MILES
0 1 2 3 4 KILOMETERS
CONTINENTAL SHEET 100,000

LOCATION INDEX

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