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GPR 2014_002_ReadMe.PDF

FAREWELL SURVEY AREA: Airborne Magnetic, Electromagnetic, and Radiometric Data in Line (Point), Grid, Vector, and Map formats, part of the McGrath and Lime Hills quadrangles, south-central Alaska

by

L.E.Burns, CGG, and Fugro Geosciences

PROJECT AND TECHNICAL INFORMATION

Project Name:.....Farewell
Contracting Agency: .....State of Alaska, Department of Natural Resources,
.....Division of Geological & Geophysical Surveys (DGGS)
DGGS Section:.....Minerals Section
Program:.....Alaska Strategic & Critical Mineral Capital Improvement Project,
.....part of the Alaska Airborne Geophysical/Geological Mineral Inventory
.....(AGGMI) Program
Funding Source:.....Alaska State Legislature and Cook Inlet Region, Inc (CIRI)
Land Information: Most of the land is State owned. CIRI land is shown in Figure 3 of the browse_graphic.pdf file. Permission must be obtained from CIRI to obtain access to their land.
CIRI contact information: CIRI Land and Resources Department (http://www.ciri.com/our-lands/)
Land ownership web sites: Alaska State, Alaska Mapper (http://dnr.alaska.gov/MapAK/) and U.S. BLM Land Record site (http://sdms.ak.blm.gov/sdms/)
Contractor: .....Fugro GeoServices, Inc.
Survey Flown By: .....CGG
Additional Information: Fugro Airborne Surveys started the survey and was bought by CGG during the course of the project. No changes were made to the management, office personnel, or field management between the period of this contract.
CGG Project Number:.....12084
DGGS Contract Manager:.....Laurel E. Burns
Data Acquisition: .....Digitally acquired
Line miles (km):.....4466.2 (7187.39 km)
Data Acquisition:
Start Date (YYYY-MM-DD):.....2012-10-11
End Date (YYYY-MM-DD):.....2012-10-22

Start Date (YYYY-MM-DD):.....2013-07-09
End Date (YYYY-MM-DD):.....2013-09-27
Platform: .....Helicopter
Platform: Model:.....AS-350-B3 Squirrel
Survey Altitude Model:.....Mean terrain clearance (height above ground)
Nominal Helicopter Height:.....200 feet
Nominal Bird Height: .....100 feet
Traverse: Line Azimuth: .....N60°W (heading of 120 degrees)
Traverse: Line Spacing: .....1/4 mile (402.3 m)
Tie: Line Azimuth:.....N30°E (heading of 210 degrees)
Tie: Line Spacing:.....approximately 3 miles (approximately 4828 m)
Border lines:.....present around all non-parallel and non-perpendicular edges
Magnetics: Magnetometer: .....Scintrex CS3 cesium censor, mounted in bird

Electromagnetics: Sensor Model: .....Dighem(V)
Navigation System: Sensor: .....Global Positioning System
Navigation System: Sensor: .....Novatel OEM5-GL2
Navigation System: Method: .....Post-flight differential positioning
Additional equipment: Radar and laser altimeters, video camera, and 50/60 Hz monitors

CONTENTS of the PUBLICATION:

This publication, GPR2014-2, consists of 6 categories of downloadable zip files plus metadata and supplementary files such as this file. The publication will also be available on DVD(s) with files in the root directory and in 7 main folders: metadata, linedata, grids, geotiffs, kmzs, maps, and vectors.

ROOT DIRECTORY FILES:

gpr2014_002_readme.....This file; PDF and TXT format
gpr2014_002_browsegraphic.pdf ..... Location figures and some images; pdf format

.....	Figure 1: Alaska map showing location of the Farewell survey and nearby surveys
.....	Figure 2: Location figure showing location of the Farewell survey and adjacent surveys in the McGrath, Lime Hills, Tyonek , and Talkeetna USGS 1:250,000-scale quadrangles
.....	Figure 3: Location figure showing the Farewell survey and the location of CIRI land. For information about CIRI land, see "Land Information" and "CIRI contact" above.
.....	Figure 4: Location figure showing map sheet index for maps included with this publication. All maps with this publication are 1:63,360-scale.

METADATA
Metadata is provided in three formats.

GPR2014-2.faq.html .....Hypertext Markup Language format (Question and Answer)
GPR2014-2.txt .....ASCII text
GPR2014-2.xml .....Extensible Markup Language format

LINEDATA

Farewell_linedata.txt.....	Channel list
Farewell_EM.gdb.....	Oasis Montaj binary GDB database format for mag & EM
Farewell_RAD.gdb	Oasis Montaj binary GDB database format for RAD
Farewell_EM_part1.XYZ	L10550-L21331; Oasis Montaj ASCII XYZ format for mag and EM
Farewell_EM_part2.XYZ	L21340-L21843; Oasis Montaj ASCII XYZ format for mag and EM
Farewell_EM_part3.XYZ	L21850-T29320; Oasis Montaj ASCII XYZ format for mag and EM
Farewell_RAD_part1.XYZ.....	L10550-L21331; Oasis Montaj ASCII XYZ format for RAD
Farewell_RAD_part2.XYZ.....	L21340-L21843; Oasis Montaj ASCII XYZ format for RAD
Farewell_RAD_part3.XYZ.....	L21850-T29320; Oasis Montaj ASCII XYZ format for RAD
Farewell_EM_XYZtoGDB.i0.....	Oasis Montaj import template for XYZ file for mag & EM
Farewell_RAD_XYZtoGDB.i0	Oasis Montaj import template for XYZ file for RAD

OVERVIEW: GRIDS, GEOTIFFS, and GOOGLE EARTH KMZs (3 Separate Folders on DVD)
The same data are provided as grids, GeoTiffs, and Google Earth KMZs files. Cell sizes vary. Details are mentioned in the paragraphs below. The list of the files and the definition is provided below the short sections for the three folders. Gridded

files can be manipulated to produce different images. Each GeoTiff and KMZ file is just basically one image. For the grids that were made into maps, the corresponding images in the GeoTiff and KMZ files are the same image used for the grid in the map.

GRIDS

Grid files are provided in two cell sizes, 80 or 100 m and 25 m. The 80 and 100 m grids were the original grids, which were resampled to make the 25 m grids. All map images are made from the 25 m grids. These map images are also used for all the GeoTIFFs and KMZs except for the 3 resistivity grids with "_80m" at the end of the name. These are provided for comparison of the blank areas in the resistivity data between the two cell sizes. An image from these three 80 m resistivity grids are also provided as GeoTIFFs and KMZs. The blank areas are caused by calculations being meaningless where flight height is to high due to terrain. Resampling exacerbated the blank areas in certain places.

All grids are provided in Geosoft binary float and ER Mapper formats. Two files are included for one Geosoft file: the grid file (.GRD) and the projection file (.GRD.GI). Three files are provided for ER Mapper data -- a header (.ERS), a data file (no extension), and the projection file (.ERS.GI).

GRID FILES

Frl_MagRMI_80	Original residual magnetic intensity (RMI) (nT) - with IGRF removed
Frl_MagRMI_25	Resampled residual magnetic intensity (RMI) (nT) with IGRF removed
Frl_MagIGRF_80	Original Total magnetic field (nT), with IGRF removed
Frl_MagIGRF_25	Resampled Total magnetic field (nT), with IGRF removed
Frl_1VD_80	Original First vertical derivative 'dz' (nT/m) of the RMI
Frl_1VD_25	Resampled First vertical derivative 'dz' (nT/m) of the RMI
Frl_ASig_80	Original Analytic signal (nT/m) calculated from the RMI
Frl_ASig_25	Resampled Analytic signal (nT/m) calculated from the RMI
Frl_TiltDer_80	Original Tilt derivative (degrees) of the RMI
Frl_TiltDer_25	Resampled Tilt derivative (degrees) of the RMI
Frl_Res56k_80	Original Apparent coplanar resistivity (ohm-m) for 56,000 (56k) Hz
Frl_Res56k_25	Resampled Apparent coplanar resistivity (ohm-m) for 56,000 (56k) Hz
Frl_Res7200_80	Original Apparent coplanar resistivity (ohm-m) for 7200 Hz
Frl_Res7200_25	Resampled Apparent coplanar resistivity (ohm-m) for 7200 Hz
Frl_Res900_80	Original Apparent coplanar resistivity (ohm-m) for 900 Hz
Frl_Res900_25	Resampled Apparent coplanar resistivity (ohm-m) for 900 Hz
Frl_TC_cc_100	Original Corrected total counts (cps)
Frl_TC_cc_25	Resampled Corrected total counts (cps)
Frl_K_cc_100	Original Corrected potassium counts (cps)
Frl_K_cc_25	Resampled Corrected potassium counts (cps)
Frl_Th_cc_100	Original Corrected thorium counts (cps)
Frl_Th_cc_25	Resampled Corrected thorium counts (cps)
Frl_U_cc_100	Original Corrected uranium counts (cps)
Frl_U_cc_25	Resampled Corrected uranium counts (cps)
Frl_eTh_100	Original Equivalent thorium (ppm)
Frl_eTh_25	Resampled Equivalent thorium (ppm)
Frl_eU_100	Original Equivalent uranium (ppm)
Frl_eU_25	Resampled Equivalent uranium (ppm)
Frl_pK_100	Original Percent potassium (%)
Frl_pK_25	Resampled Percent potassium (%)
Frl_nadr_100	Original Natural air absorbed dose rate [nGy/h (nanogray per hour)]
Frl_nadr_25	Resampled Natural air absorbed dose rate [nGy/h (nanogray per hour)]
Frl_ratio_eTh_pK_100	Original Equivalent thorium / percent potassium ratio (ppm/%)
Frl_ratio_eTh_pK_25	Resampled Equivalent thorium / percent potassium ratio (ppm/%)
Frl_ratio_eU_pK_100	Original Equivalent uranium / percent potassium ratio (ppm/%)
Frl_ratio_eU_pK_25	Resampled Equivalent uranium / percent potassium ratio (ppm/%)
Frl_ratio_eU_eTh_100	Original Equivalent uranium / equivalent thorium (unitless)

Frl_ratio_eU_eTh_25	Resampled Equivalent uranium / equivalent thorium (unitless)
Frl_DTM_100	Original Digital terrain or elevation model (m)
Frl_DTM_25	Digital terrain or elevation model (m)
Frl_AltLasBird_100	Original EM bird height (m) above surface, measured by laser altimeter in EM bird
Frl_AltLasBird_25	EM bird height (m) above surface, measured by laser altimeter in EM bird

GEOTIFFS & KMZs

The images used in all files in the GeoTIFF and KMZ zip files are made from the 25 m cell size grids, except for the three resitivity grids that include "80m" in the name, and the radiometric 'ternary' file.

All file names in the GeoTIFF folder have the extension '.TIF'. GeoTIFF files automatically register correctly as NAD 27, UTM Zone 5N in GIS programs. GeoTiff files can be opened in any graphics program and as long as the file is not saved, the registration information will still be valid. RGB color (255,255,255) can be set to transparent if required.

KMZS

All files in the KMZs folder have the extension '.kmz' (Google Earth zip format). One may drag and drop the KMZ files into 'My Places" in the free downloadable Google Earth program (http://earth.google.com/download-earth.html); data will be automatically registered with the locational information used by Google Earth, i.e. WGS84 datum and CGS projection.

GRID FILES

Frl_MagRMI	Residual magnetic intensity (RMI) (nT) – final with IGRF removed
Frl_MagIGRF	Total magnetic field (nT) - final, with IGRF removed
Frl_1VD	First vertical derivative 'dz' (nT/m) of the RMI
Frl_ASig	Analytic signal (nT/m) calculated from the RMI
Frl_TiltDer	Tilt derivative (degrees) of the RMI
Frl_Res56k	Apparent coplanar resistivity (ohm-m) for 56,000 (56k) Hz
Frl_Res56k_80m	Image made from original grid for apparent coplanar resistivity (ohm-m) for 56,000 (56k) Hz
Frl_Res7200	Apparent coplanar resistivity (ohm-m) for 7200 Hz
Frl_Res7200_80m	Image made from original grid for apparent coplanar resistivity (ohm-m) for 7200 Hz
Frl_Res900	Apparent coplanar resistivity (ohm-m) for 900 Hz
Frl_Res900_80m	Image made from original grid for apparent coplanar resistivity (ohm-m) for 900 Hz
Frl_TC_cc	Corrected total counts (cps)
Frl_K_cc	Corrected potassium counts (cps)
Frl_Th_cc	Corrected thorium counts (cps)
Frl_U_cc	Corrected uranium counts (cps)
Frl_eTh	Equivalent thorium (ppm)
Frl_eU	Equivalent uranium (ppm)
Frl_percentK	Percent potassium (%)
Frl_nadr	Natural air absorbed dose rate [nGy/h (nanogray per hour)]
Frl_ratio_eTh_percentK	Equivalent thorium / percent potassium ratio (ppm/%)
Frl_ratio_eU_percentK	Equivalent uranium / percent potassium ratio (ppm/%)
Frl_ratio_eU_eTh	Equivalent uranium / equivalent thorium (unitless)
Frl_DTM	Digital terrain or elevation model (m)
Frl_AltLasBird	EM bird height (m) above surface, measured by laser altimeter in EM bird
Frl_ternary	Radiometric ternary diagram

VECTORS (Folder)

Data contours provided were made for the maps with this publication. The vectors are provided in ESRI shape file (SHP) format and Autocad DXF. The files can be opened in variety of geophysical and GIS/CAD software such as Oasis Montaj, MapInfo, ArcGIS, and AutoCAD

DATA CONTOURS:

Frl_MagRMI ..... Residual magnetic intensity (RMI) (nT) - final
Frl_ASig..... Analytic signal (nT/m) calculated from the RMI
Frl_TiltDer ..... Tilt derivative (degrees) of the RMI
Frl_Res56k..... Apparent coplanar resistivity (ohm-m) for 56,000 (56k) Hz
Frl_Res7200..... Apparent coplanar resistivity (ohm-m) for 7200 Hz.
Frl_Res900..... Apparent coplanar resistivity (ohm-m) for 9000 Hz.
Frl_eTh..... Equivalent thorium (ppm)
Frl_eU ..... Equivalent uranium (ppm)
Frl_percentK ..... Percent potassium (%)
Frl_nadr..... Natural air absorbed dose rate [nGy/h (nanogray per hour)]
Frl_ratio_eTh_percentK..... Equivalent thorium / percent potassium ratio (ppm/%)
Frl_ratio_eU_percentK ..... Equivalent uranium / percent potassium ratio (ppm/%)
Frl_ratio_eTh_eU..... Equivalent thorium / equivalent uranium ratio (unitless)

OTHER VECTORS:

Frl_FP ..... Flight path
Frl _SecGrid..... Alaska PLSS Section Grid for the map sheets; includes
..... township and range labels.
Frl _UTMGrid..... Alaska UTM Grid for the map sheets; includes UTM labels on edges

MAPS (Folder)

The HPGL/2 files were created with HP Designjet T1300ps HPGL driver v61.132.2518.500 and plot on some plotters, but not all plotters correctly. The Adobe Acrobat format files were created with Adobe Acrobat Distiller v9.0 from Postscript files. The HPGL/2 files have brighter colors and sharper topography than the Adobe Acrobat files, and should be used or requested if at all possible. Freeware software 'printfile' , available currently at (http://www.lerup.com/printfile) prints HPGL/2 files easily on compatible printers. The Adobe Acrobat format files were created with Adobe Acrobat Distiller v9.0 from Postscript files.

Four sheets are needed to cover the area at 1:63,360-scale. Sheet A is in the north; sheet B is the central west; sheet C is the central east; and sheet D is in the south. See gpr2014-2_browsegraphic.pdf, figure 4.

Zip files include:

gpr2014-2_MAPS_1A-7D_asHPGL2.zip
gpr2014-2_MAPS_8A-13D_asHPGL2.zip
gpr2014-2_MAPS_14A-22D_asHPGL2.zip
gpr2014-2_MAPS_23A-29D_asHPGL2.zip
gpr2014-2_MAPS_1A-7D_asPDF.zip
gpr2014-2_MAPS_8A-13D_asPDF.zip
gpr2014-2_MAPS_14A-22D_asPDF.zip
gpr2014-2_MAPS_23A-29D_asPDF.zip

Map No.	Grid shown	With
GPR2014-2-1	Residual magnetic intensity, IGRF removed	topography
GPR2014-2-2	Residual magnetic intensity, IGRF removed	magnetic contours
GPR2014-2-3	First vertical derivative of the RMI	topography
GPR2014-2-4	Analytic Signal of the RMI	topography
GPR2014-2-5	Analytic Signal of the RMI	Analytic signal contours
GPR2014-2-6	Tilt Derivative of the RMI	Topography and Tilt Derivative contours
GPR2014-2-7	Shadowed RMI	Topography and Tilt Derivative contours
GPR2014-2-8	56K Hz coplanar apparent resistivity	topography
GPR2014-2-9	56K Hz coplanar apparent resistivity	56K contours
GPR2014-2-10	7200 Hz coplanar apparent resistivity	topography
GPR2014-2-11	7200 Hz coplanar apparent resistivity	7200 contours
GPR2014-2-12	900 Hz coplanar apparent resistivity	topography
GPR2014-2-13	900 Hz coplanar apparent resistivity	900 contours
GPR2014-2-14	Thorium / Potassium (eTh/% K)	topography
GPR2014-2-15	Thorium / Potassium (eTh/% K)	eTh/% K contours
GPR2014-2-16	Uranium / Postassium (eU/% K)	topography
GPR2014-2-17	Uranium / Postassium (eU/% K)	eU/% K contours
GPR2014-2-18	Uranium / Thorium (eU/eTh)	topography
GPR2014-2-19	Uranium / Thorium (eU/eTh)	eU/eTh contours
GPR2014-2-20	Potassium (% K)	topography
GPR2014-2-21	Potassium (% K)	percent K contours
GPR2014-2-22	Thorium (eTh)	topography
GPR2014-2-23	Thorium (eTh)	eTh contours
GPR2014-2-24	Uranium (eU)	topography
GPR2014-2-25	Uranium (eU)	eU contours
GPR2014-2-26	Natural air absorbed dose rate (nGy/h)	topography
GPR2014-2-27	Natural air absorbed dose rate (nGy/h)	NADR contours
GPR2014-2-28	Radioelement-Ternary image	topography
GPR2014-2-29	Flight path	topography

PROJECTION INFORMATION:

DATUM & PROJECTION ITEMS	GRIDS, GEOTIFFS, & VECTORS	LINEDATA: HORIZONTAL LOCATION CHANNELS		KMZ FILES
		X_NAD27z5n Y_NAD27z5n	LAT_WGS84 LON_WGS84	
DATUM	NAD27 Spheroid; Clarke 1866		WGS84	WGS84
PROJECTION	UTM Zone 5N		LAT/LON WGS 84	Simple Cylindrical / LAT/LON WGS 84
CENTRAL MERIDIAN	-153		-153	
FALSE EASTING	500000		500000	
FALSE NORTHING	0		0	
SCALE FACTOR	0.9996		0.9996	
NORTHERN PARALLEL	N/A		N/A	
BASE PARALLEL	N/A		N/A	
WGS84 TO LOCAL	Molodensky conversion method		Molodensky conversion method	
DELTA X SHIFT	+5		+5	
DELTA Y SHIFT	-135		-135	
DELTA Z SHIFT	-172		-172	

AVAILABILITY and TECHNICAL REQUIREMENTS:

- ON-LINE: All parts of this publication can be downloaded from the DGGS Web link http://dx.doi.org/10.14509/27291 in data groups, e.g. MapsAsPDFS. The downloadable groups are near the bottom of the web page.

- DVD-ROM: Purchased by mail, e-mail (mailto:dggspubs@alaska.gov), or in person from DGGS, 3354 College Road, Fairbanks, Alaska, 99709-3707 for $10 per DVD-ROM plus postage. http://www.dggs.alaska.gov/pubs/project-orderform/1006

MAPS: The PDF version of the maps may be viewed, downloaded, or printed individually from the same link as the downloads: http://dx.doi.org/10.14509/27291 or through the Farewell Geophysics Project page http://www.dggs.alaska.gov/pubs/project-orderform/1006 which will contain related geophysical or geological data that are produced in the future. Maps are also available on paper or Mylar through the DGGS office for $13/sheet plus mail costs.

- Please ask for the maps to be printed from HPGL/2 files to ensure the best quality image.

TECHNICAL REQUIREMENTS FOR USE OF THE DATA: Technical requirements for use of all of the data on this publication includes software with ability to use, import, or convert Geosoft float GRD, Geosoft binary GDB,, ESRI Shape files or Autocad DXF, Adobe Acrobat PDF, Google Earth files, and text files. Free downloadable interfaces to view or convert the gridded and shape files are available at the Geosoft Web site (http://www.geosoft.com; Oasis Montaj viewer). The KMZ files can be dragged and dropped into the 'My Places' folder of the free downloadable 'Google Earth' software. Freeware software 'printfile' (http://www.lerup.com/printfile) prints HPGL/2 files easily on compatible printers. The HPGL/2 files have brighter colors and sharper topography than the PDF maps and should be used for printing when possible. The PDF format maps are the only maps digitally viewable in this publication.

If you have any problems with this archive please contact Laurel Burns or the current geophysicist at the DGGS office.