

# **SHAW CREEK AND SHAWNEE PEAK AIRBORNE MAGNETIC AND RADIOMETRIC GEOPHYSICAL SURVEY**

Emond, A.M., and MPX Geophysics LTD

**Geophysical Report 2020-16**

2020  
STATE OF ALASKA  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS





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# **SHAW CREEK AND SHAWNEE PEAK AIRBORNE MAGNETIC AND RADIOMETRIC GEOPHYSICAL SURVEY**

Emond, A.M.,<sup>1</sup> and MPX Geophysics LTD<sup>2</sup>

## **ABSTRACT**

The Shaw Creek and Shawnee Peak airborne magnetic and radiometric geophysical survey covers parts of the Big Delta and Eagle quadrangles northeast of Delta Junction, Alaska (fig. 1). Magnetic and radiometric data were collected with a helicopter July 4–25, 2020 by MPX Geophysics LTD. A total of 10,100 line kilometers were collected over approximately 2,600 square kilometers. The magnetometer was mounted to a forward-facing fixed boom (“stinger”). The radiometric crystals were located in the cabin of the helicopter.

Data were collected in eight named blocks. Mertie Mountains, Shaw Creek, and Volkmar River have a line spacing of 400 meters (m) and a mean ground clearance of 130 m. Stoneboy has a line spacing of 200 m and a mean ground clearance of 80 m. Eagle, Echo, Healy, and LMS-X have a line spacing of 100 m and a mean ground clearance of 80 m.

## **PURPOSE**

The data from the Shaw Creek and Shawnee Peak airborne magnetic and radiometric geophysical survey will be used for guiding geologic mapping, promoting resource exploration, generating mineral exploration targets, and be a part of the continuous regional magnetic data coverage of the Yukon Tanana Uplands.

Portions of these blocks were collected over existing airborne geophysical data. These portions were collected to improve the magnetic data quality and resolution in these areas to support mineral exploration and targeting.

## **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.

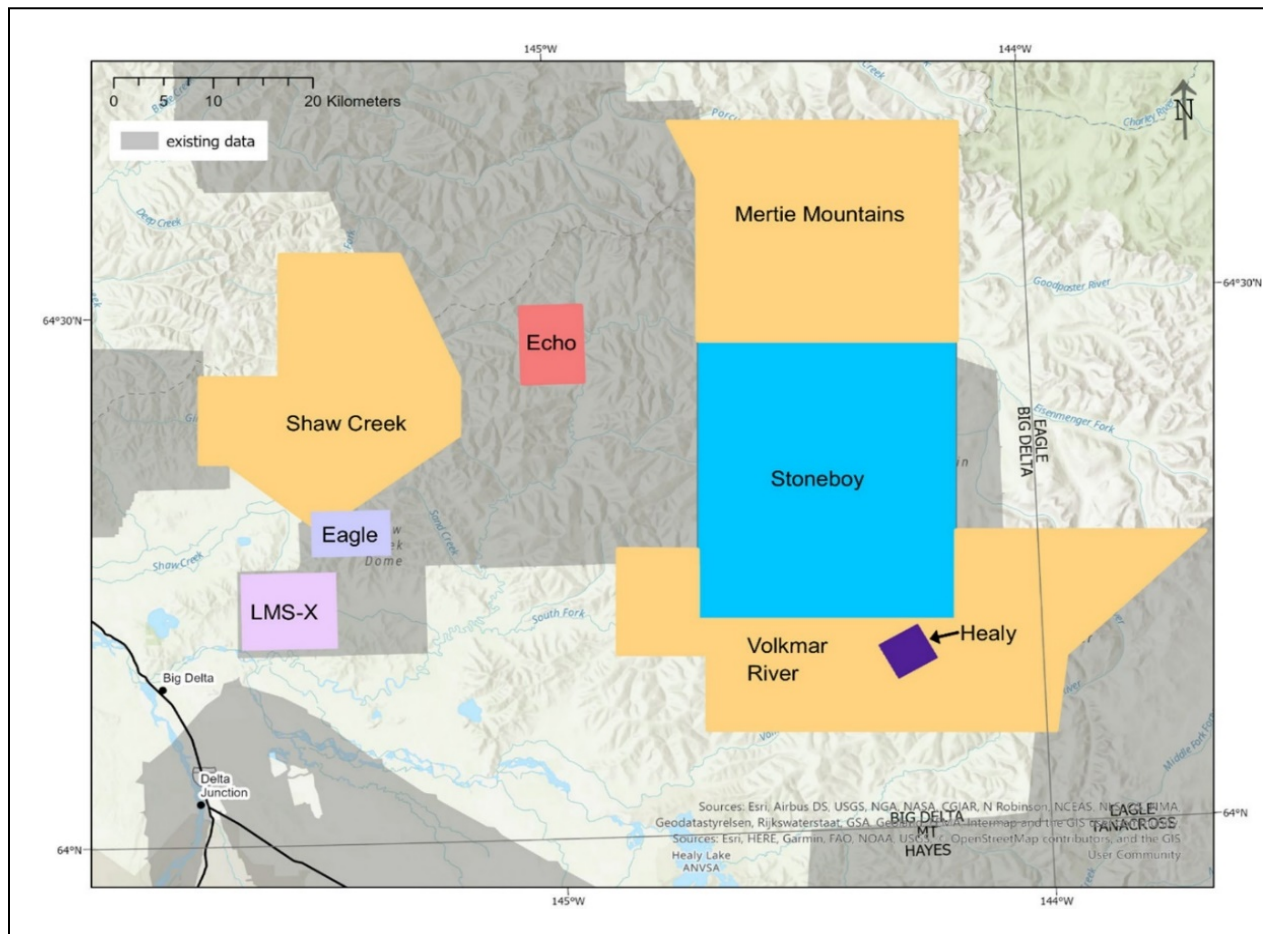
## **ACKNOWLEDGMENTS**

This work was supported by State of Alaska and by industry partners Northern Star (Pogo) LLC, Millrock Resources Inc., and Northway Resources Corp.

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<sup>1</sup> Alaska Division of Geological & Geophysical Surveys, 3354 College Road, Fairbanks, Alaska 99709-3707

<sup>2</sup> 4-355 Harry Walker Parkway North, Newmarket, Ontario, L3Y7B3, Canada



**Figure 1.** Named geophysical survey blocks location map with major roads, towns, and 1:250,000-scale USGS quadrangle boundaries. Prior DGGS surveys shown in gray.



**AVAILABLE DATA**

<b>Data Type</b>	<b>Provider</b>	<b>Description</b>
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	Project report
grids_ermapper	contractor	Geographically registered gridded data, ER Mapper ERS format
grids_geosoft	contractor	Geosoft-format gridded data
images_registered	contractor	RGB GeoTiff format images of gridded data
kmz	contractor	keyhole markup language (kml) kmz archive files of project data. Viewable in Google Earth and other compatible programs
maps_pdf_format	contractor	Printable and geographically registered maps in pdf format. Compatible with mobile device navigation and desktop mapping applications
maps_geosoft_format	contractor	maps as Geosoft packed map files
maps_jpg_format	contractor	Printable maps jpg format
photos_flightpath	contractor	Survey flight path downward facing photos with GPS location in exif data
vector_data	contractor	Line path and survey boundary in ESRI shapefile (SHP) format

## PROCESS STEPS

DATE	STEP	DETAIL
2020	Data collection, processing, and delivery	The airborne geophysical data were acquired under contract with MPX Geophysics Ltd. Airborne geophysical data for the areas were acquired and processed by MPX Geophysics Ltd. The contractor's project report and other supporting documents are in the "documents" digital data package. They provide detailed documentation of the system specifications, data collection, processing, and delivery.
2020	Preliminary Data	DGGS published preliminary data 12 days after the completion of data collection
2020	Data Cataloged for Archival and Publication	All files were renamed and placed in a standardized set of folders according to the DGGS Geophysics Data Management Manual. DGGS generated additional supporting documentation, which includes readme text files, maps, figures, survey overview report, and FGDC compliant metadata. Preliminary data were removed from the DGGS website and replaced with reorganized data and more comprehensive documentation.

## MAPS

Maps in PDF (georeferenced), JPG, and Geosoft format were created by the contractor. The eleven map types available for each of the eight survey blocks are listed below and shown on the following pages.

### Location Map

- Flown flight path over USGS topographic maps as background layer

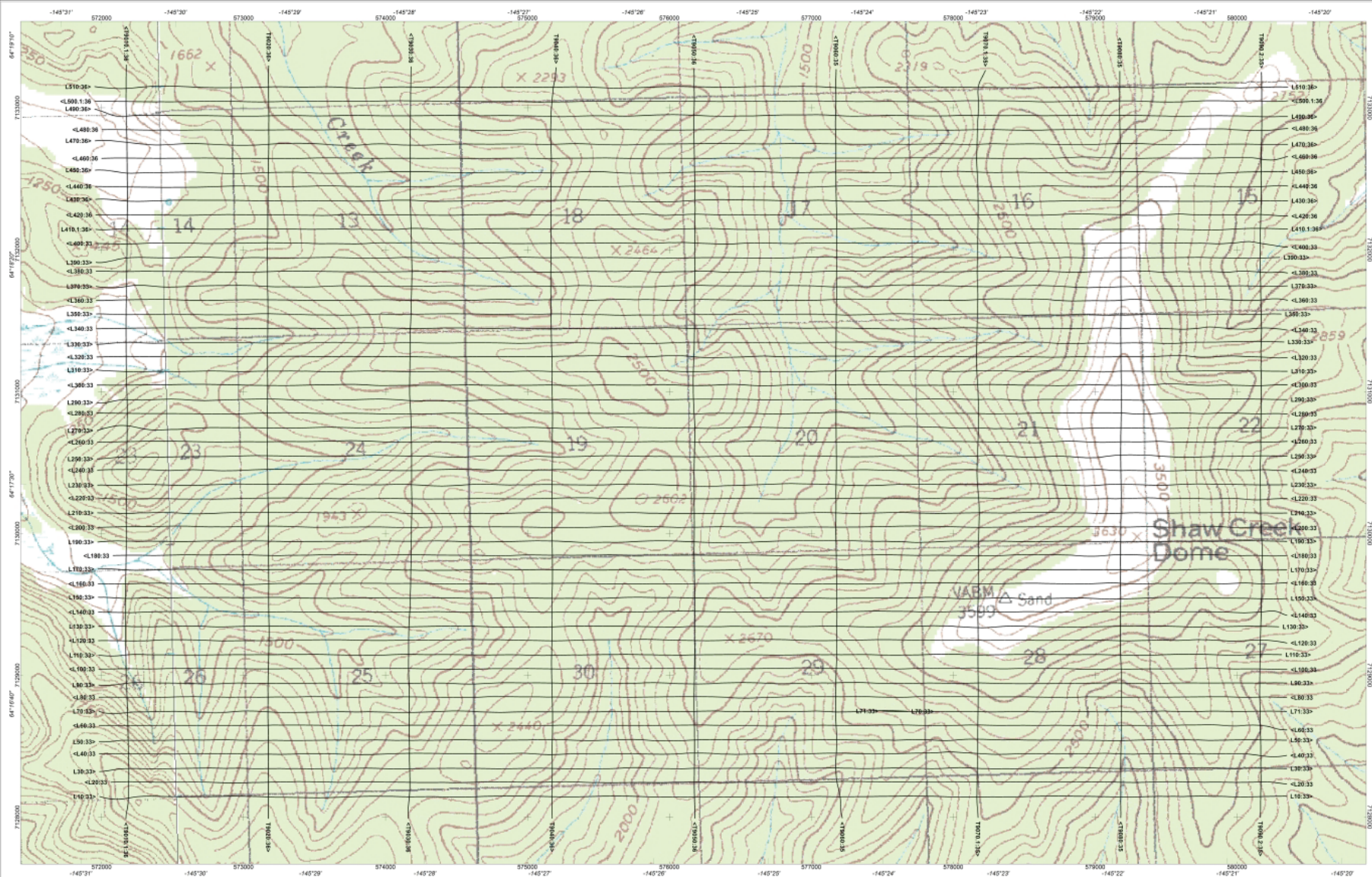
### Magnetic data

- Residual Magnetic Intensity in nT
- Calculated analytic signal of the residual magnetic field in nT/m
- Computed 1st vertical derivative of the residual magnetic field in nT/m

### Radiometric data

- Total Air Absorbed Dose Rate in nGy/h
- Equivalent concentration of Potassium (K) as percent K
- Equivalent concentration of Thorium (Th) in ppm
- Equivalent concentration of Uranium (U) in ppm
- Uranium Thorium Ratio
- Potassium Thorium Ratio
- Ternary Grid: percent K - equivalent U - equivalent Th





LEGEND	
Survey Date	July 2020
Map Scale	1:50,000
Map Projection	UTM
SURVEY PARAMETERS:	
Mean Terrain Clearance	80 meters
Maximum Clearance	80 meters
Minimum Clearance	80 meters
Tower Line Direction	80° (S)
Control Line Direction	80° (S)
Tower Line Spacing	100 m
Control Line Spacing	100 m
AIRBORNE MAGNETOMETER SYSTEM:	
Sensor	Scintrex CS-3 Magnetometer Sensor
Platform	and Pegasus Wing, Birgeley
Configuration	Configuration
Sampling Rate	25 readings/second
Sensitivity	0.02 nT
AIRBORNE GAMMA RAY SPECTROMETER:	
Sensor	Rockwell multi-channel gamma ray
Configuration	Spectrometer with 30.5 liter "downward looking"
Sampling Rate	Not used and 8.4 liter "upward looking"
Sensitivity	Not used
Temperature/Humidity	Variable
Sampling Rate	1 readings/second
AIRBORNE NAVIGATION SYSTEM:	
Sensor	Hemisphere 9320 GPS L1/L2
Configuration	Configuration
Sampling Rate	9 readings/second
Digital Camera	Canon V100
LASER ALTIMETER:	
Sensor	Scintrex CS-3 Magnetometer Sensor
Sampling Rate	25 readings/second
Sensitivity	0.02 nT
BASE STATION MAGNETOMETER:	
Sensor	Scintrex CS-3 Magnetometer Sensor
Sampling Rate	25 readings/second
Sensitivity	0.02 nT

Relative regional location of survey areas



Location of all the blocks collected



## Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne Magnetic and Radiometric Geophysical Survey

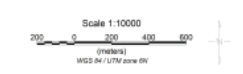
Flown Flight Path over USGS Topo Map

Eagle Block

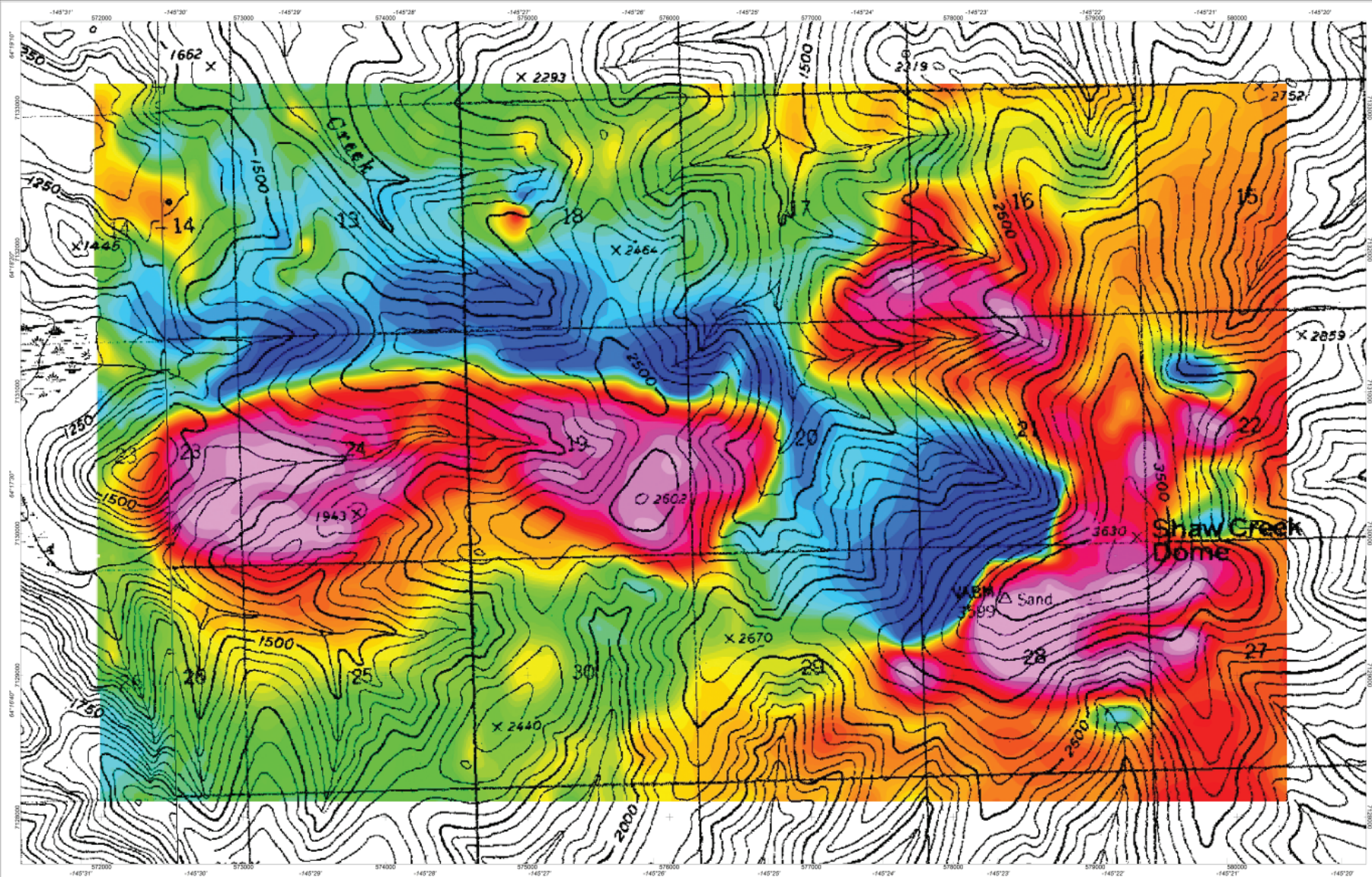
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**LEGEND**

Survey Date: July 2020  
 Mapping Type: Aeromagnetic  
 Registration: G-000V

**SURVEY PARAMETERS:**

Mean Terrain Clearance: 80 meters  
 Helicopter: 80 meters  
 Spectrometer: 80 meters  
 Magnetometer: 80 meters

Towson Line Division: 80' (S-80)  
 Control Line Division: 80' (S-80) 75' (S-75)  
 Towson Line Spacing: 100' (S-100)  
 Control Line Spacing: 100' (S-100)

**AIRBORNE MAGNETOMETER SYSTEM:**

Scintrex CS-3 Magnetometer Sensor and Fluxgate Mag. String  
 Configuration: 100' (S-100)  
 Sampling Rate: 1 heading/second  
 Sensitivity: 0.02 nT

**AIRBORNE GAMMA-RAY SPECTROMETER:**

Rock-E multi-channel gamma ray spectrometer with 30.9 cm "NaI(Tl) crystal"  
 Not used and 8.4 inch "NaI(Tl) crystal" not used  
 Temperature/Humidity: 100% humidity  
 Sampling Rate: 1 heading/second

**AIRBORNE NAVIGATION SYSTEM:**

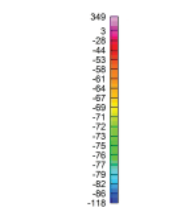
Hemisphere CS-3 GPS L1/L2  
 Sampling Rate: 1 heading/second  
 Digital Camera Garmin V180  
 (S-100)

**LASER ALTIMETER:**

Sampling Rate: 10 heading/second

**BASE STATION MAGNETOMETER:**

Geac G-1000 100' magnetometer  
 Sampling Rate: 1 heading/second  
 Sensitivity: 0.02 nT



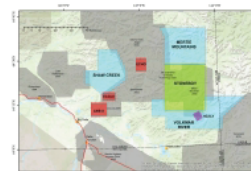
Residual Magnetic Intensity (nT)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne Magnetic and Radiometric Geophysical Survey

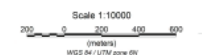
Residual Magnetic Intensity Map

Eagle Block

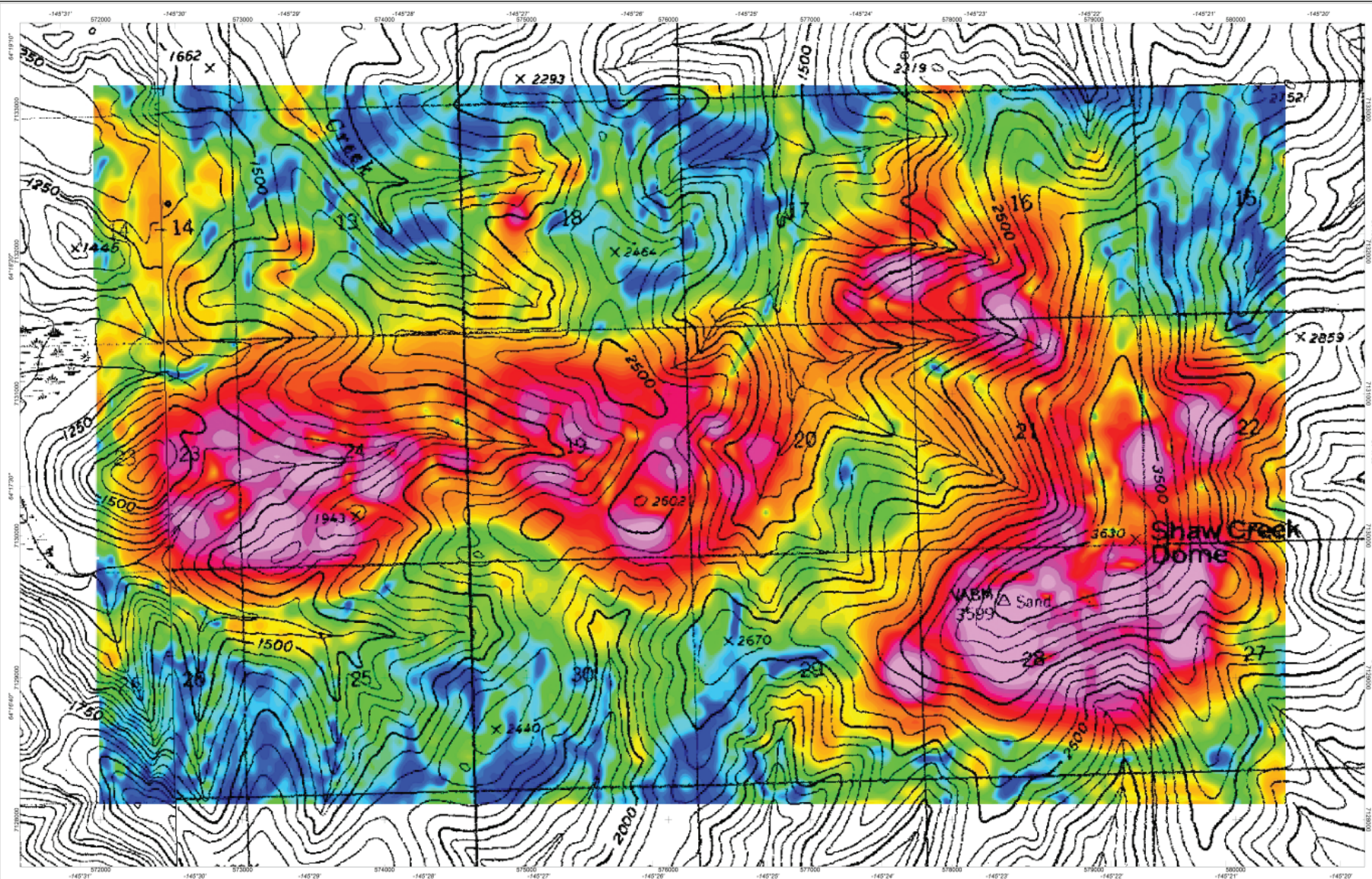
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#### LEGEND

Survey Date: 2020  
 Mapping Type: Magnetic

Survey Parameters:  
 Map-Turner Channel: 80 meters  
 Spectrometer: 80 meters  
 Magnetometer: 80 meters

Topographic Line Data:  
 Control Line Direction: 40° 30' 00" (N 40°)  
 Topographic Line Spacing: 100 m  
 Control Line Spacing: 100 m

#### AIRBORNE MAGNETOMETER SYSTEM

Software: CS-3 Magnetometer Sensor  
 and Fluxgate Map, Shingora  
 Configuration: 20 readings/second  
 Sampling Rate: 20 Hz

#### AIRBORNE GAMMA-RAY SPECTROMETER

SGS Gamma-ray spectrometer  
 Spectrometer with 20.5 liter "downward looking"  
 NaI scintillator and 4.4 liter "upward looking"  
 NaI scintillator - various  
 Sampling Rate: 1 readings/second

#### AIRBORNE NAVIGATION SYSTEM

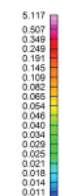
Hemisphere: NAD 83 UTM  
 Sampling Rate: 1 readings/second  
 Output: Gamma-ray

#### LASER ALTIMETER

Sampling Rate: 10 readings/second

#### BASE STATION MAGNETOMETER

GEOM G86-10TH magnetometer  
 Sampling Rate: 1 readings/second  
 Sampling Rate: 0.02 Hz

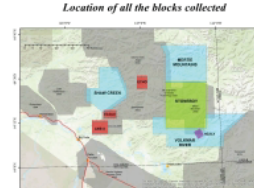


Analytic Signal  
 Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



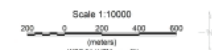
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Shaw Creek and Shawnee Peak Airborne  
 Magnetic and Radiometric Geophysical Survey

Analytic Signal Map

Eagle Block

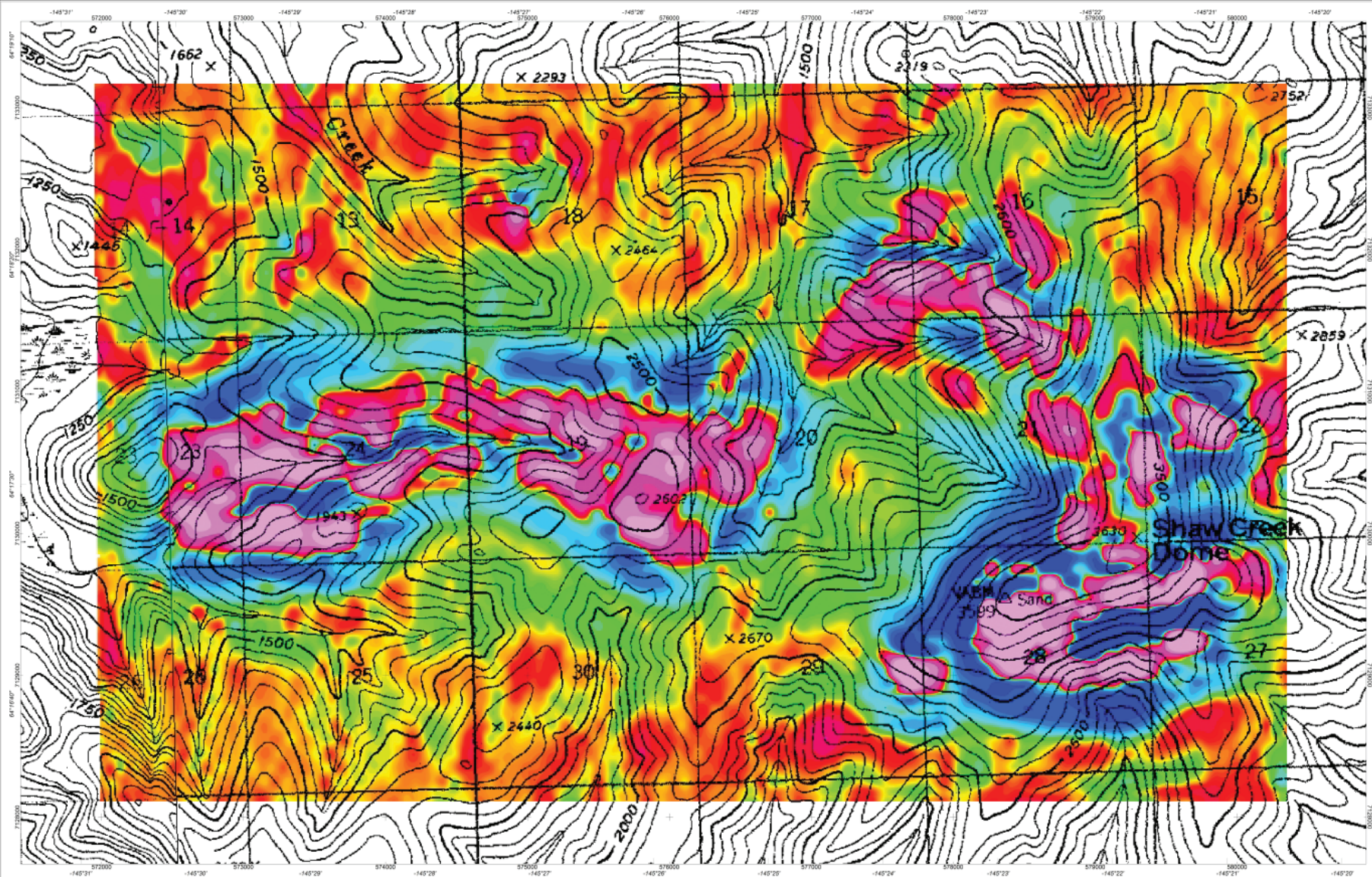
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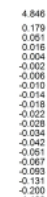
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<b>LEGEND</b>	
Survey Date	July 2020
Survey Type	Airborne
Regulation	C-0007
<b>SURVEY PARAMETERS:</b>	
Mean Terrain Clearance:	80 meters
Altitude:	80 meters
Spectrometer:	80 meters
Magnetometer:	80 meters
Towson Line Distance:	80' (24 m)
Control Line Distance:	80' (24 m)
Towson Line Spacing:	100 m
Control Line Spacing:	100 m
<b>AIRBORNE MAGNETOMETER SYSTEM:</b>	
Schnee CS-3 Magnetometer Sensor and Fluxgate Mag. String	String
Configuration:	25 m/segment
Sampling Rate:	2.0 Hz
<b>AIRBORNE GAMMA RAY SPECTROMETER:</b>	
Rock-E multi-channel gamma ray spectrometer with 30.9 cm "NaI(Tl) crystal"	
Not used and 8.4 inch "NaI(Tl) crystal"	
Temperature/Humidity - Vaisala	1 m/segment
Sampling Rate:	
<b>AIRBORNE NAVIGATION SYSTEM:</b>	
Hemisphere R200 GPS L1/L2	8 m/segment
Sampling Rate:	
Digital Camera Garmin V180	
<b>LASER ALTIMETER:</b>	
Sampling Rate:	10 m/segment
<b>BASE STATION MAGNETOMETER:</b>	
Rock-E multi-channel gamma ray spectrometer	1 m/segment
Sampling Rate:	2.0 Hz



Calculated 1st Vertical Derivative

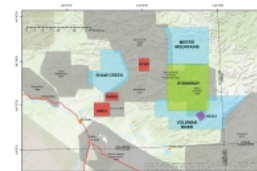
(nT/m)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne Magnetic and Radiometric Geophysical Survey

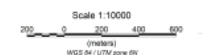
Calculated 1st Vertical Derivative Map

Eagle Block

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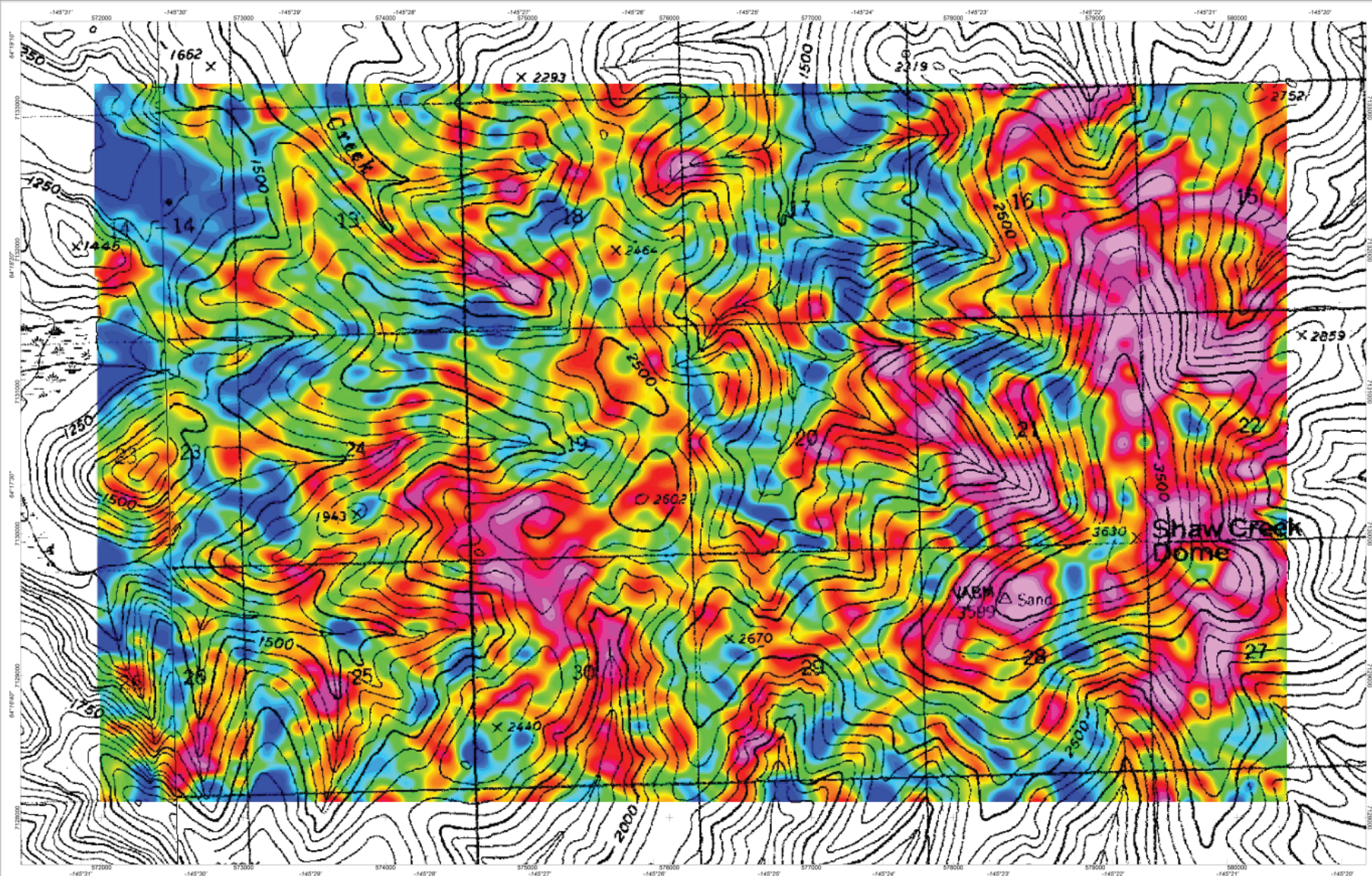
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**LEGEND**

Survey Date: July 2020  
 Mapping Type: Aeromagnetic  
 Registration: G-0000

**SURVEY PARAMETERS:**  
 Mean Terrain Clearance: 80 meters  
 Helicopter: 80 meters  
 Spectrometer: 80 meters  
 Magnetometer: 80 meters

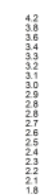
Towson Line Direction: 80° (S-80)  
 Control Line Direction: 80° (S-80)  
 Towson Line Spacing: 100 m  
 Control Line Spacing: 100 m

**AIRBORNE MAGNETOMETER SYSTEM:**  
 Scintrex CS-3 Magnetometer Sensor and Fluxgate Mag. String  
 Configuration: Standard  
 Sampling Rate: 1 heading/second  
 Resolution: 0.01 nT

**AIRBORNE GAMMA RAY SPECTROMETER:**  
 RGA-6 multi-channel gamma ray spectrometer with 30.9 liter "NaI(Tl) crystal"  
 Not used and 8.4 liter "NaI(Tl) crystal"  
 Not used  
 Temperature/Humidity: Variable  
 Sampling Rate: 1 heading/second

**AIRBORNE NAVIGATION SYSTEM:**  
 Hemisphere 9200 GPS L1/L2  
 Sampling Rate: 1 heading/second  
 Digital Camera Garmin V100  
 Sampling Rate: 1 heading/second  
 Resolution: 0.001 m

**BASE STATION MAGNETOMETER:**  
 Geoscientific Professional magnetometer  
 Sampling Rate: 1 heading/second  
 Resolution: 0.001 nT

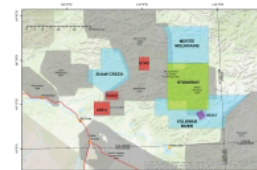


Uranium (eqU ppm)  
 Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



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Shaw Creek and Shawnee Peak Airborne Magnetic and Radiometric Geophysical Survey

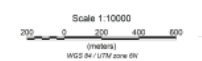
Uranium Map (eqU ppm)

Eagle Block

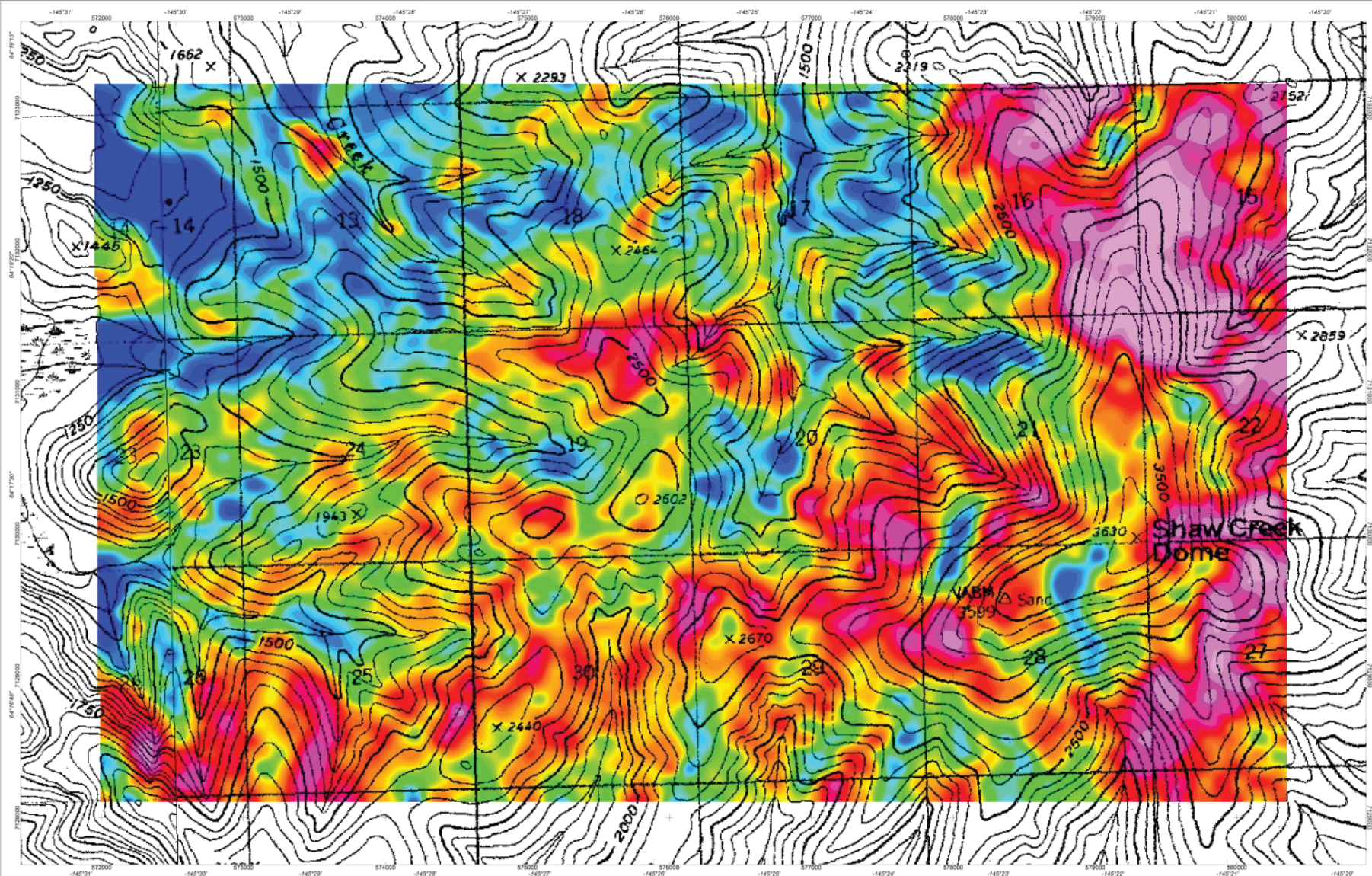
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**LEGEND**

Survey Date: July 2020  
 Mapping Type: Aeromagnetic  
 Registration: G-0000

**SURVEY PARAMETERS:**  
 Mean Terrain Clearance: 80 meters  
 Helicopter: 80 meters  
 Spectrometer: 80 meters  
 Magnetometer: 80 meters

Towson Line Direction: 80° (S-80)  
 Control Line Direction: 80° (S-80)  
 Towson Line Spacing: 100 m  
 Control Line Spacing: 100 m

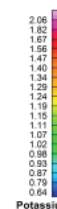
**AIRBORNE MAGNETOMETER SYSTEM:**  
 Scintrex CS-3 Magnetometer Sensor and Fluxgate Mag. String  
 Configuration: Standard  
 Sampling Rate: 1 readings/second  
 Sensitivity: 0.01 nT

**AIRBORNE GAMMA RAY SPECTROMETER:**  
 RGA-6 multi-channel gamma ray spectrometer with 30.9 liter "NaI(Tl) crystal"  
 Not sector and 8.4 liter "NaI(Tl) crystal"  
 Not sector  
 Temperature/Humidity: Variable  
 Sampling Rate: 1 readings/second

**AIRBORNE NAVIGATION SYSTEM:**  
 Hemisphere R200 GPS L1/L2  
 Sampling Rate: 1 readings/second  
 Digital Camera Garmin V180

**LASER ALTIMETER:**  
 Sampling Rate: 10 readings/second

**BASE STATION MAGNETOMETER:**  
 Geac G-1000  
 Sampling Rate: 1 readings/second  
 Sensitivity: 0.001 nT



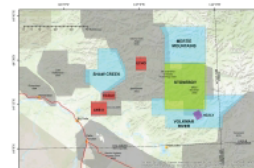
Potassium (K%)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne Magnetic and Radiometric Geophysical Survey

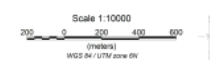
Potassium Map (K%)

Eagle Block

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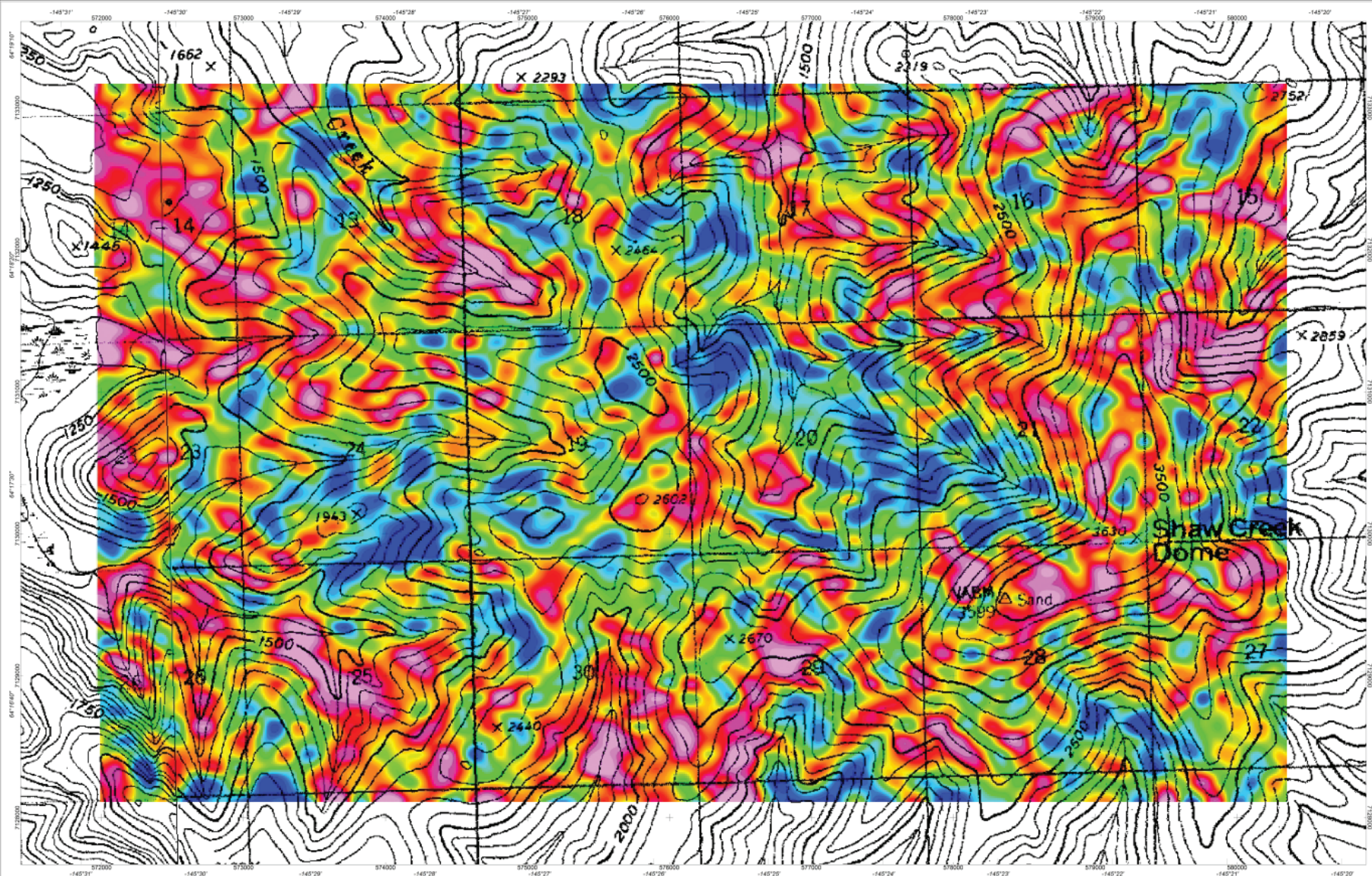
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**LEGEND**

Survey Date: July 2020  
 Mapping Type: Radiometric  
 Scale: 1:10,000  
 Projection: UTM  
 Datum: NAD 83  
 Units: Meters

**SURVEY PARAMETERS:**

Mean Terrain Clearance: 80 meters  
 Spectrometer: 80 meters  
 Magnetometer: 80 meters

Towson Line Direction: 80° (S-80)  
 Control Line Direction: 80° (S-80)  
 Towson Line Spacing: 100 m  
 Control Line Spacing: 100 m

**AIRBORNE MAGNETOMETER SYSTEM:**

Scintrex CS-3 Magnetometer Sensor and Fluxgate Mag. String  
 Configuration: 100 m  
 Sampling Rate: 1 m/s  
 Sensitivity: 0.1 nT

**AIRBORNE GAMMA-RAY SPECTROMETER:**

RAE SS multi-channel gamma ray spectrometer with 30.9 cm "NaI(Tl) crystal"  
 Not sector and 8.4 inch "NaI(Tl) crystal"  
 Not sector  
 Temperature/Humidity: 1 m/s  
 Sampling Rate: 1 m/s

**AIRBORNE NAVIGATION SYSTEM:**

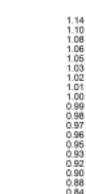
Hemisphere 9200 GPS L1/L2  
 Sampling Rate: 1 m/s  
 Digital Camera Sensor V800

**LASER ALTIMETER:**

Sampling Rate: 10 m/s

**BASE STATION MAGNETOMETER:**

Scintrex CS-3 Magnetometer  
 Sampling Rate: 1 m/s  
 Sensitivity: 0.1 nT



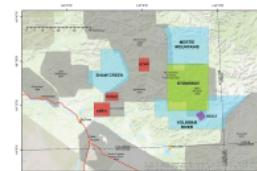
Ratio Uranium / Thorium  
 (eqU ppm / eqTh ppm)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
 Magnetic and Radiometric Geophysical Survey

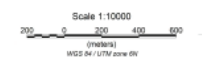
Ratio Uranium/Thorium Map (eqU/eqTh)

Eagle Block

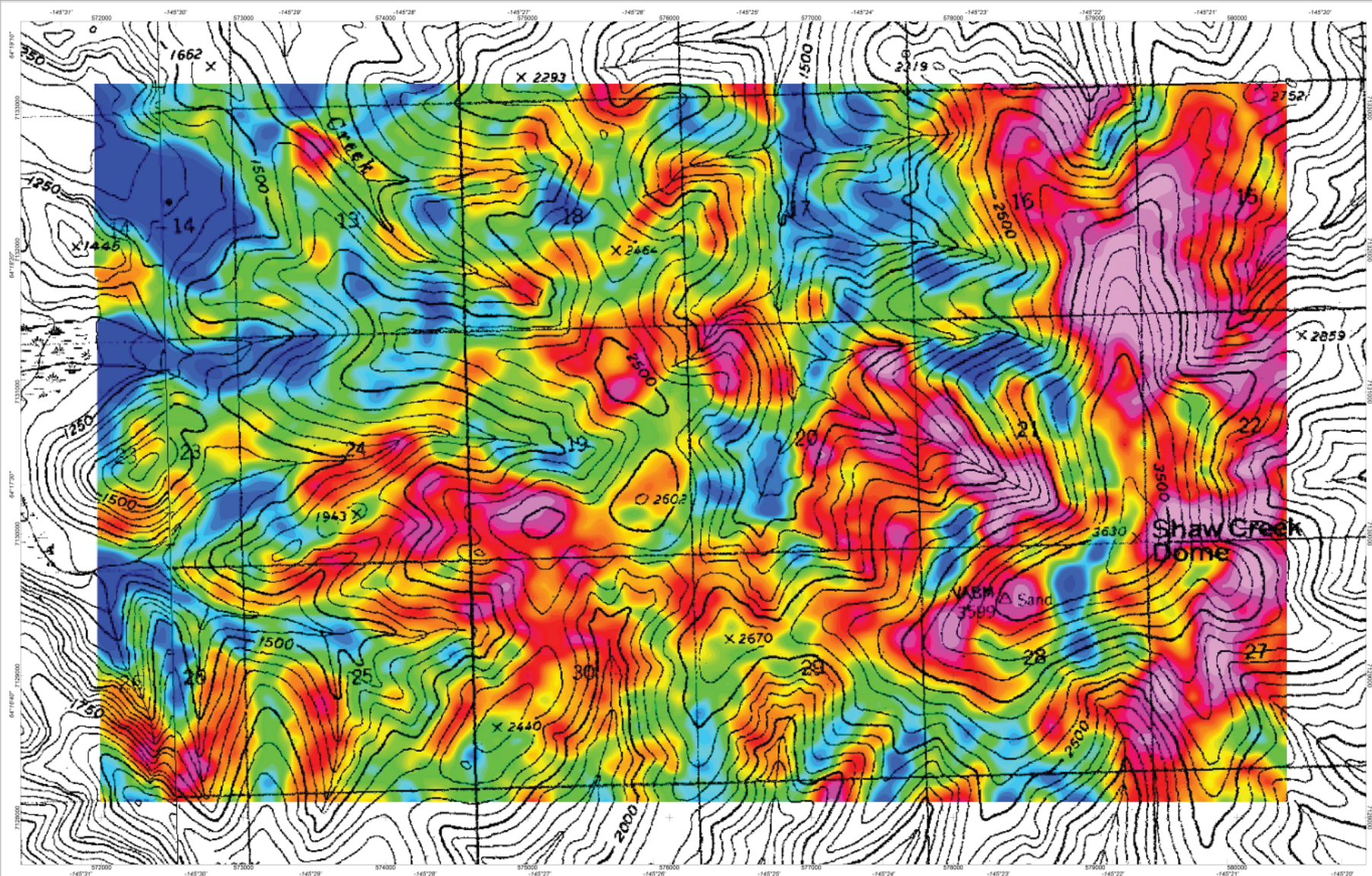
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**LEGEND**

Survey Date: July 2020  
 Magnetometer Type: GOMV  
 Registration: GOMV

**SURVEY PARAMETERS:**

Mean Terrain Clearance: 80 meters  
 Minimum: 80 meters  
 Maximum: 80 meters

Towson Line Orientation: 80° (S-80)  
 Control Line Orientation: 80° (S-80)  
 Towson Line Spacing: 100 m  
 Control Line Spacing: 100 m

**AIRBORNE MAGNETOMETER SYSTEM:**

Schnee CS-3 Magnetometer Sensor and Fluxgate Mag. Assembly  
 Configuration: Standard  
 Sampling Rate: 1 heading/second  
 Sensitivity: 0.2 nT

**AIRBORNE GAMMA RAY SPECTROMETER:**

RAE II multi-channel gamma ray spectrometer with 15.5 liter "NaI(Tl) crystal"  
 Not used and 8.4 liter "NaI(Tl) crystal" used  
 Temperature/Humidity: Variable  
 Sampling Rate: 1 heading/second

**AIRBORNE NAVIGATION SYSTEM:**

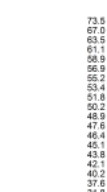
Hemisphere 9200 GPS L1/L2  
 Sampling Rate: 1 heading/second  
 Digital Camera Sensor: VRS

**LASER ALTIMETER:**

Sampling Rate: 10 heading/second

**BASE STATION MAGNETOMETER:**

Geac GOMV magnetometer  
 Sampling Rate: 1 heading/second  
 Sensitivity: 0.2 nT



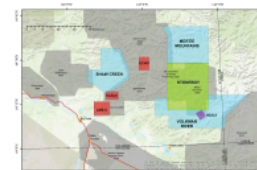
Total Air Absorbed Dose Rate (nGy/h)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne Magnetic and Radiometric Geophysical Survey

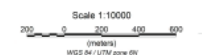
Total Air Absorbed Dose Rate Map (Taadr)

Eagle Block

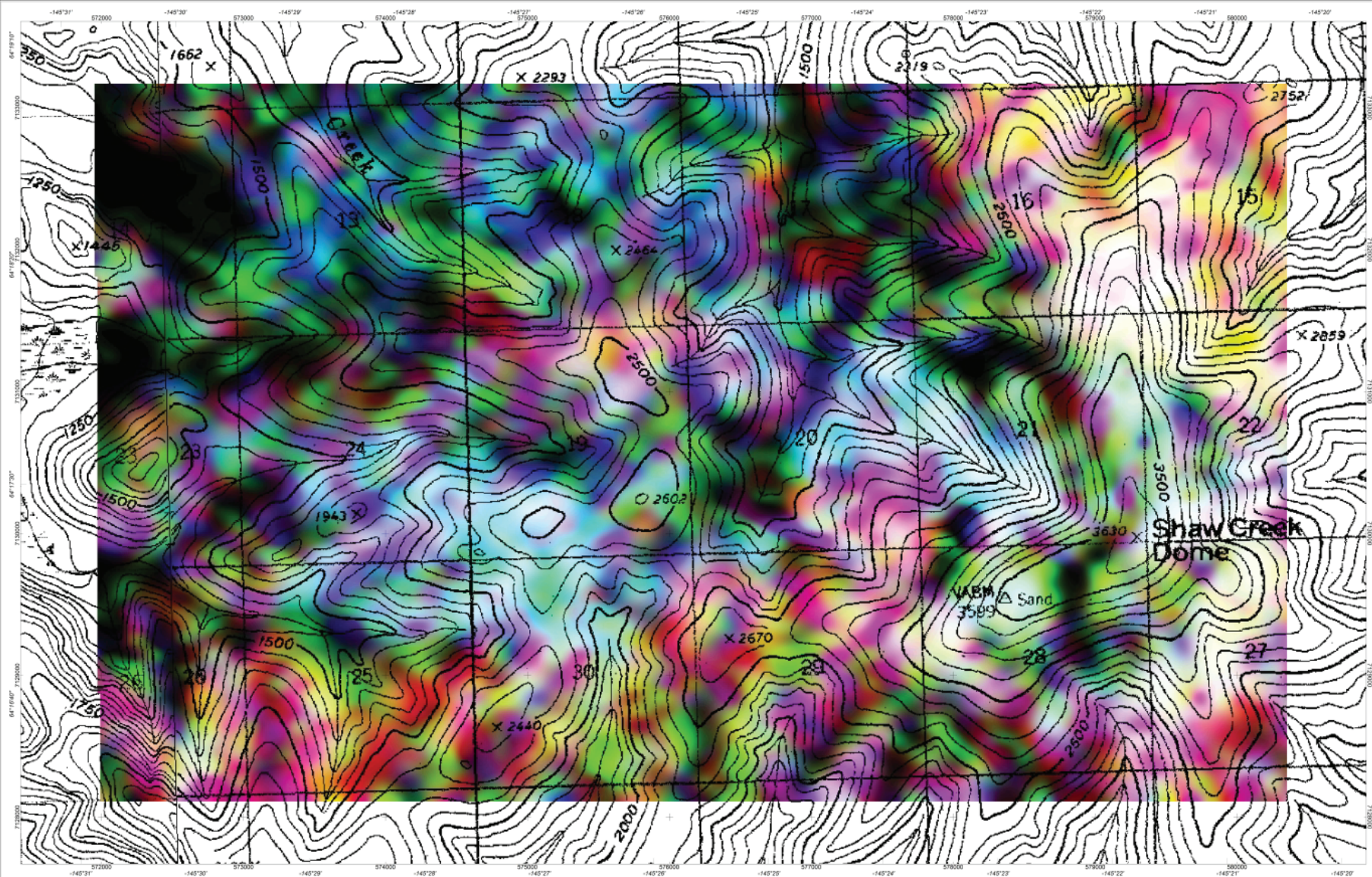
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**LEGEND**

Survey Date: July 2020  
 Survey Type: Geophysical

**SURVEY PARAMETERS:**  
 Mean Terrain Clearance: 80 meters  
 Spectrometer: 80 meters  
 Magnetometer: 80 meters  
 Tower/Lane Clearance: 80' (S-10)  
 Control Line Orientation: 81°40' (N-40)  
 Tower/Lane Spacing: 100 m  
 Control Line Spacing: 100 m

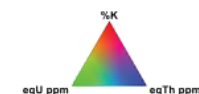
**AIRBORNE MAGNETOMETER SYSTEM:**  
 Scintrex CS-3 Magnetometer Sensor and Fluxgate Mag. String  
 Configuration: Standard  
 Sampling Rate: 1 reading/second  
 Sensitivity: 0.02 nT

**AIRBORNE GAMMA-RAY SPECTROMETER:**  
 RGA-6 multi-channel gamma ray spectrometer with 30.9 cm "NaI(Tl) crystal"  
 Not used and 8.4 inch "NaI(Tl) crystal"  
 Not used  
 Temperature/Humidity: Variable  
 Sampling Rate: 1 reading/second

**AIRBORNE NAVIGATION SYSTEM:**  
 Hemisphere 9200 GPS L1/L2  
 Sampling Rate: 1 reading/second  
 Digital Camera: Garmin V100

**LASER ALTIMETER:**  
 Sampling Rate: 10 readings/second

**BASE STATION MAGNETOMETER:**  
 Geac G-1000 1000 magnetometer  
 Sampling Rate: 1 reading/second  
 Sensitivity: 0.02 nT

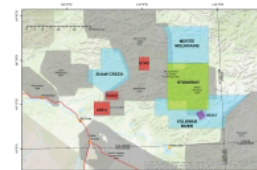


Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
 Magnetic and Radiometric Geophysical Survey

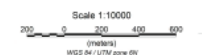
Ternary Map (%K - eqU ppm - eqTh ppm)

Eagle Block

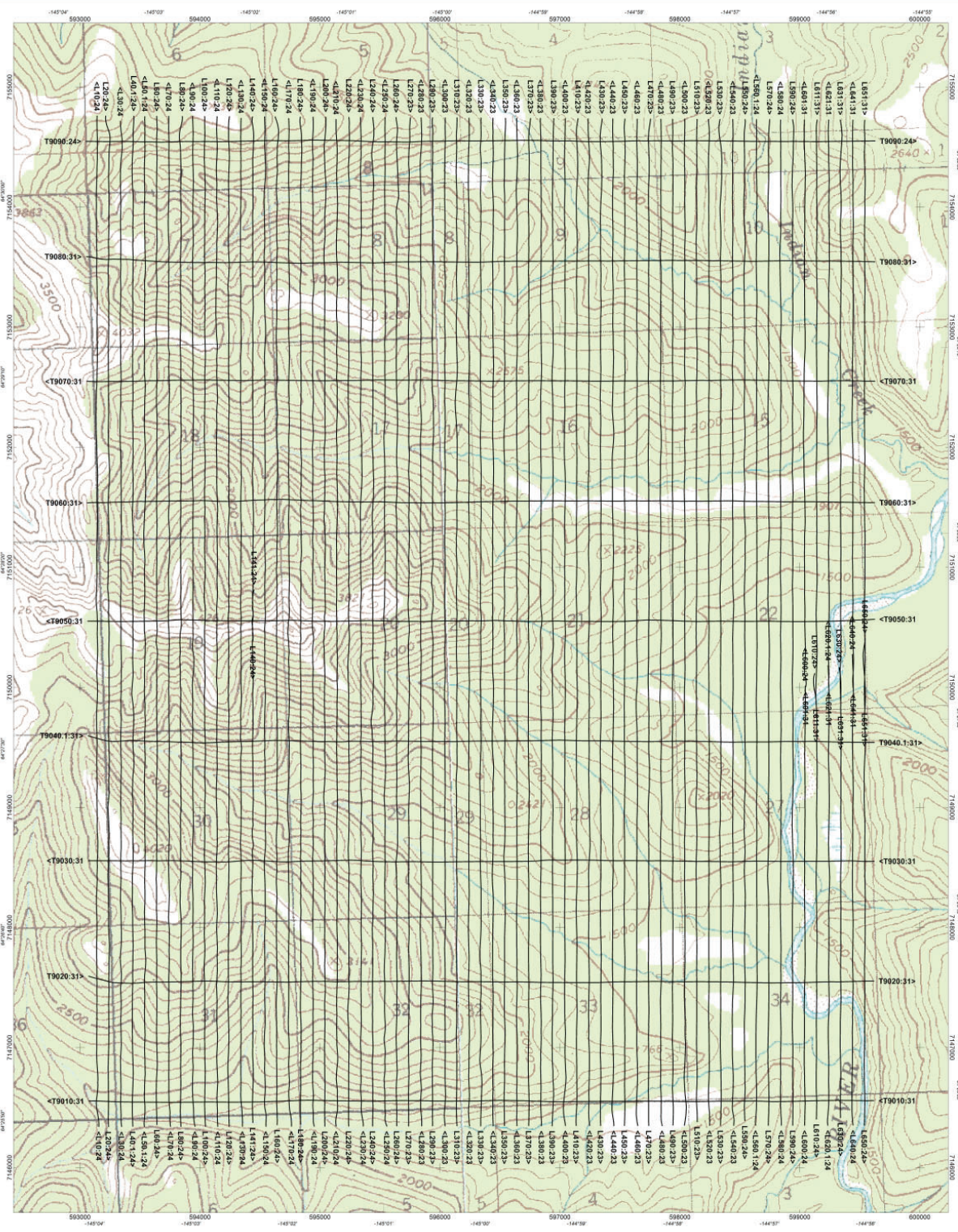
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**LEGEND**

Survey Date: July, 2020  
 Helicopter Type: AS330B2  
 Registration: C-GSVY

**SURVEY PARAMETERS:**

Mean Terrain Clearance: 80 meters  
 Helicopter: 80 meters  
 Magnetometer: 80 meters  
 Traverse Line Direction: 0180° (N-S)  
 Control Line Direction: 90° (E-W)  
 Traverse Line Spacing: 100 m  
 Control Line Spacing: 1000 m

**AIRBORNE MAGNETOMETER SYSTEM:**

Scintrex CS - 3 Magnetometer Sensor and Fluxgate Mag. Billingsley  
 Configuration: Stinger  
 Sampling Rate: 20 readings/second  
 Sensitivity: 0.01 nT

**AIRBORNE GAMMA-RAY SPECTROMETER:**

RSX-5 multi-channel gamma-ray Spectrometer with 33.6 liters "downward looking" NaI sensor and 8.4 liters "upward looking" NaI sensor.  
 Temperature/Humidity - Vaisala  
 Sampling Rate: 1 reading/second

**AIRBORNE NAVIGATION SYSTEM:**

Hemisphere R320 GPS L1/L2  
 Sampling Rate: 5 readings/second  
 Digital Camera Garmin VIRB

**LASER ALTIMETER:**

Sampling Rate: 10 readings/second

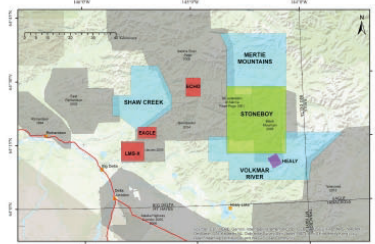
**BASE STATION MAGNETOMETER:**

GEM GSM-19TW magnetometer  
 Sampling Rate: 1 reading/second  
 Sensitivity: 0.022 nT

**Relative regional location of survey areas**



**Location of all the blocks collected**



**Alaska Division of Geological & Geophysical Surveys**

Shaw Creek and Shawnee Peak Airborne Magnetic and Radiometric Geophysical Survey

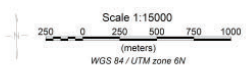
Flown Flight Path over USGS Topo Map

**Echo Block**

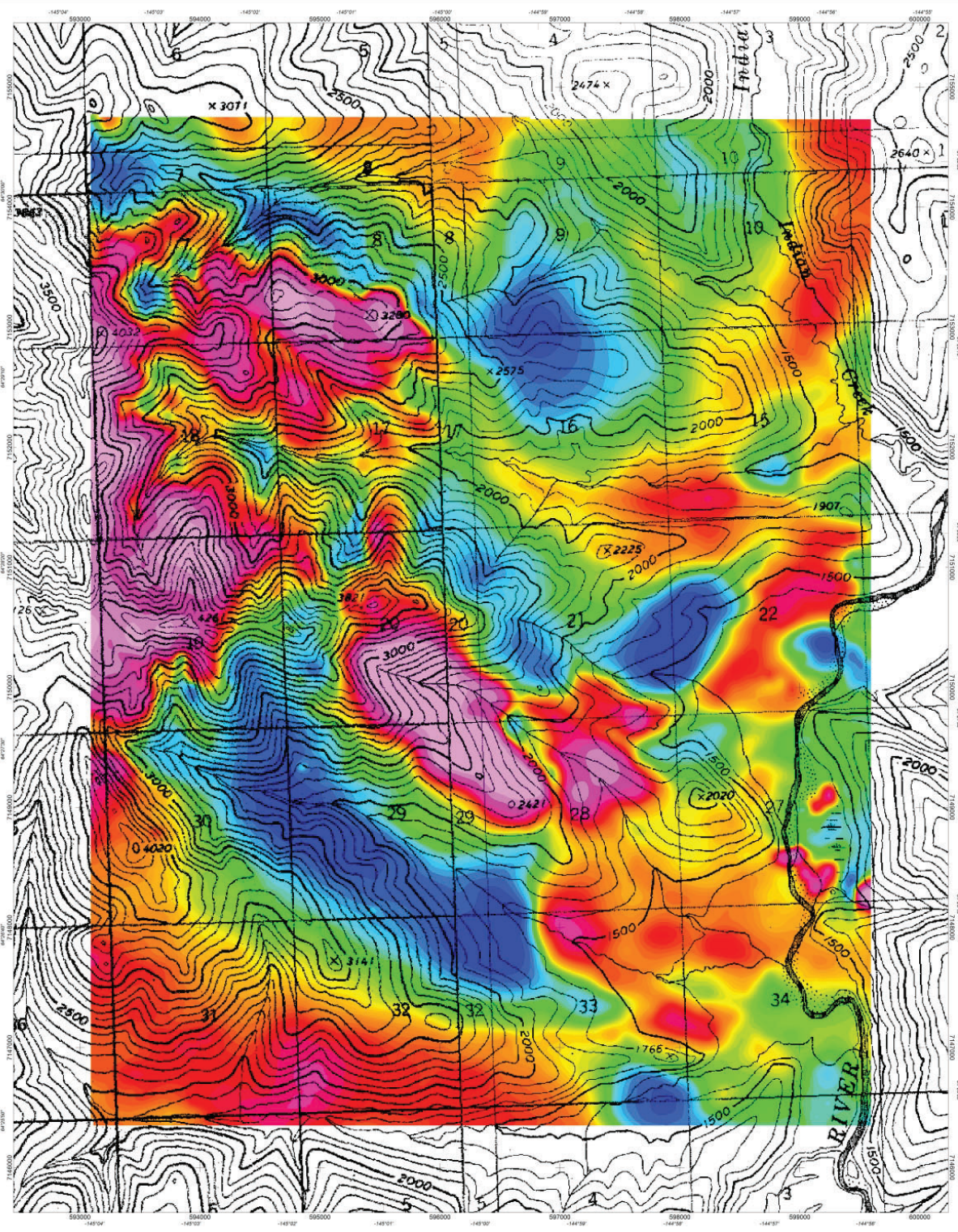
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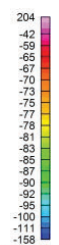
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LEGEND	
Survey Date:	July, 2020
Helicopter Type:	AS350B2
Registration:	C-GSVY
SURVEY PARAMETERS:	
Mean Terrain Clearance:	80 meters
Helicopter:	80 meters
Spectrometer:	80 meters
Magnetometer:	80 meters
Traverse Line Direction:	0180° (N-S)
Control Line Direction:	90° (E-W)
Traverse Line Spacing:	100 m
Control Line Spacing:	1000 m
AIRBORNE MAGNETOMETER SYSTEM:	
Scintrex CS-3 Magnetometer Sensor and Fluxgate Mag. Billingsley	
Configuration:	Stinger
Sampling Rate:	20 readings/second
Sensitivity:	0.01 nT
AIRBORNE GAMMA-RAY SPECTROMETER:	
RSK-5 multi-channel gamma-ray Spectrometer with 33.6 liters "downward looking" NaI sensor and 8.4 liters "upward looking" NaI sensor.	
Temperature/Humidity - Vaisala	
Sampling Rate:	1 reading/second
AIRBORNE NAVIGATION SYSTEM:	
Hemisphere R200 GPS L1/L2	
Sampling Rate:	5 readings/second
Digital Camera Garmin VIRB	
LASER ALTIMETER:	
Sampling Rate:	10 readings/second
BASE STATION MAGNETOMETER:	
GEM GSM-19TW magnetometer	
Sampling Rate:	1 reading/second
Sensitivity:	0.002 nT



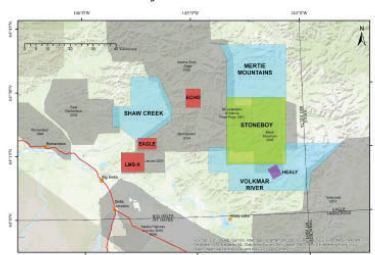
Residual Magnetic Intensity (nT)

Contours: USGS Topo Map

Relative regional location of survey areas

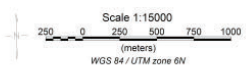


Location of all the blocks collected



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Alaska Division of Geological & Geophysical Surveys

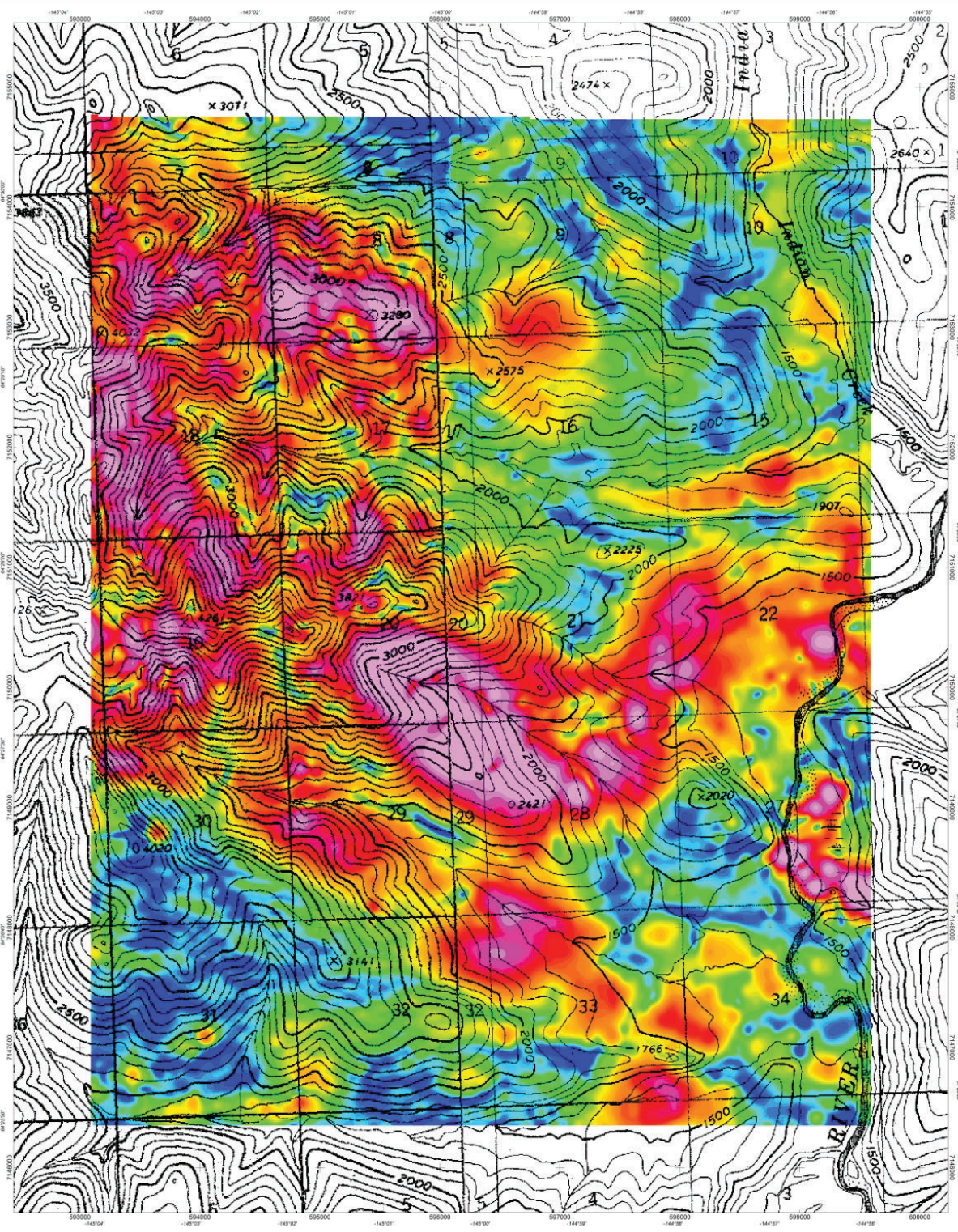
Shaw Creek and Shawnee Peak Airborne Magnetic and Radiometric Geophysical Survey

Residual Magnetic Intensity Map

Echo Block

Geophysical Report 2020-16





**LEGEND**

Survey Date: July, 2020  
 Helicopter Type: AS350B2  
 Registration: C-GSVY

**SURVEY PARAMETERS:**

Mean Terrain Clearance: 80 meters  
 Helicopter: 80 meters  
 Spectrometer: 80 meters  
 Magnetometer: 80 meters  
 Traverse Line Direction: 0180° (N-S)  
 Control Line Direction: 90° (E-W)  
 Traverse Line Spacing: 100 m  
 Control Line Spacing: 1000 m

**AIRBORNE MAGNETOMETER SYSTEM:**

Scintrex CS - 3 Magnetometer Sensor  
 and Fluxgate Mag. Billingsley  
 Configuration: Stinger  
 Sampling Rate: 20 readings/second  
 Sensitivity: 0.01 nT

**AIRBORNE GAMMA-RAY SPECTROMETER:**

RSX-5 multi-channel gamma-ray  
 Spectrometer with 33.6 liters "downward looking"  
 NaI sensor and 8.4 liters "upward looking"  
 NaI sensor.  
 Temperature/Humidity - Vaisala  
 Sampling Rate: 1 reading/second

**AIRBORNE NAVIGATION SYSTEM:**

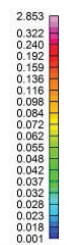
Hemisphere R200 GPS L1/L2  
 Sampling Rate: 5 readings/second  
 Digital Camera Garmin VIRB

**LASER ALTIMETER:**

Sampling Rate: 10 readings/second

**BASE STATION MAGNETOMETER:**

GEM GSM-19TW magnetometer  
 Sampling Rate: 1 reading/second  
 Sensitivity: 0.002 nT



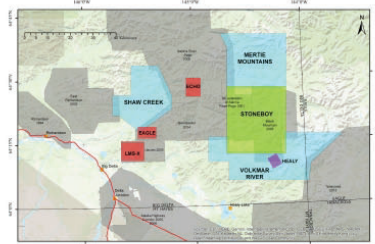
Analytic Signal (nT/m)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



**Alaska Division of Geological & Geophysical Surveys**

Shaw Creek and Shawnee Peak Airborne  
 Magnetic and Radiometric Geophysical Survey

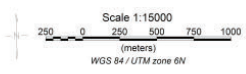
Analytic Signal Map

Echo Block

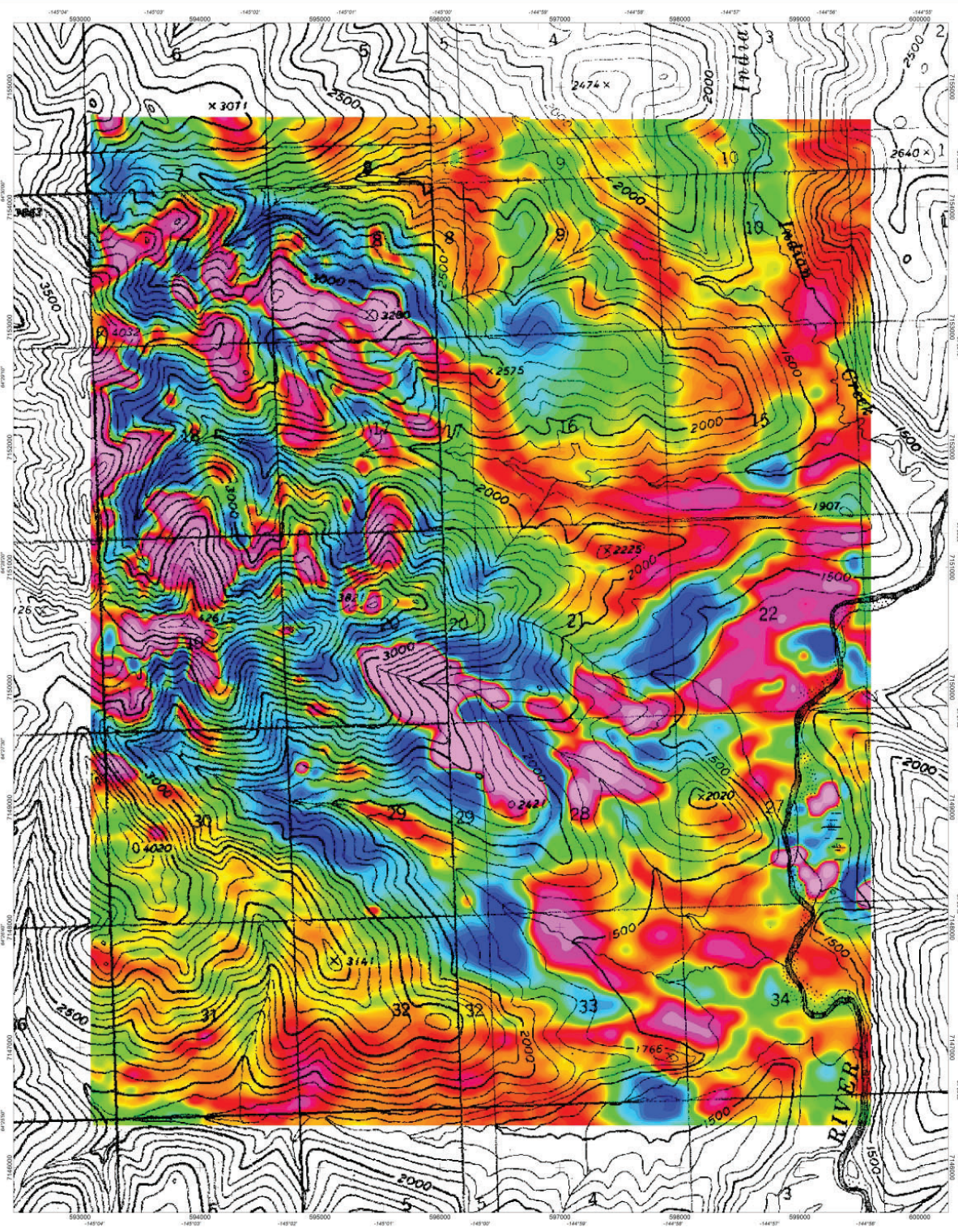
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**LEGEND**

Survey Date:	July, 2020
Helicopter Type:	AS350B2
Registration:	C-GSVY
<b>SURVEY PARAMETERS:</b>	
Mean Terrain Clearance:	80 meters
Helicopter:	80 meters
Spectrometer:	80 meters
Magnetometer:	80 meters
Traverse Line Direction:	0180° (N-S)
Control Line Direction:	90° (E-W)
Traverse Line Spacing:	100 m
Control Line Spacing:	1000 m

**AIRBORNE MAGNETOMETER SYSTEM:**

Scintrex CS - 3 Magnetometer Sensor and Fluxgate Mag. Billingsley	
Configuration:	Stinger
Sampling Rate:	20 readings/second
Sensitivity:	0.01 nT

**AIRBORNE GAMMA-RAY SPECTROMETER:**

RSX-5 multi-channel gamma-ray Spectrometer with 33.6 liters "downward looking" NaI sensor and 8.4 liters "upward looking" NaI sensor.	
Temperature/Humidity - Vaisala	
Sampling Rate:	1 reading/second

**AIRBORNE NAVIGATION SYSTEM:**

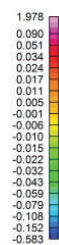
Hemisphere R200 GPS L1/L2	
Sampling Rate:	5 reading/second
Digital Camera Garmin VIRB	

**LASER ALTIMETER:**

Sampling Rate:	10 readings/second
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**BASE STATION MAGNETOMETER:**

GEM GSM-19TW magnetometer	
Sampling Rate:	1 reading/second
Sensitivity:	0.002 nT



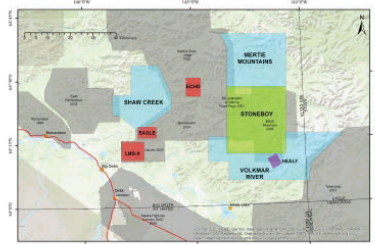
Calculated 1st Vertical Derivative (nT/m)

Contours: USGS Topo Map

Relative regional location of survey areas

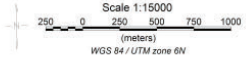


Location of all the blocks collected



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Alaska Division of Geological & Geophysical Surveys

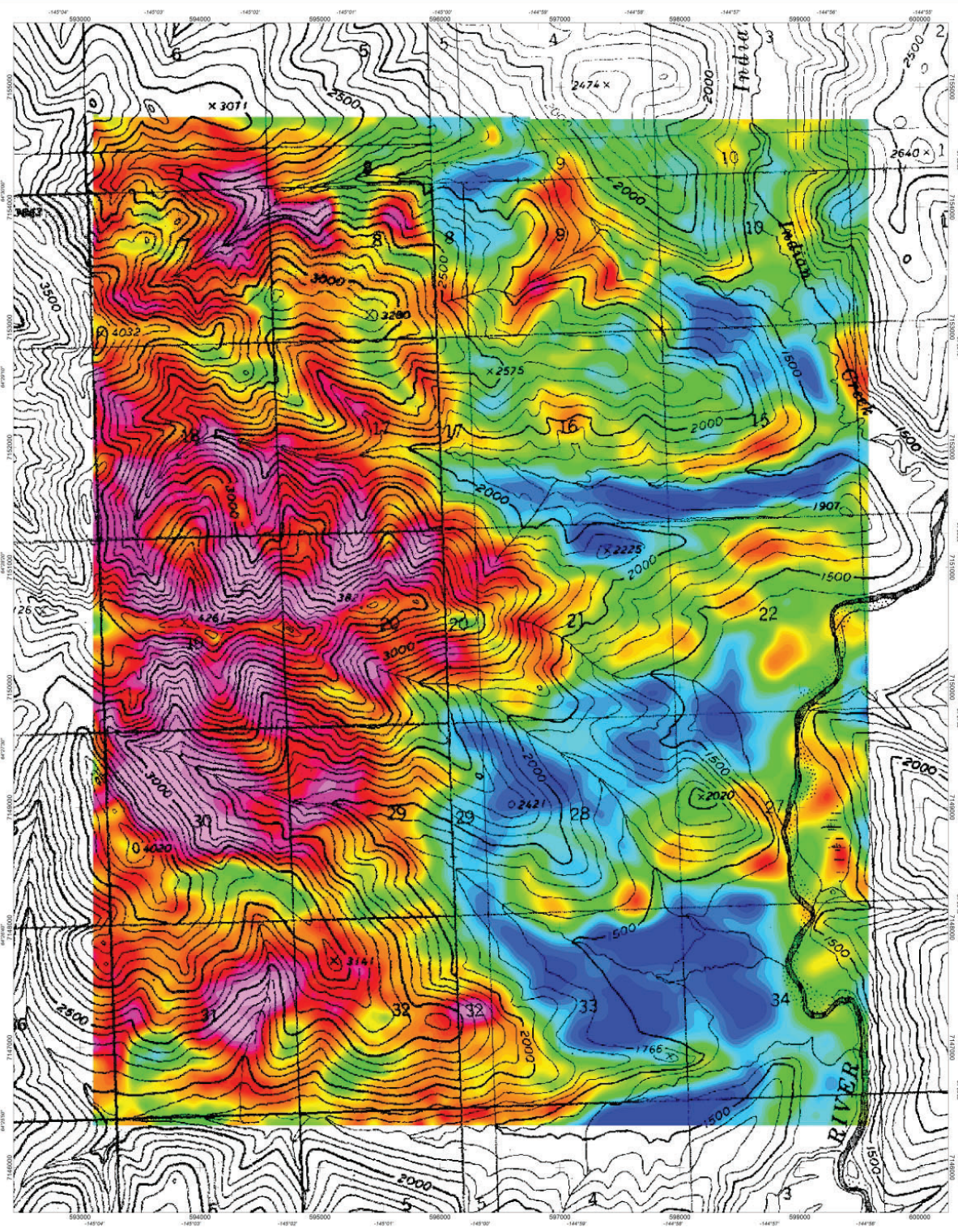
Shaw Creek and Shawnee Peak Airborne Magnetic and Radiometric Geophysical Survey

Calculated 1st Vertical Derivative Map

Echo Block

Geophysical Report 2020-16





**LEGEND**

Survey Date: July, 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

**SURVEY PARAMETERS:**

Mean Terrain Clearance: 80 meters  
Helicopter: 80 meters  
Spectrometer: 80 meters  
Magnetometer: 80 meters

Traverse Line Direction: 0180° (N-S)  
Control Line Direction: 90° (E-W)  
Traverse Line Spacing: 100 m  
Control Line Spacing: 1000 m

**AIRBORNE MAGNETOMETER SYSTEM:**

Scintrex CS - 3 Magnetometer Sensor and Fluxgate Mag. Billingsley  
Configuration: Stinger  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

**AIRBORNE GAMMA-RAY SPECTROMETER:**

RSX-5 multi-channel gamma-ray Spectrometer with 33.6 liters "downward looking" NaI sensor and 8.4 liters "upward looking" NaI sensor.  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

**AIRBORNE NAVIGATION SYSTEM:**

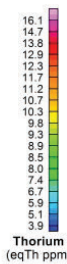
Hemisphere R200 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VIRB

**LASER ALTIMETER:**

Sampling Rate: 10 readings/second

**BASE STATION MAGNETOMETER:**

GEM GSM-19TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.002 nT

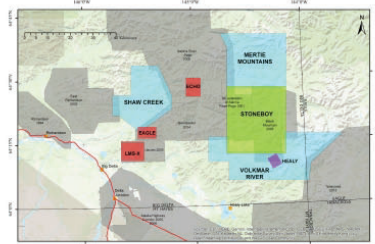


Contours: USGS Topo Map

Relative regional location of survey areas



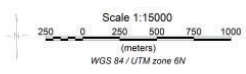
Location of all the blocks collected



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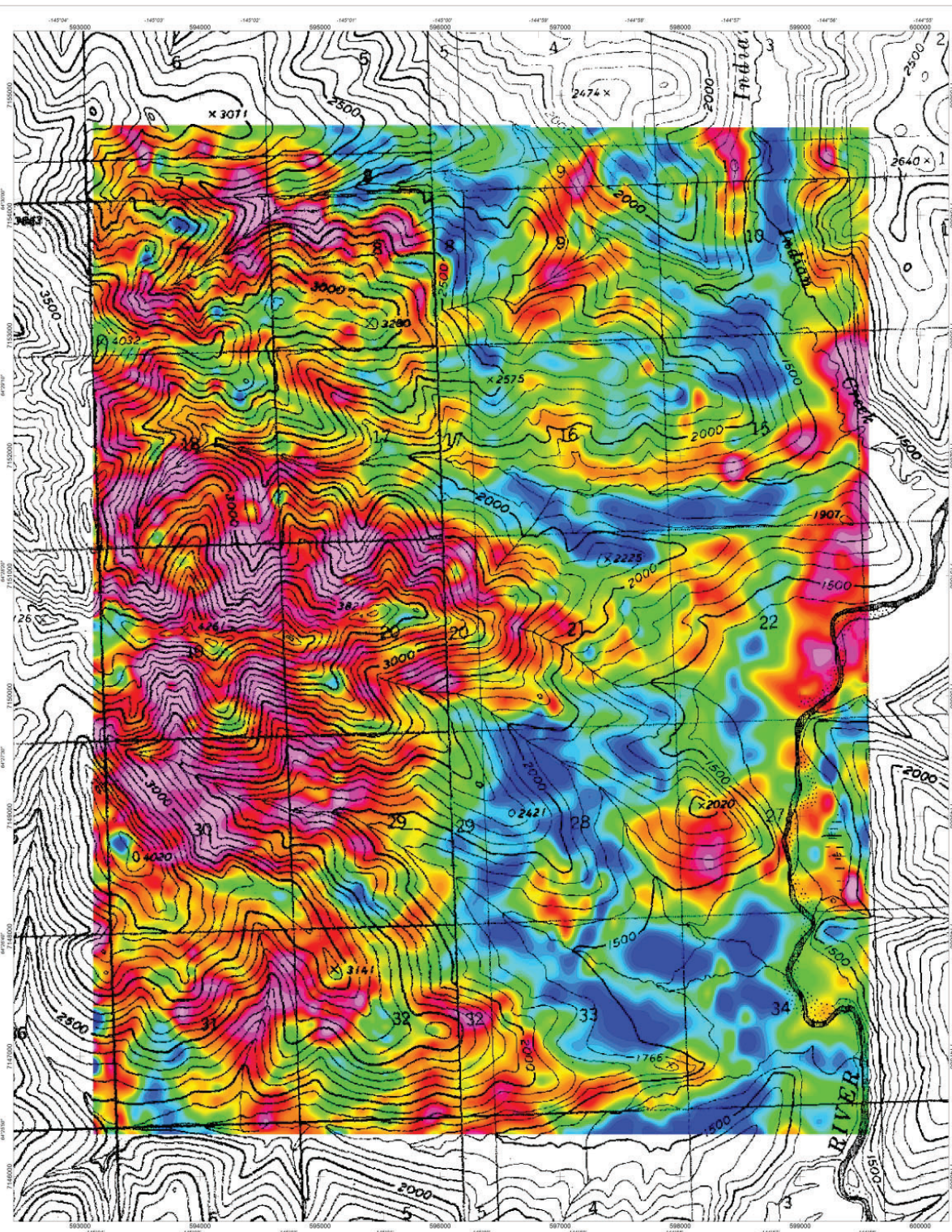
Shaw Creek and Shawnee Peak Airborne Magnetic and Radiometric Geophysical Survey

Thorium Map (eqTh ppm)

Echo Block

Geophysical Report 2020-16





**LEGEND**

Survey Date: July, 2020  
 Helicopter Type: AS350B2  
 Registration: C-GSVY

**SURVEY PARAMETERS:**

Mean Terrain Clearance: 80 meters  
 Helicopter: 80 meters  
 Spectrometer: 80 meters  
 Magnetometer: 80 meters

Traverse Line Direction: 0180° (N-S)  
 Control Line Direction: 90° (E-W)  
 Traverse Line Spacing: 100 m  
 Control Line Spacing: 1000 m

**AIRBORNE MAGNETOMETER SYSTEM:**

Scintrex CS - 3 Magnetometer Sensor and Fluxgate Mag. Billingsley  
 Configuration: Stinger  
 Sampling Rate: 20 readings/second  
 Sensitivity: 0.01 nT

**AIRBORNE GAMMA-RAY SPECTROMETER:**

RSX-5 multi-channel gamma-ray Spectrometer with 33.6 liters "downward looking" NaI sensor and 8.4 liters "upward looking" NaI sensor.  
 Temperature/Humidity - Vaisala  
 Sampling Rate: 1 reading/second

**AIRBORNE NAVIGATION SYSTEM:**

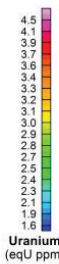
Hemisphere R200 GPS L1/L2  
 Sampling Rate: 5 readings/second  
 Digital Camera Garmin VIRB

**LASER ALTIMETER:**

Sampling Rate: 10 readings/second

**BASE STATION MAGNETOMETER:**

GEM GSM-19TW magnetometer  
 Sampling Rate: 1 reading/second  
 Sensitivity: 0.002 nT

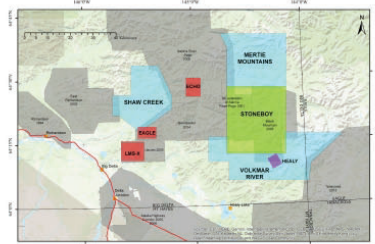


Contours: USGS Topo Map

Relative regional location of survey areas

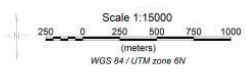


Location of all the blocks collected



ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS  
 Address: 3354 College Rd., Fairbanks, AK 99709, United States of America  
 Phone: +1 907-451-5000  
 Website: <https://dggg.alaska.gov/>

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 Emond, A.M. and MPX Geophysics LTD, 2020, Shaw Creek and Shawnee Peak airborne magnetic and radiometric geophysical survey, Alaska Division of Geological & Geophysical Surveys, Geophysical Report 2020-16, 2 p. <http://doi.org/10.14509/30551>



Alaska Division of Geological & Geophysical Surveys

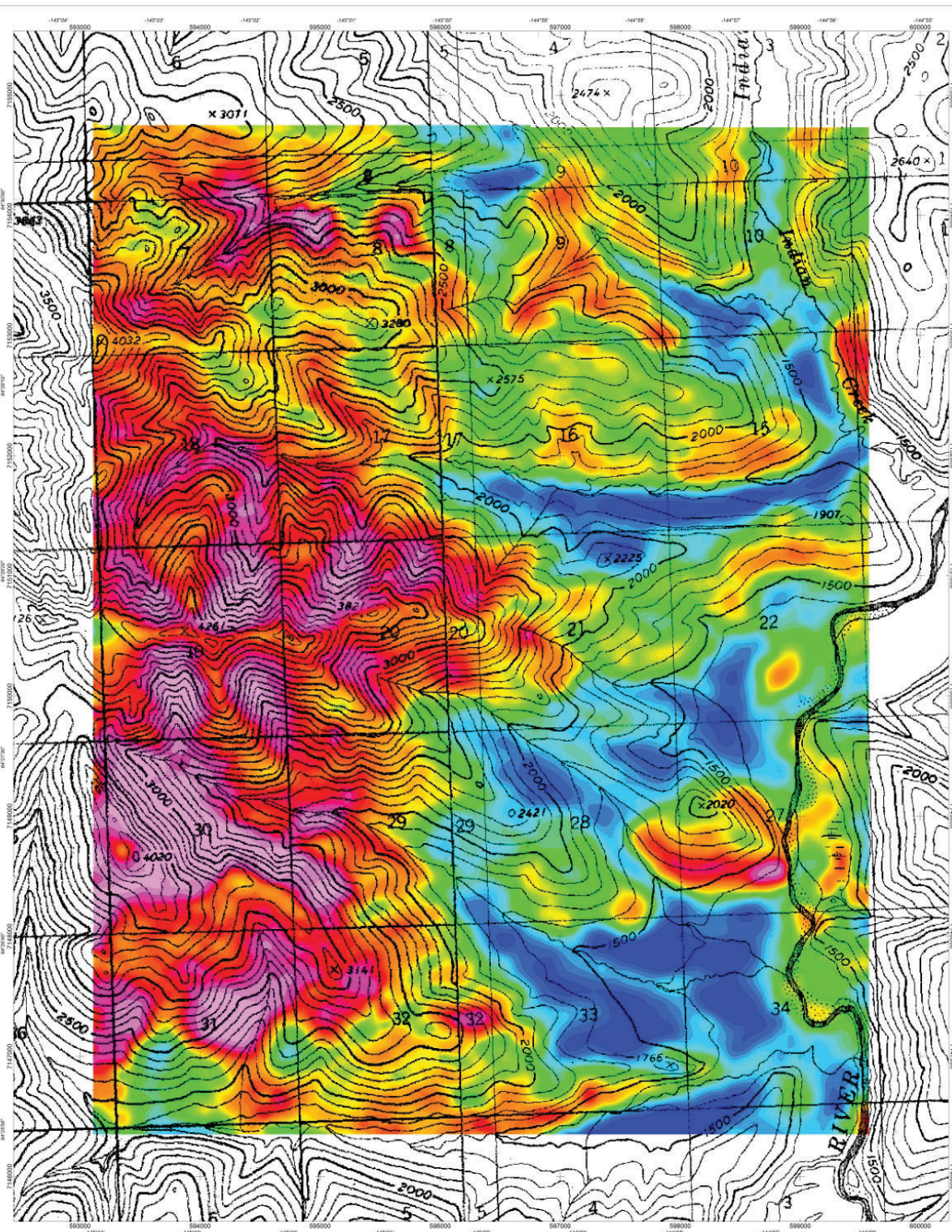
Shaw Creek and Shawnee Peak Airborne Magnetic and Radiometric Geophysical Survey

Uranium Map (eqU ppm)

Echo Block

Geophysical Report 2020-16





#### LEGEND

Survey Date: July, 2020  
 Helicopter Type: AS350B2  
 Registration: C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance: 80 meters  
 Helicopter: 80 meters  
 Spectrometer: 80 meters  
 Magnetometer:  
 Traverse Line Direction: 0180° (N-S)  
 Control Line Direction: 90° (E-W)  
 Traverse Line Spacing: 100 m  
 Control Line Spacing: 1000 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS - 3 Magnetometer Sensor  
 and Fluxgate Mag. Billingsley  
 Configuration: Stinger  
 Sampling Rate: 20 readings/second  
 Sensitivity: 0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel gamma-ray  
 Spectrometer with 33.6 liters "downward looking"  
 NaI sensor and 8.4 liters "upward looking"  
 NaI sensor.  
 Temperature/Humidity - Vaisala  
 Sampling Rate: 1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

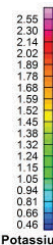
Hemisphere R200 GPS L1/L2  
 Sampling Rate: 5 readings/second  
 Digital Camera Garmin VIRB

#### LASER ALTIMETER:

Sampling Rate: 10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
 Sampling Rate: 1 reading/second  
 Sensitivity: 0.002 nT



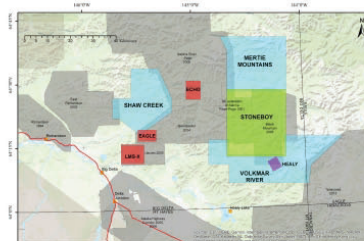
Potassium (K%)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



### Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
 Magnetic and Radiometric Geophysical Survey

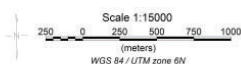
Potassium Map (K%)

Echo Block

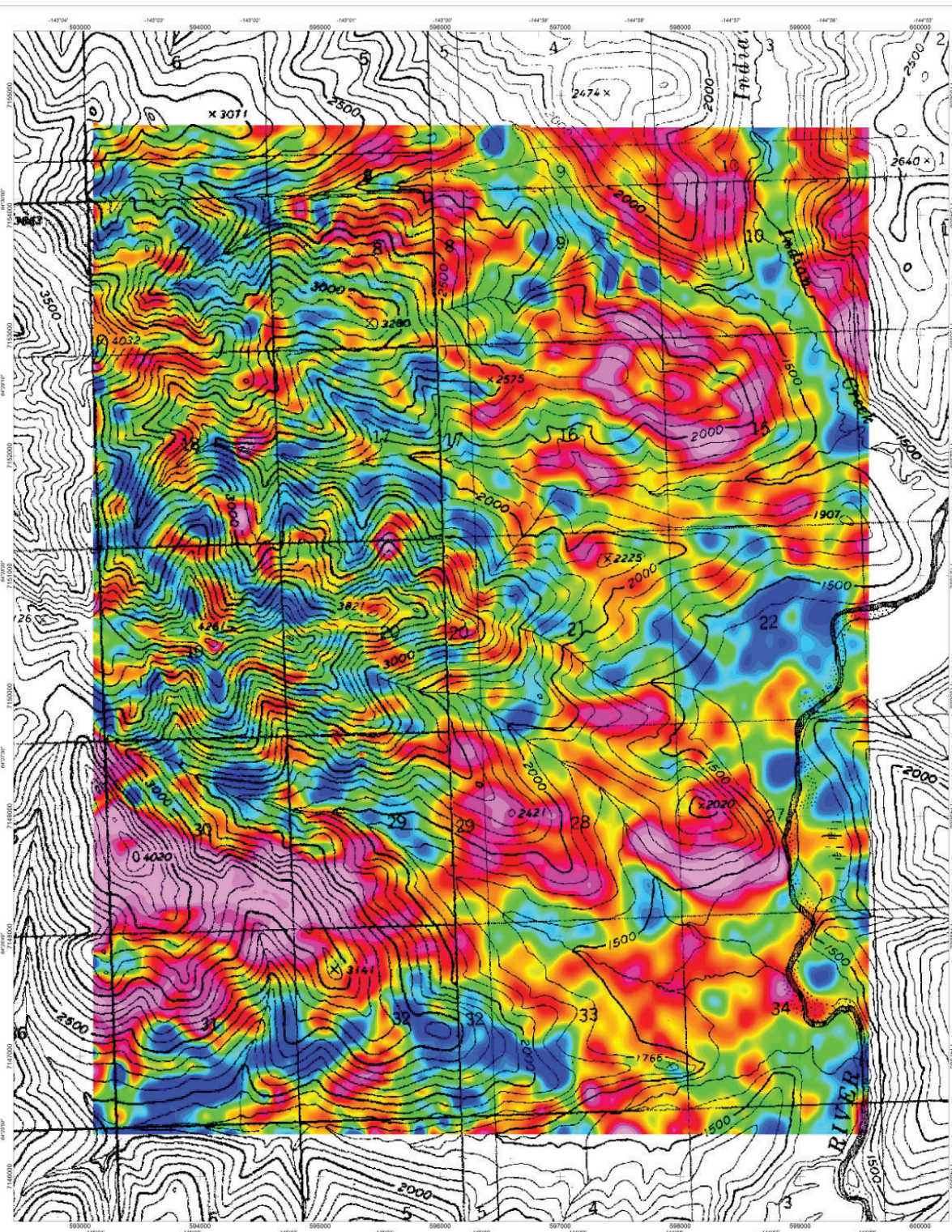
Geophysical Report 2020-16

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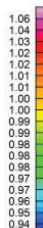






#### LEGEND

Survey Date:	July, 2020
Helicopter Type:	AS350B2
Registration:	C-GSVY
<b>SURVEY PARAMETERS:</b>	
Mean Terrain Clearance:	80 meters
Helicopter:	80 meters
Spectrometer:	80 meters
Magnetometer:	80 meters
Traverse Line Direction:	0180° (N-S)
Control Line Direction:	90° (E-W)
Traverse Line Spacing:	100 m
Control Line Spacing:	1000 m
<b>AIRBORNE MAGNETOMETER SYSTEM:</b>	
Scintrex CS - 3 Magnetometer Sensor and Fluxgate Mag. Billingsley	
Configuration:	Stinger
Sampling Rate:	20 readings/second
Sensitivity:	0.01 nT
<b>AIRBORNE GAMMA-RAY SPECTROMETER:</b>	
RSX-5 multi-channel gamma-ray Spectrometer with 33.6 liters "downward looking" NaI sensor and 8.4 liters "upward looking" NaI sensor.	
Temperature/Humidity - Vaisala	
Sampling Rate:	1 reading/second
<b>AIRBORNE NAVIGATION SYSTEM:</b>	
Hemisphere R200 GPS L1/L2	
Sampling Rate:	5 reading/second
Digital Camera Garmin VIRB	
<b>LASER ALTIMETER:</b>	
Sampling Rate:	10 readings/second
<b>BASE STATION MAGNETOMETER:</b>	
GEM GSM-19TW magnetometer	
Sampling Rate:	1 reading/second
Sensitivity:	0.002 nT



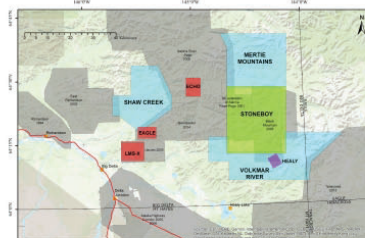
Ratio Potassium / Thorium  
(K% / eqTh ppm)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



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Scale 1:15000  
250 0 250 500 750 1000  
(meters)  
WGS 84 / UTM zone 6N

Alaska Division of Geological & Geophysical Surveys

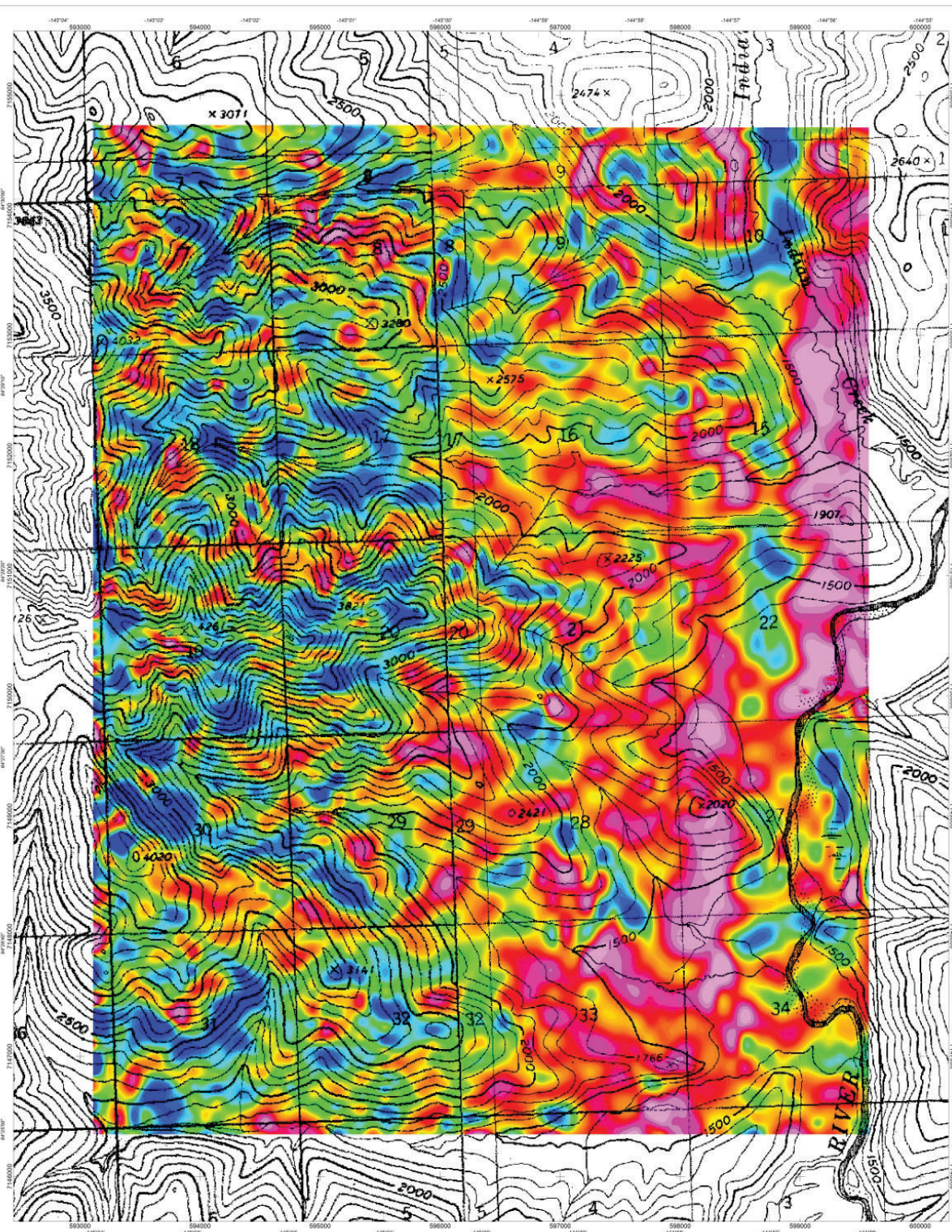
Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Ratio Potassium/Thorium Map (K/eqTh)

Echo Block

Geophysical Report 2020-16





# LEGEND

Survey Date: July, 2020  
 Helicopter Type: AS350B2  
 Registration: C-GSVY

## SURVEY PARAMETERS:

Mean Terrain Clearance: 80 meters  
 Helicopter: 80 meters  
 Spectrometer: 80 meters  
 Magnetometer:  
 Traverse Line Direction: 0180° (N-S)  
 Control Line Direction: 90° (E-W)  
 Traverse Line Spacing: 100 m  
 Control Line Spacing: 1000 m

## AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS - 3 Magnetometer Sensor  
 and Fluxgate Mag. Billingsley  
 Configuration: Stinger  
 Sampling Rate: 20 readings/second  
 Sensitivity: 0.01 nT

## AIRBORNE GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel gamma-ray  
 Spectrometer with 33.6 liters "downward looking"  
 NaI sensor and 8.4 liters "upward looking"  
 NaI sensor.  
 Temperature/Humidity - Vaisala  
 Sampling Rate: 1 reading/second

## AIRBORNE NAVIGATION SYSTEM:

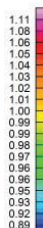
Hemisphere R200 GPS L1/L2  
 Sampling Rate: 5 readings/second  
 Digital Camera Garmin VIRB

## LASER ALTIMETER:

Sampling Rate: 10 readings/second

## BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
 Sampling Rate: 1 reading/second  
 Sensitivity: 0.002 nT

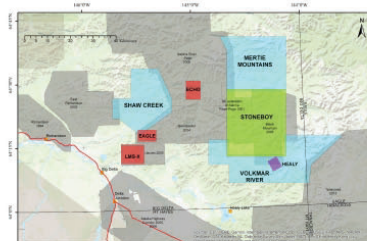


Ratio Uranium / Thorium  
 (eqU ppm / eqTh ppm)  
 Contours: USGS Topo Map

## Relative regional location of survey areas



## Location of all the blocks collected



## Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
 Magnetic and Radiometric Geophysical Survey

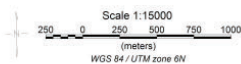
Ratio Uranium/Thorium Map (eqU/eqTh)

Echo Block

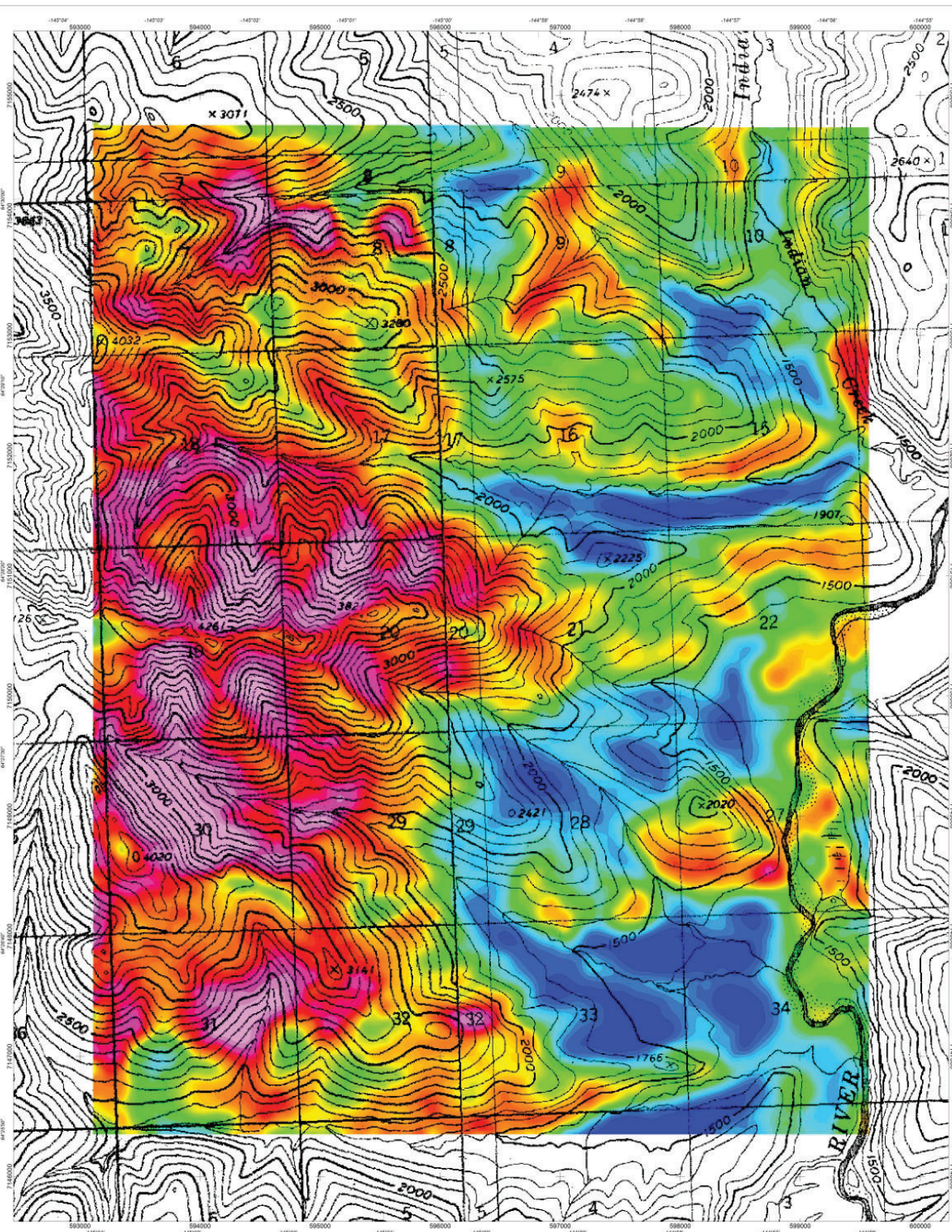
Geophysical Report 2020-16

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#### LEGEND

Survey Date: July, 2020  
 Helicopter Type: AS350B2  
 Registration: C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance: 80 meters  
 Helicopter: 80 meters  
 Spectrometer: 80 meters  
 Magnetometer:  
 Traverse Line Direction: 0180° (N-S)  
 Control Line Direction: 90° (E-W)  
 Traverse Line Spacing: 100 m  
 Control Line Spacing: 1000 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS-3 Magnetometer Sensor  
 and Fluxgate Mag. Billingsley  
 Configuration: Stinger  
 Sampling Rate: 20 readings/second  
 Sensitivity: 0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel gamma-ray  
 Spectrometer with 33.6 liters "downward looking"  
 NaI sensor and 8.4 liters "upward looking"  
 NaI sensor.  
 Temperature/Humidity - Vaisala  
 Sampling Rate: 1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

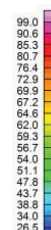
Hemisphere R200 GPS L1/L2  
 Sampling Rate: 5 readings/second  
 Digital Camera Garmin VIRB

#### LASER ALTIMETER:

Sampling Rate: 10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
 Sampling Rate: 1 reading/second  
 Sensitivity: 0.002 nT



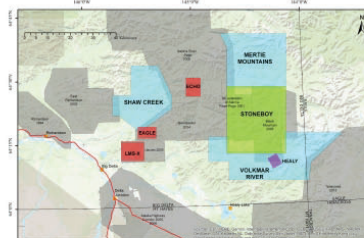
Total Air Absorbed Dose Rate  
 (nGy/h)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



### Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
 Magnetic and Radiometric Geophysical Survey

Total Air Absorbed Dose Rate Map (Taadr)

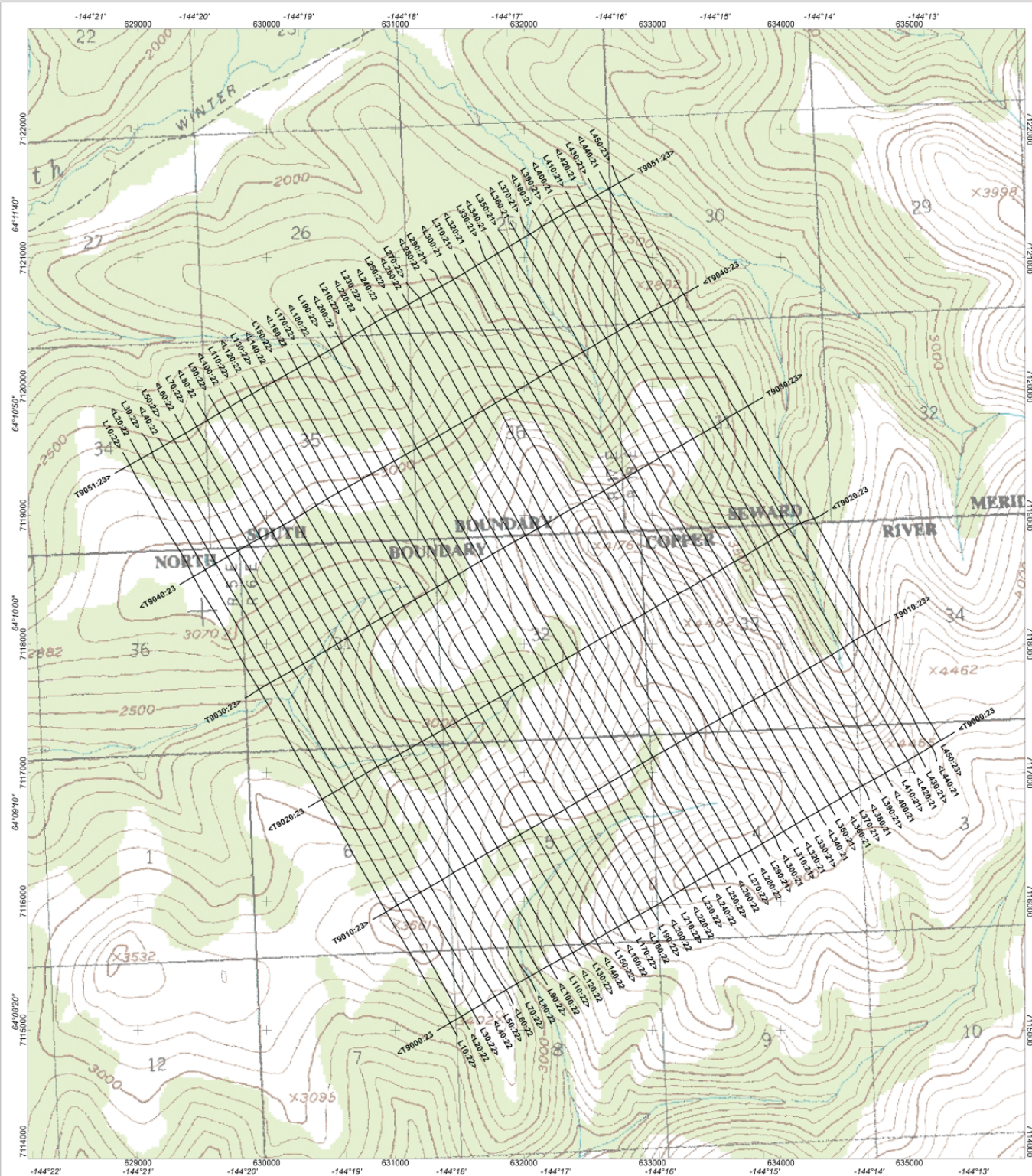
Echo Block

Geophysical Report 2020-16









#### LEGEND

Survey Date: July 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance: 80 meters  
Helicopter: 80 meters  
Spectrometer: 80 meters  
Magnetometer: 80 meters  
Traverse Line Direction: 150° (N30°W)  
Control Line Direction: 60° (N60°E)  
Traverse Line Spacing: 100 m  
Control Line Spacing: 1000 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS-3 Magnetometer Sensor and Fluxgate Mag. Billingsley  
Configuration: Stinger  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel gamma-ray Spectrometer with 33.6 liters "downward looking" NaI sensor and 8.4 liters "upward looking" NaI sensor.  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VIRB

#### LASER ALTIMETER:

Sampling Rate: 10 readings/second

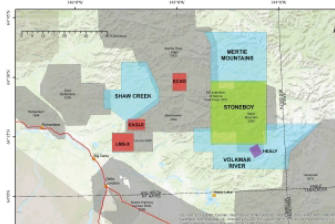
#### BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT

#### Relative regional location of survey areas



#### Location of all the blocks collected



#### Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne Magnetic and Radiometric Geophysical Survey

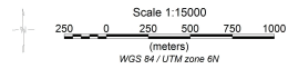
Flown Flight Path over USGS Topo Map

Healy Block

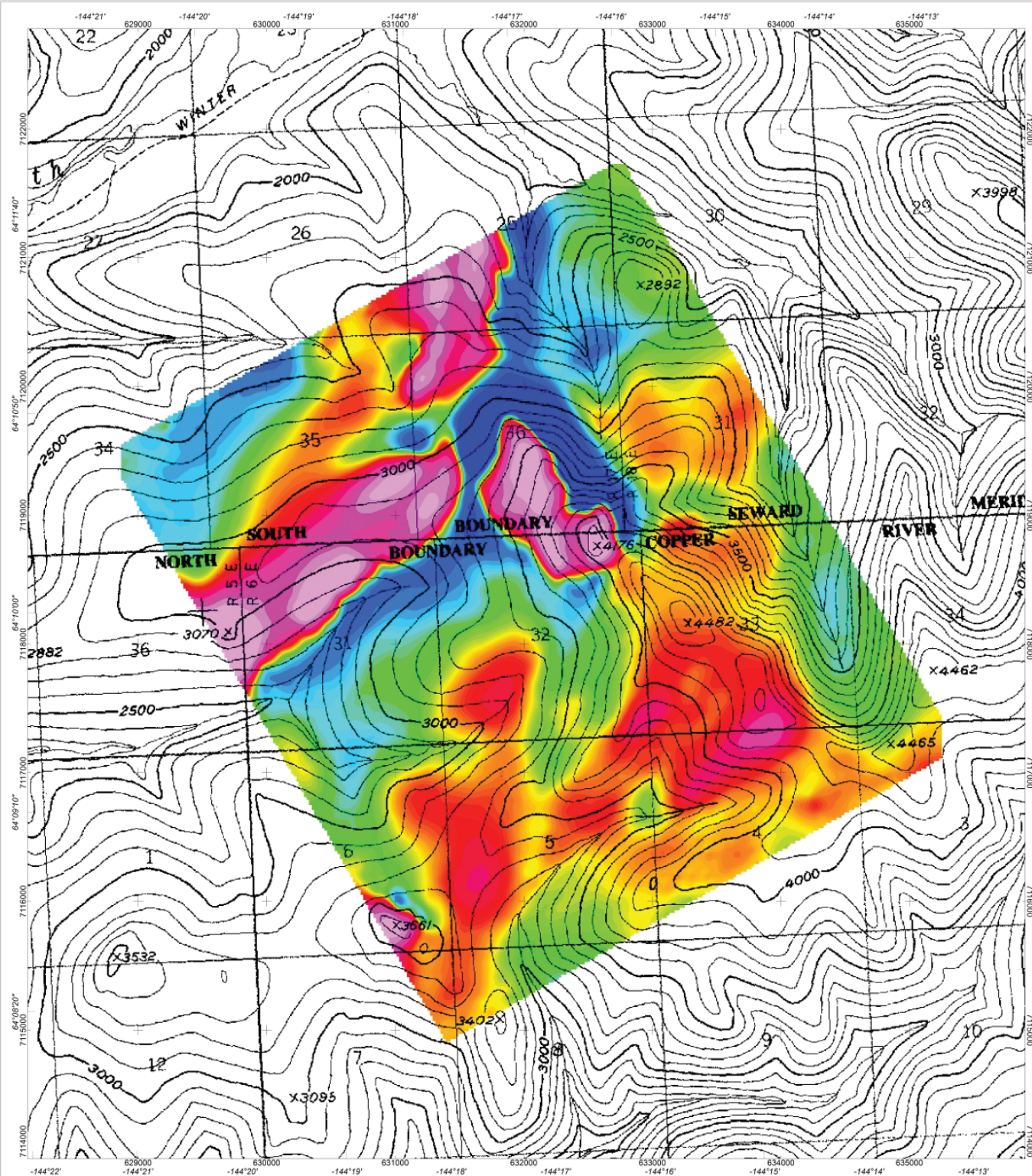
Geophysical Report 2020-16

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# LEGEND

Survey Date: July 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

## SURVEY PARAMETERS:

Mean Terrain Clearance: 80 meters  
Helicopter: 80 meters  
Spectrometer: 80 meters  
Magnetometer: 80 meters  
Traverse Line Direction: 150° (N30°W)  
Control Line Direction: 60° (N60°E)  
Traverse Line Spacing: 100 m  
Control Line Spacing: 1000 m

## AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS-3 Magnetometer Sensor and Fluxgate Mag. Billingsley  
Configuration: Stinger  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

## AIRBORNE GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel gamma-ray Spectrometer with 33.6 liters "downward looking" NaI sensor and 8.4 liters "upward looking" NaI sensor.  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

## AIRBORNE NAVIGATION SYSTEM:

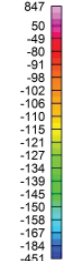
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VIRB

## LASER ALTIMETER:

Sampling Rate: 10 readings/second

## BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT



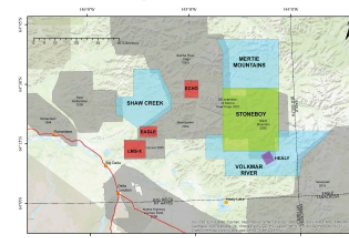
## Residual Magnetic Intensity (nT)

Contours: USGS Topo Map

## Relative regional location of survey areas



## Location of all the blocks collected



## Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne Magnetic and Radiometric Geophysical Survey

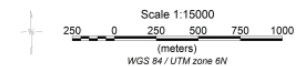
## Residual Magnetic Intensity Map

Healy Block

Geophysical Report 2020-16

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#### LEGEND

Survey Date: July 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance: 80 meters  
Helicopter: 80 meters  
Spectrometer: 80 meters  
Magnetometer: 80 meters  
Traverse Line Direction: 150° (N30°W)  
Control Line Direction: 60° (N60°E)  
Traverse Line Spacing: 100 m  
Control Line Spacing: 1000 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS-3 Magnetometer Sensor  
and Fluxgate Mag. Billingsley  
Configuration: Stinger  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel gamma-ray  
Spectrometer with 33.6 liters "downward looking"  
NaI sensor and 8.4 liters "upward looking"  
NaI sensor.  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

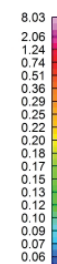
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VIRB

#### LASER ALTIMETER:

Sampling Rate: 10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT



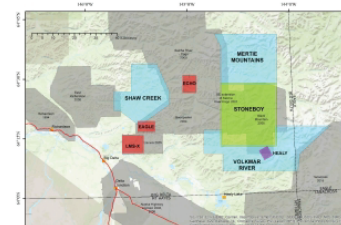
Analytic Signal  
(nT/m)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



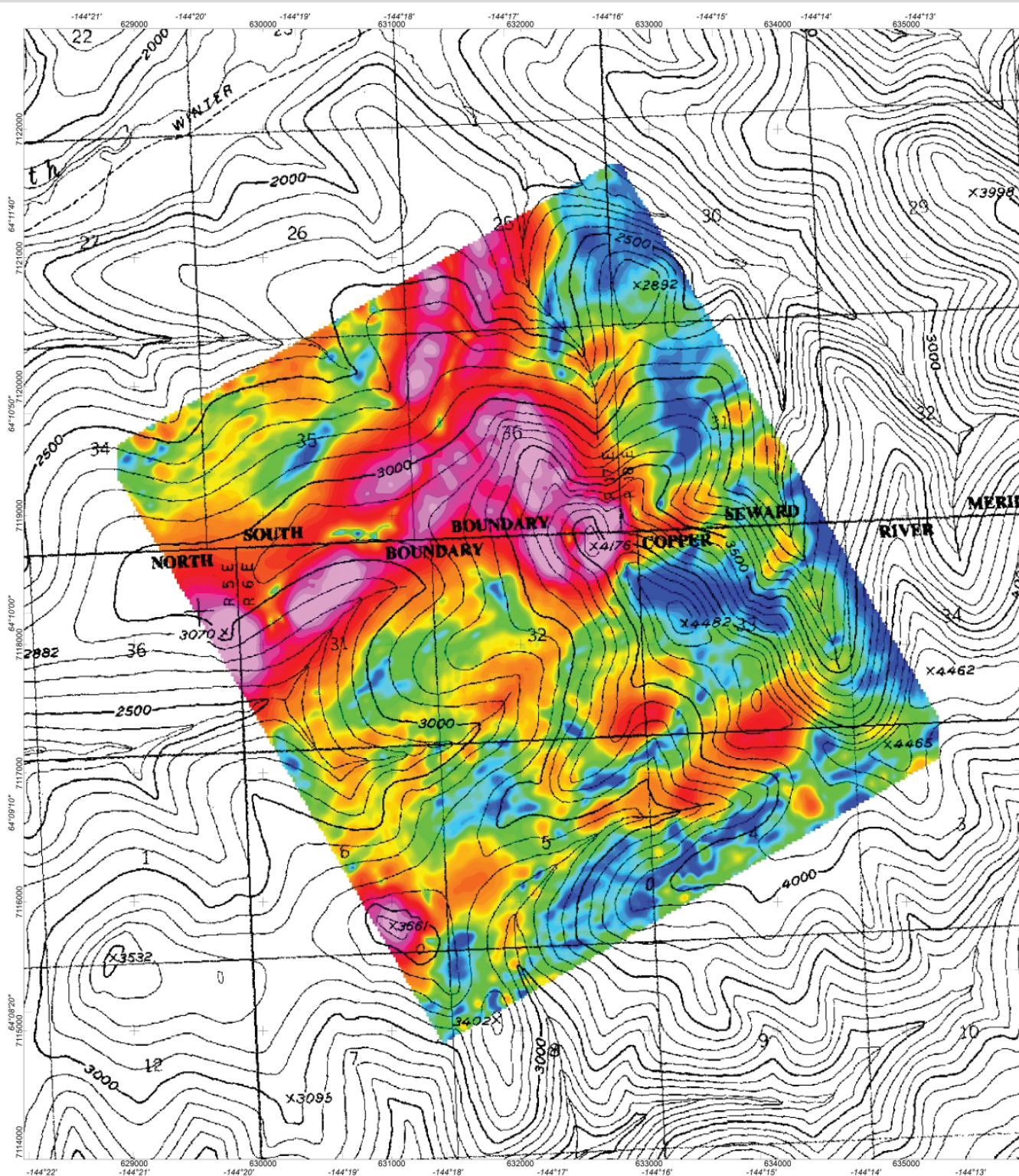
Alaska Division of Geological &  
Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Analytic Signal Map

Healy Block

Geophysical Report 2020-16







#### LEGEND

Survey Date: July 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance: 80 meters  
Helicopter: 80 meters  
Spectrometer: 80 meters  
Magnetometer: 80 meters  
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Control Line Direction: 60° (N60°E)  
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#### AIRBORNE MAGNETOMETER SYSTEM:

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Configuration: Stinger  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

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Spectrometer with 33.6 liters "downward looking"  
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NaI sensor.  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

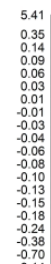
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VIRB

#### LASER ALTIMETER:

Sampling Rate: 10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT



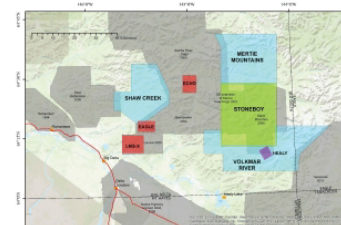
Calculated 1st Vertical Derivative  
(nT/m)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



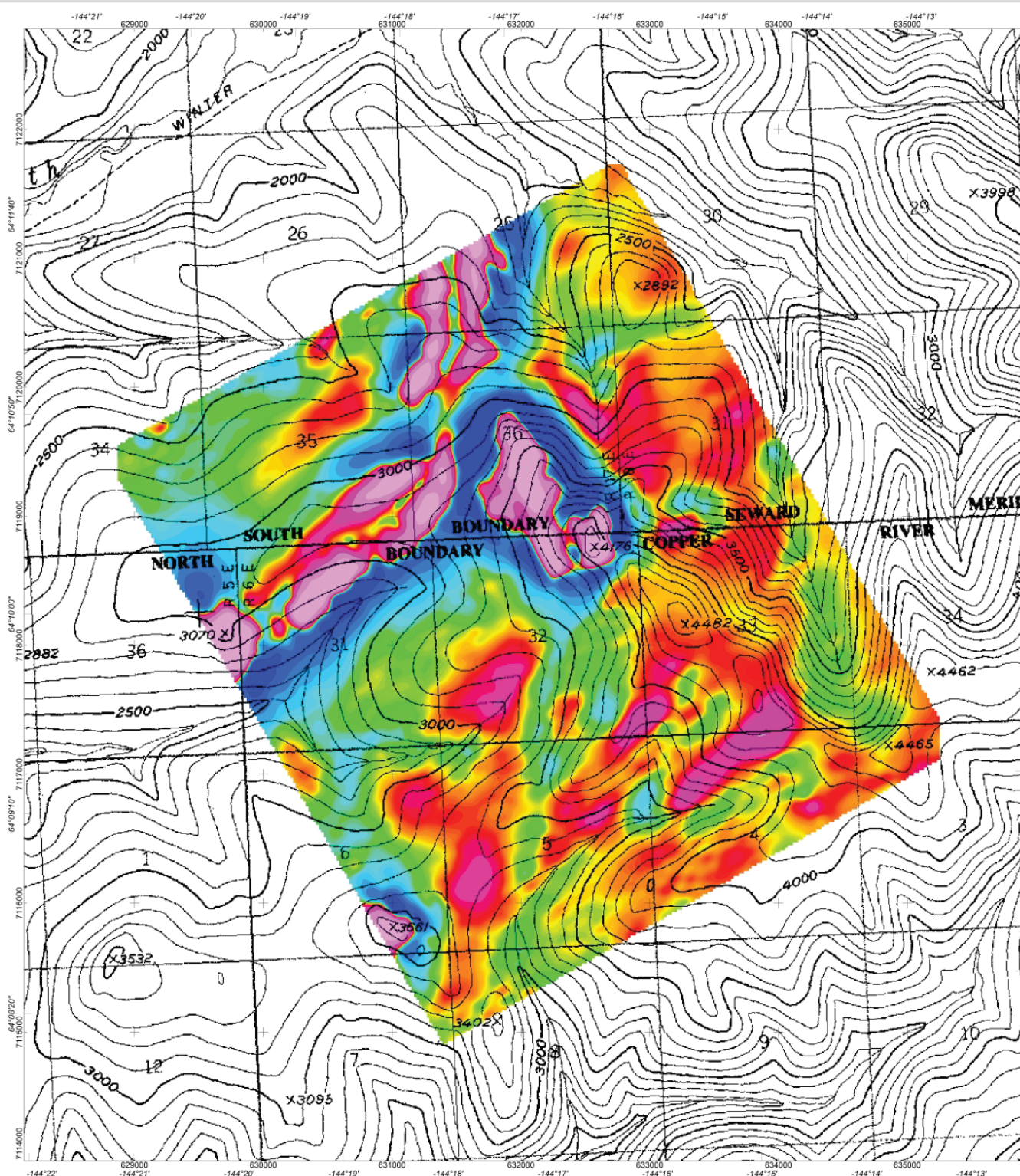
Alaska Division of Geological &  
Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Calculated 1st Vertical Derivative Map

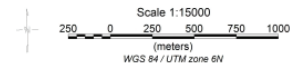
Healy Block

Geophysical Report 2020-16



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#### LEGEND

Survey Date: July 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance: 80 meters  
Helicopter: 80 meters  
Spectrometer: 80 meters  
Magnetometer: 80 meters  
Traverse Line Direction: 150° (N30°W)  
Control Line Direction: 60° (N60°E)  
Traverse Line Spacing: 100 m  
Control Line Spacing: 1000 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS-3 Magnetometer Sensor  
and Fluxgate Mag. Billingsley  
Configuration: Stinger  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel gamma-ray  
Spectrometer with 33.6 liters "downward looking"  
NaI sensor and 8.4 liters "upward looking"  
NaI sensor.  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

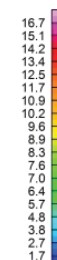
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VIRB

#### LASER ALTIMETER:

Sampling Rate: 10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT



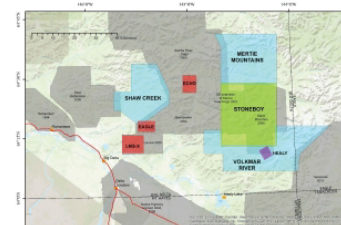
Thorium  
(eqTh ppm)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



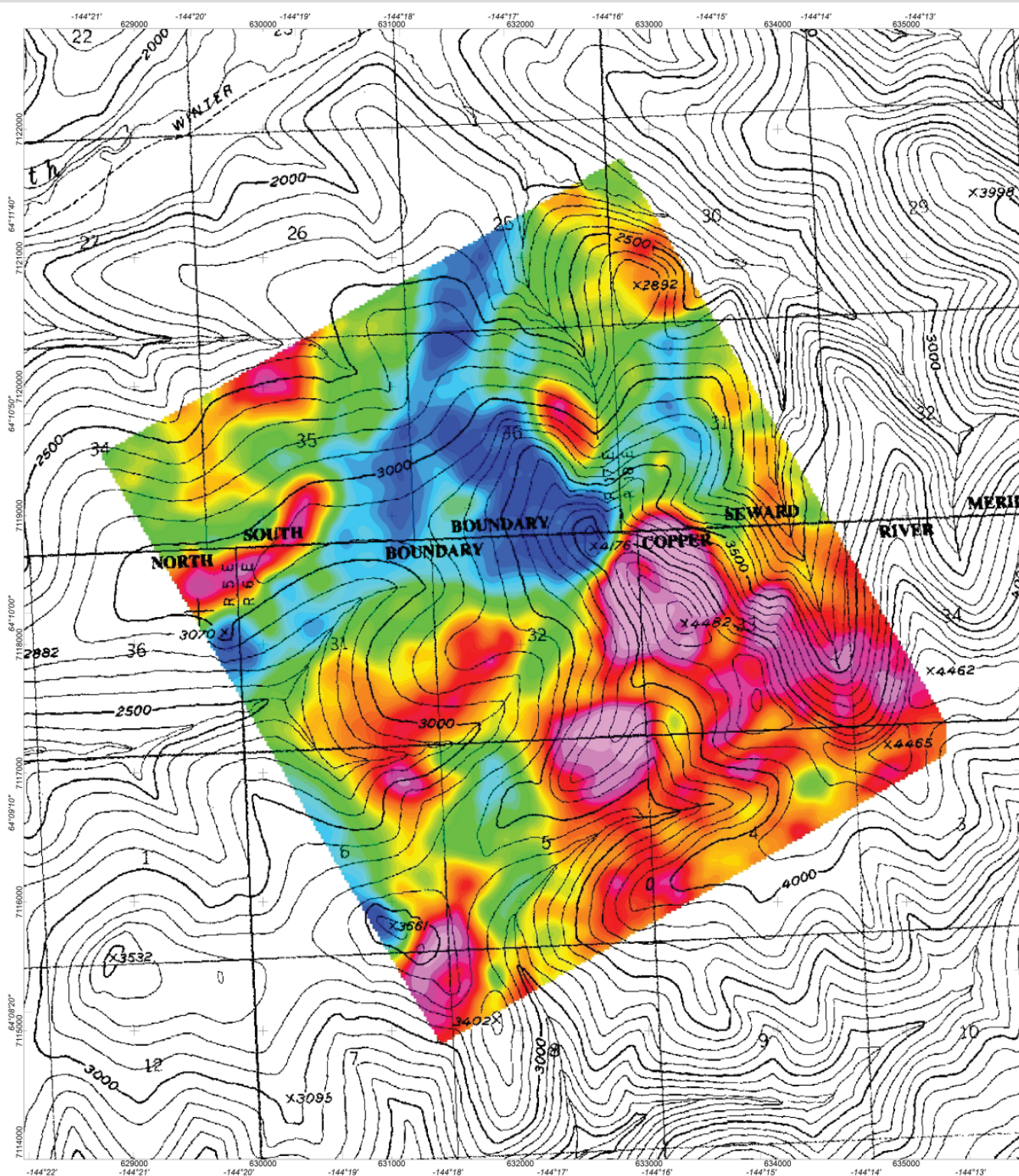
#### Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

#### Thorium Map (eqTh ppm)

Healy Block

Geophysical Report 2020-16



ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS  
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Emond, A.M., and MPX Geophysics LTD. 2020, Shaw Creek and Shawnee Peak airborne magnetic and radiometric geophysical survey: Alaska Division of Geological & Geophysical Surveys, Geophysical Report 2020-16, 2 p. <http://doi.org/10.14509/30551>

Scale 1:15000  
250 0 250 500 750 1000  
(meters)  
WGS 84 / UTM zone 6N





#### LEGEND

Survey Date: July 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance: 80 meters  
Helicopter: 80 meters  
Spectrometer: 80 meters  
Magnetometer: 80 meters  
Traverse Line Direction: 150° (N30°W)  
Control Line Direction: 60° (N60°E)  
Traverse Line Spacing: 100 m  
Control Line Spacing: 1000 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS-3 Magnetometer Sensor  
and Fluxgate Mag. Billingsley  
Configuration: Stinger  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel gamma-ray  
Spectrometer with 33.6 liters "downward looking"  
NaI sensor and 8.4 liters "upward looking"  
NaI sensor.  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

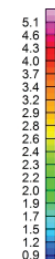
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VIRB

#### LASER ALTIMETER:

Sampling Rate: 10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT



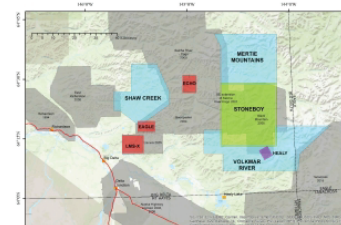
Uranium  
(eqU ppm)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



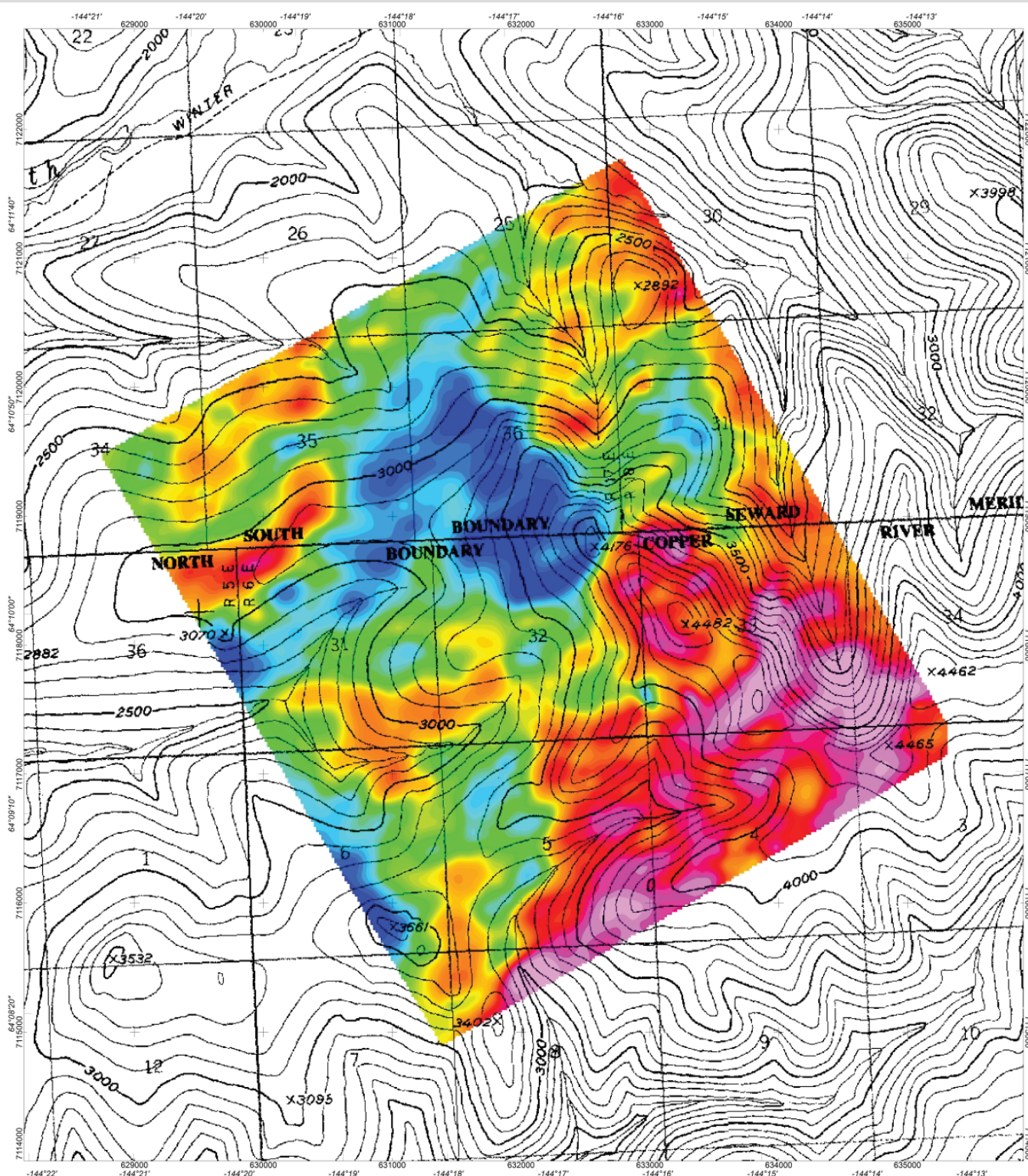
#### Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

#### Uranium Map (eqU ppm)

Healy Block

Geophysical Report 2020-16







#### LEGEND

Survey Date: July 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance: 80 meters  
Helicopter: 80 meters  
Spectrometer: 80 meters  
Magnetometer: 80 meters  
Traverse Line Direction: 150° (N30°W)  
Control Line Direction: 60° (N60°E)  
Traverse Line Spacing: 100 m  
Control Line Spacing: 1000 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS-3 Magnetometer Sensor  
and Fluxgate Mag. Billingsley  
Configuration: Stinger  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel gamma-ray  
Spectrometer with 33.6 liters "downward looking"  
NaI sensor and 8.4 liters "upward looking"  
NaI sensor.  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

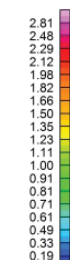
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VIRB

#### LASER ALTIMETER:

Sampling Rate: 10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT



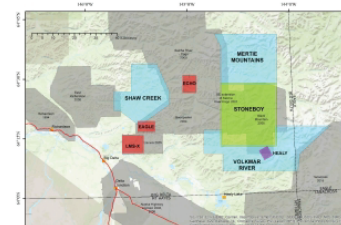
Potassium  
(K%)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



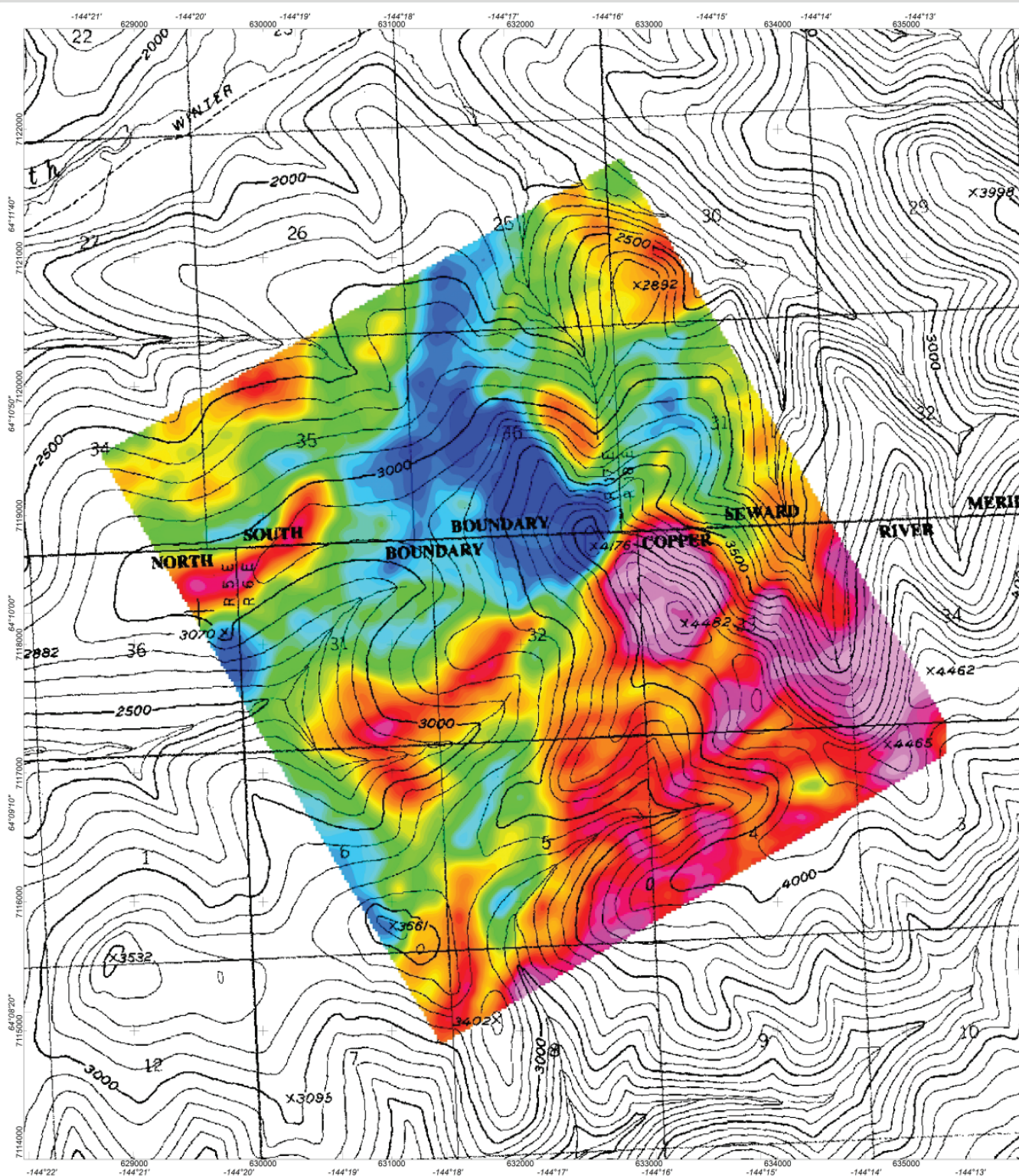
### Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

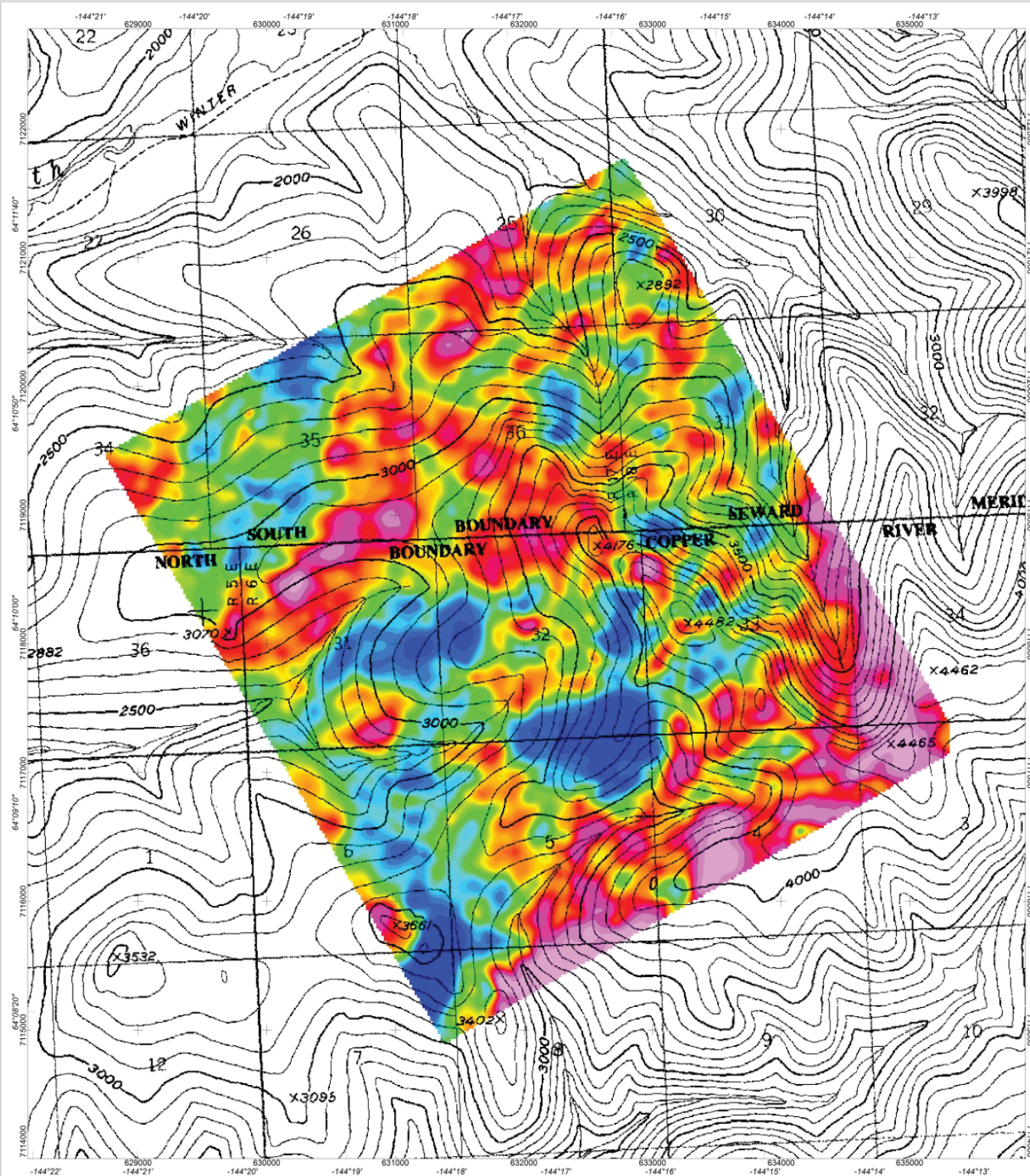
## Potassium Map (K%)

Healy Block

Geophysical Report 2020-16







#### LEGEND

Survey Date: July 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance: 80 meters  
Helicopter: 80 meters  
Spectrometer: 80 meters  
Magnetometer: 80 meters  
Traverse Line Direction: 150° (N30°W)  
Control Line Direction: 60° (N60°E)  
Traverse Line Spacing: 100 m  
Control Line Spacing: 1000 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS-3 Magnetometer Sensor and Fluxgate Mag. Billingsley  
Configuration: Stinger  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel gamma-ray Spectrometer with 33.6 liters "downward looking" NaI sensor and 8.4 liters "upward looking" NaI sensor.  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VIRB

#### LASER ALTIMETER:

Sampling Rate: 10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT



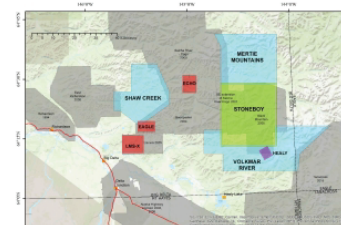
Ratio Potassium / Thorium  
(K% / eqTh ppm)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Ratio Potassium/Thorium Map (K/eTh)

Healy Block

Geophysical Report 2020-16





#### LEGEND

Survey Date: July 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance: 80 meters  
Helicopter: 80 meters  
Spectrometer: 80 meters  
Magnetometer: 80 meters  
Traverse Line Direction: 150° (N30°W)  
Control Line Direction: 60° (N60°E)  
Traverse Line Spacing: 100 m  
Control Line Spacing: 1000 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS-3 Magnetometer Sensor  
and Fluxgate Mag. Billingsley  
Configuration: Stinger  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel gamma-ray  
Spectrometer with 33.6 liters "downward looking"  
NaI sensor and 8.4 liters "upward looking"  
NaI sensor.  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

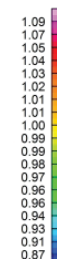
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VIRB

#### LASER ALTIMETER:

Sampling Rate: 10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT

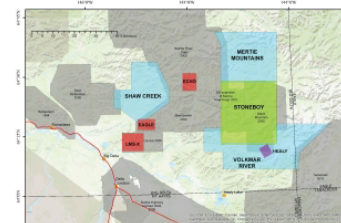


Ratio Uranium / Thorium  
(eqU ppm / eqTh ppm)  
Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



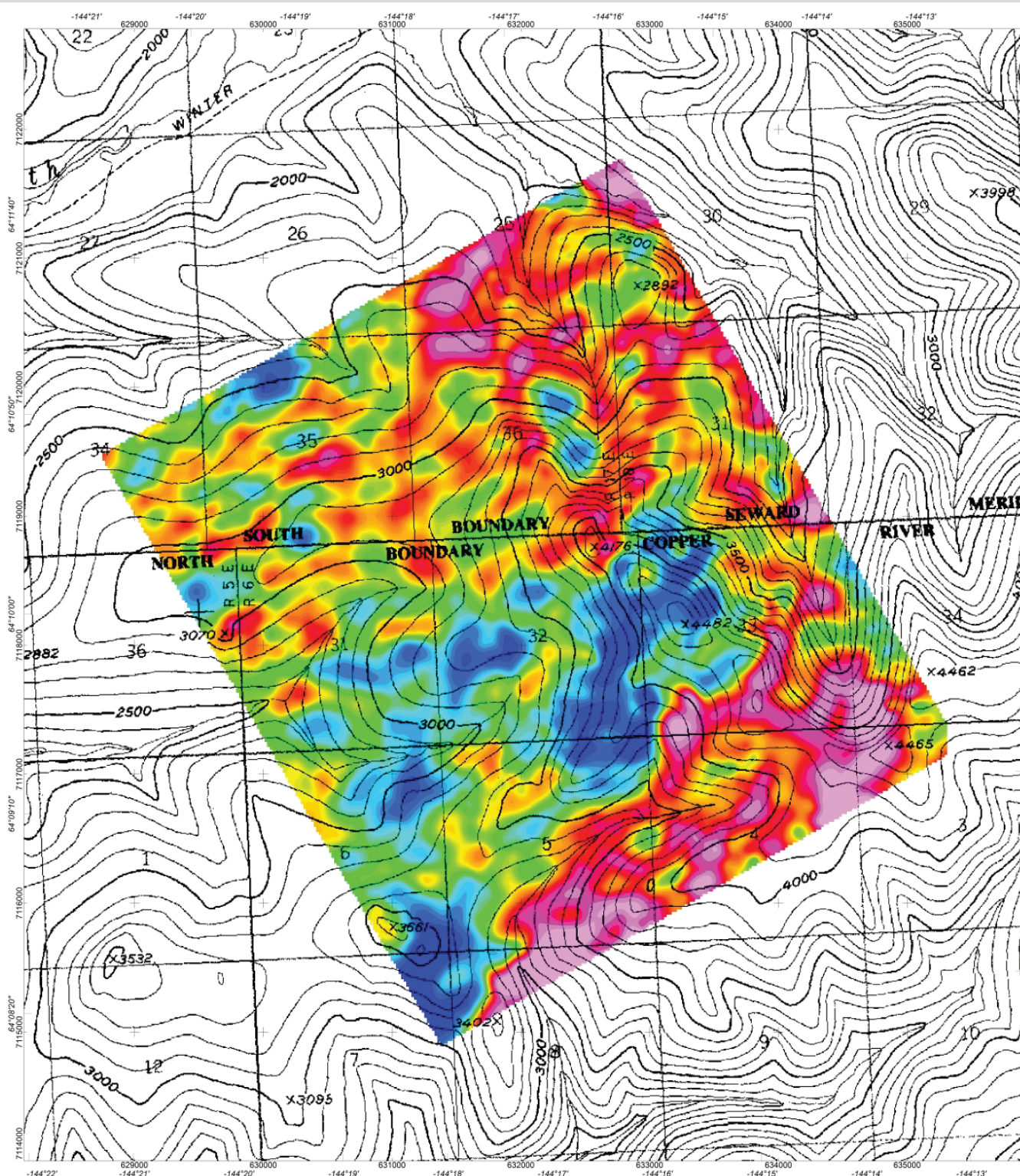
Alaska Division of Geological &  
Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Ratio Uranium/Thorium Map (eqU/eqTh)

Healy Block

Geophysical Report 2020-16



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Scale 1:15000  
250 0 250 500 750 1000  
(meters)  
WGS 84 / UTM zone 6N





#### LEGEND

Survey Date: July 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance: 80 meters  
Helicopter: 80 meters  
Spectrometer: 80 meters  
Magnetometer: 80 meters  
Traverse Line Direction: 150° (N30°W)  
Control Line Direction: 60° (N60°E)  
Traverse Line Spacing: 100 m  
Control Line Spacing: 1000 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS-3 Magnetometer Sensor  
and Fluxgate Mag. Billingsley  
Configuration: Stinger  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel gamma-ray  
Spectrometer with 33.6 liters "downward looking"  
NaI sensor and 8.4 liters "upward looking"  
NaI sensor.  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

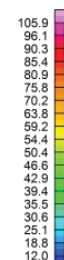
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VIRB

#### LASER ALTIMETER:

Sampling Rate: 10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT



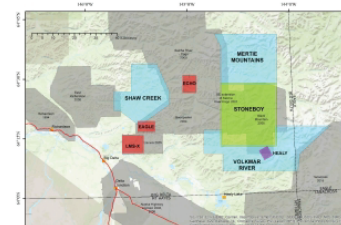
Total Air Absorbed Dose Rate  
(nGy/h)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



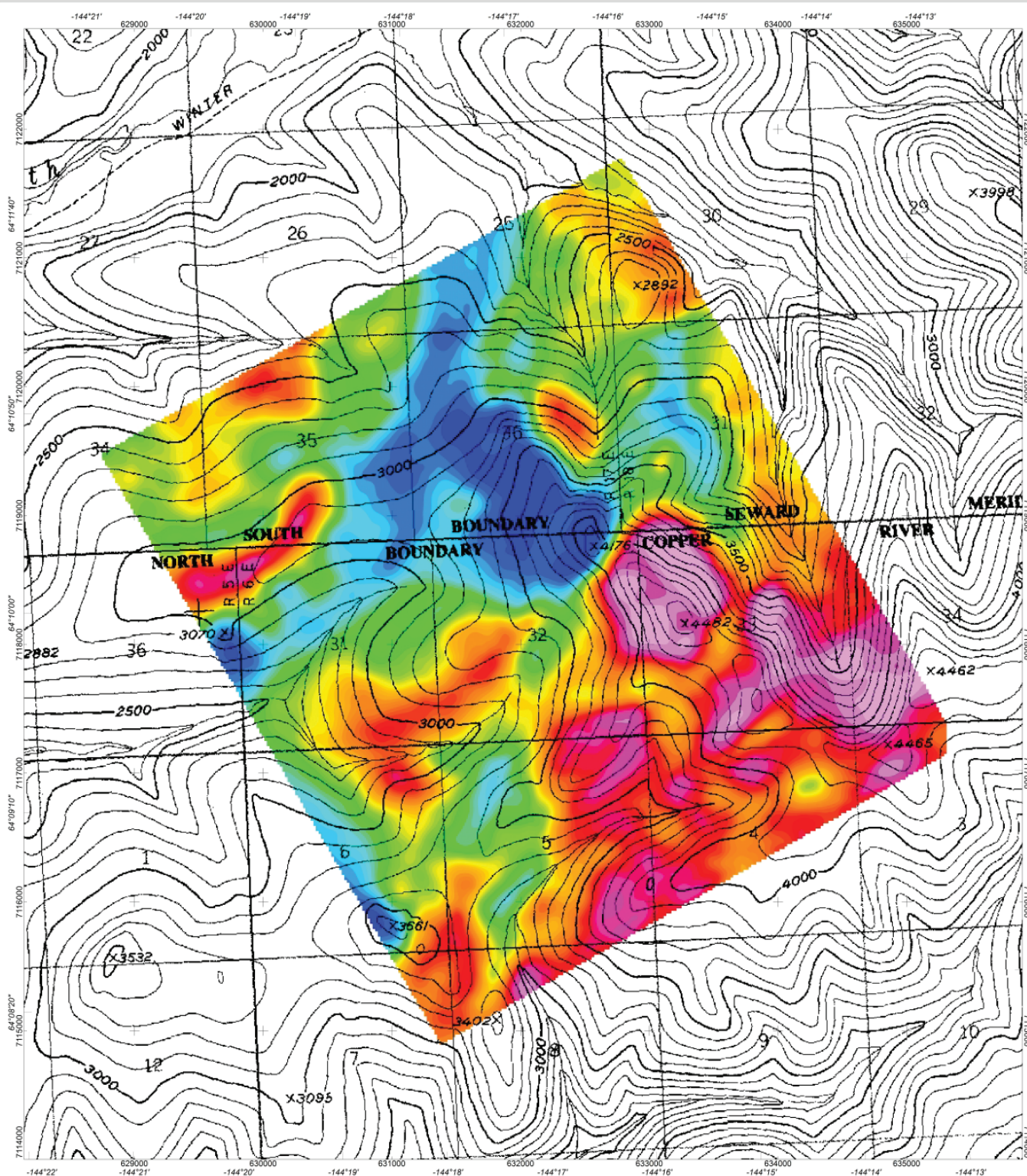
#### Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Total Air Absorbed Dose  
Rate Map (Taadr)

Healy Block

Geophysical Report 2020-16







#### LEGEND

Survey Date: July 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance: 80 meters  
Helicopter: 80 meters  
Spectrometer: 80 meters  
Magnetometer: 80 meters  
Traverse Line Direction: 150° (N30°W)  
Control Line Direction: 60° (N60°E)  
Traverse Line Spacing: 100 m  
Control Line Spacing: 1000 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS-3 Magnetometer Sensor and Fluxgate Mag. Billingsley  
Configuration: Stinger  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel gamma-ray Spectrometer with 33.6 liters "downward looking" NaI sensor and 8.4 liters "upward looking" NaI sensor.  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

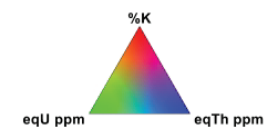
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VIRB

#### LASER ALTIMETER:

Sampling Rate: 10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT

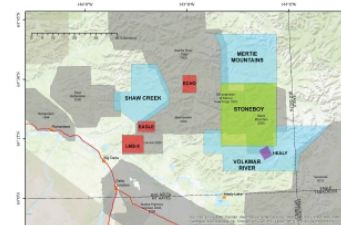


Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



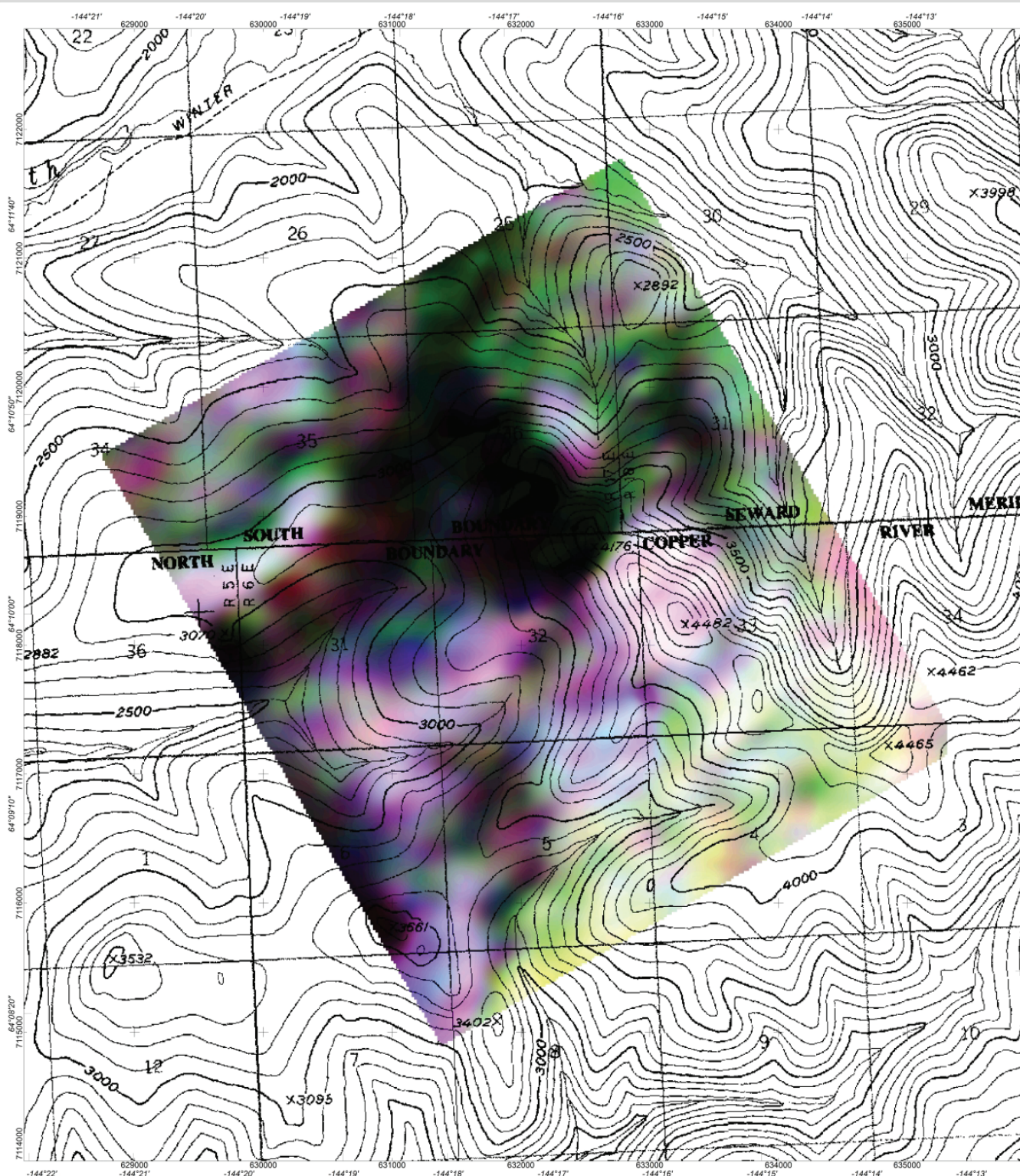
#### Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Ternary Map (%K - eqU ppm - eqTh ppm)

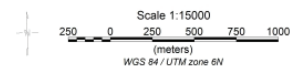
Healy Block

Geophysical Report 2020-16

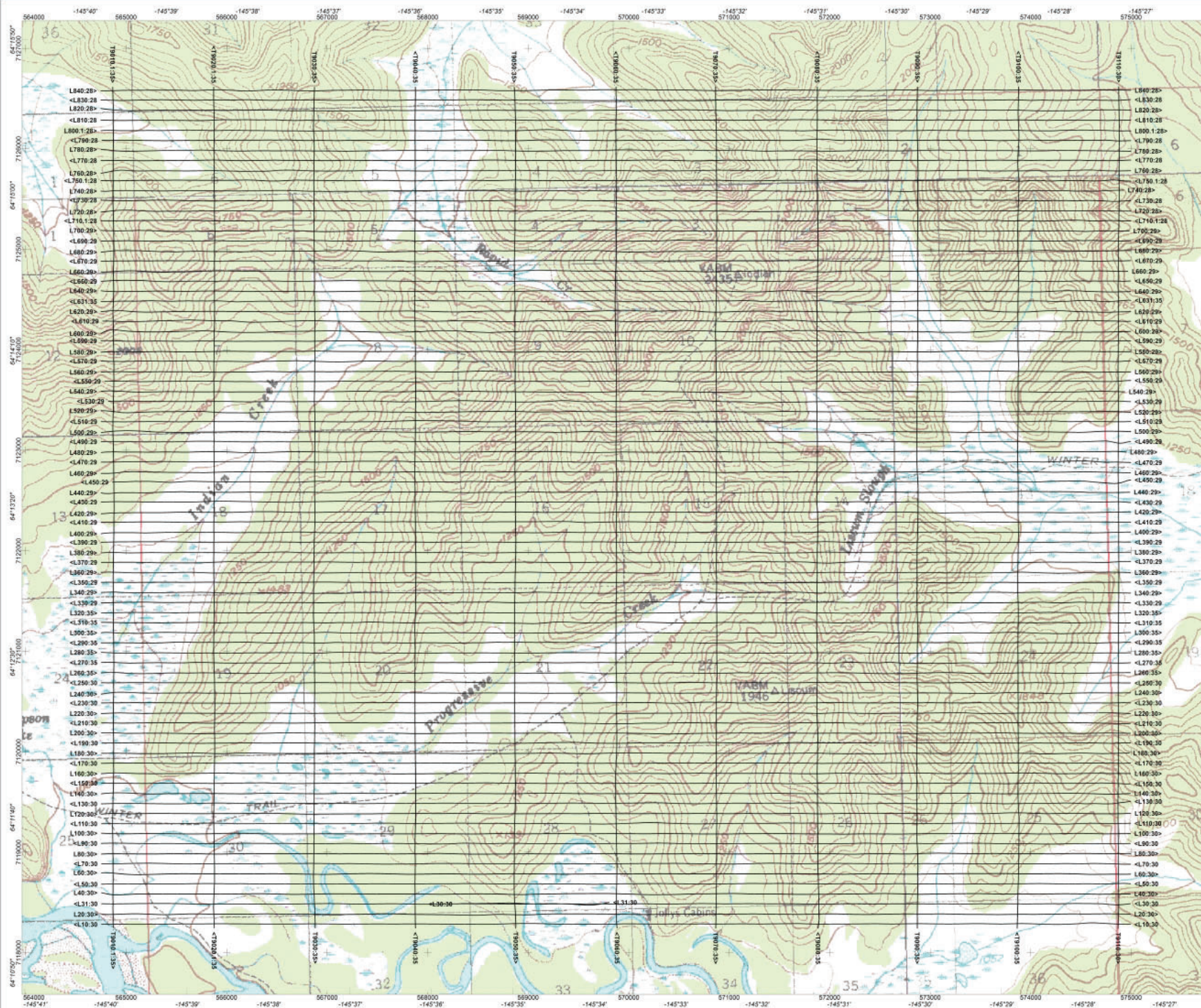


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# LEGEND

Survey Date: July 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

## SURVEY PARAMETERS:

Mean Terrain Clearance: 80 meters  
Helicopter: 80 meters  
Spectrometer: 80 meters  
Magnetometer: 80 meters  
Transverse Line Direction: 90° (E-W)  
Control Line Direction: 0180° (N-S)  
Transverse Line Spacing: 100 m  
Control Line Spacing: 1000 m

## AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS-3 Magnetometer Sensor and Fluxgate Map, Birksgate Configuration  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

## AIRBORNE GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel gamma-ray Spectrometer with 35.5 liter "downward looking" NaI sensor and 8.4 liter "upward looking" NaI sensor  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

## AIRBORNE NAVIGATION SYSTEM:

Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second

## BASE STATION MAGNETOMETER:

GEM GEM-10TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.002 nT

## Relative regional location of survey areas



## Location of all the blocks collected



## Alaska Division of Geological & Geophysical Surveys

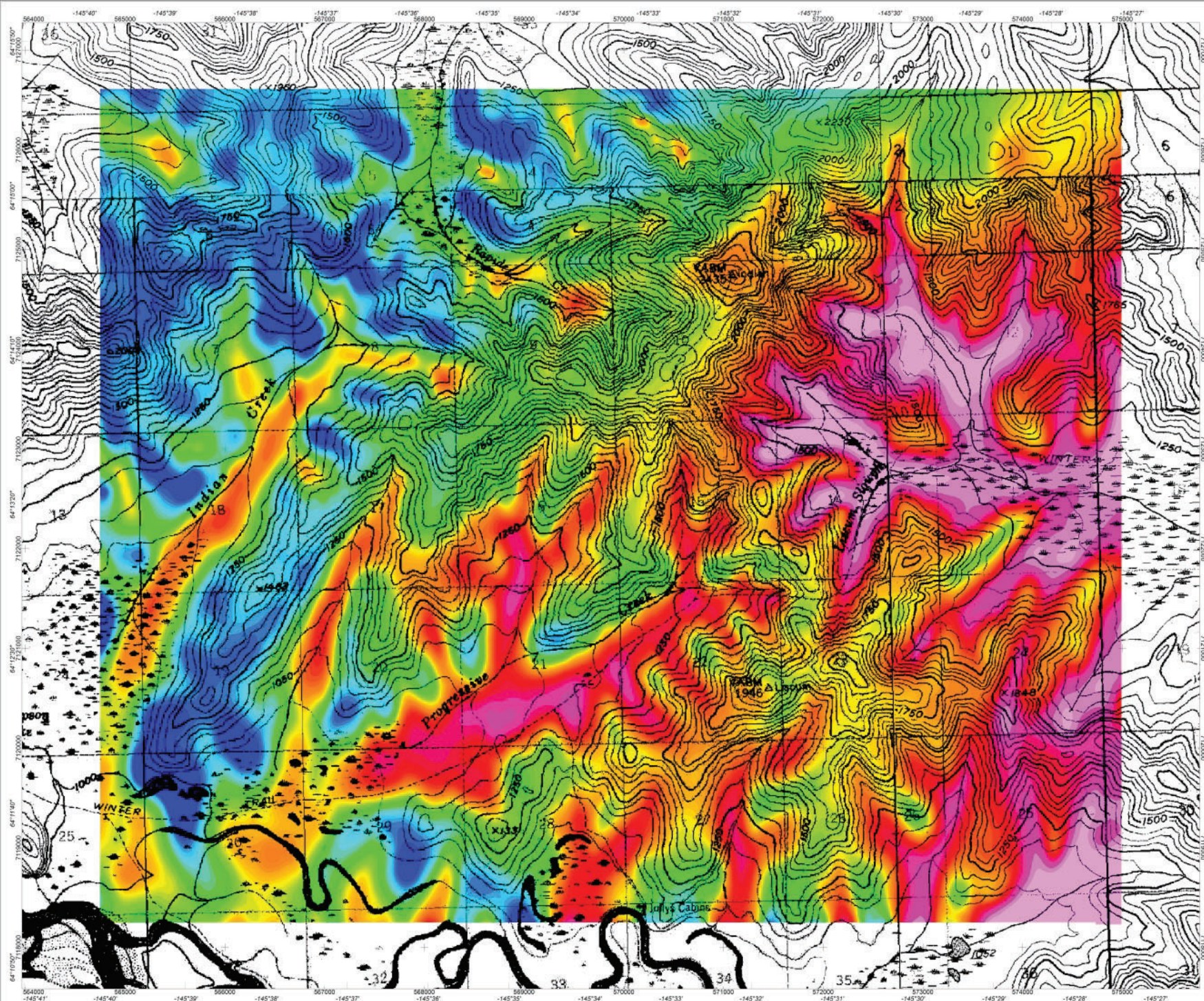
Shaw Creek and Shawnee Peak Airborne Magnetic and Radiometric Geophysical Survey

## Flown Flight Path over USGS Topo Map

## LMS-X Block

Geophysical Report 2020-16





# LEGEND

Survey Date:  
Helicopter Type:  
Registration:

July, 2020  
AD35082  
C-GSVY

## SURVEY PARAMETERS:

Mean Terrain Clearance:  
Helicopter:  
Spectrometer:  
Magnetometer:  
Traverse Line Direction:  
Control Line Direction:  
Traverse Line Spacing:  
Control Line Spacing:

80 meters  
80 meters  
80 meters  
80° (E-W)  
0180° (N-S)  
100 m  
1000 m

## AIRBORNE MAGNETOMETER SYSTEM:

Sonotek CS-3 Magnetometer Sensor  
and Flange Map, Bitingeay  
Configuration:  
Sampling Rate:  
Sensitivity:

Singer  
20 readings/second  
0.01 nT

## AIRBORNE GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel gamma-ray  
Spectrometer with 35.5 liter "downward looking"  
NaI sensor and 8.4 liter "upward looking"  
NaI sensor  
Temperature/Humidity - Vaisala  
Sampling Rate:

1 reading/second

## AIRBORNE NAVIGATION SYSTEM:

Hemisphere R320 GPS L1/L2  
Sampling Rate:  
Digital Camera Garmin VIRB

5 readings/second

## LASER ALTIMETER:

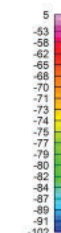
Sampling Rate:

10 readings/second

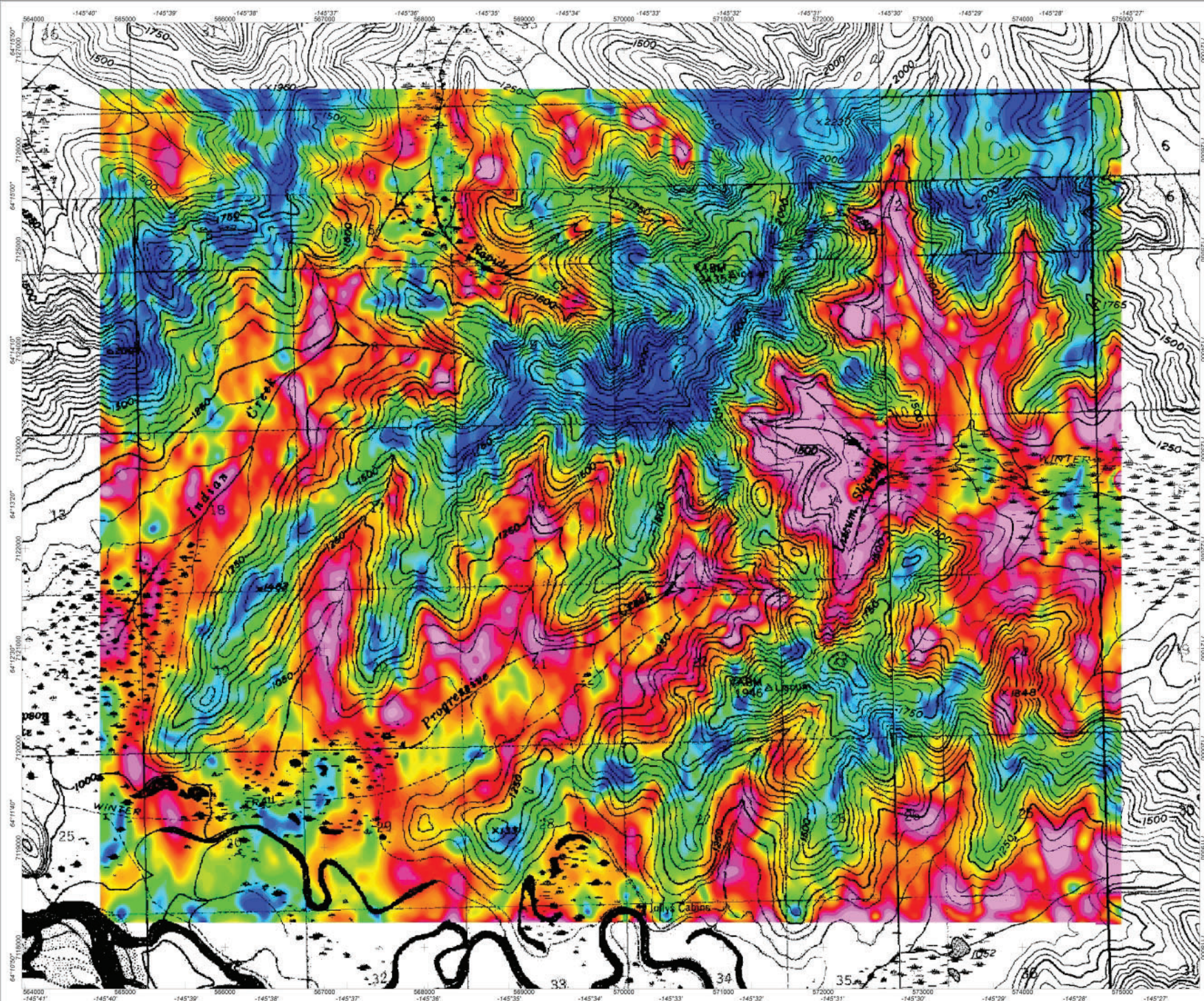
## BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate:  
Sensitivity:

1 reading/second  
0.002 nT







#### LEGEND

Survey Date:  
Helicopter Type:  
Registration:

July, 2020  
AS350B2  
C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance:  
Helicopter:  
Spectrometer:  
Magnetometer:  
Traverse Line Direction:  
Control Line Direction:  
Traverse Line Spacing:  
Control Line Spacing:

80 meters  
80 meters  
80 meters  
80° (E-W)  
0180° (N-S)  
100 m  
1000 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS-3 Magnetometer Sensor  
and Fluxgate Map, Birksgay  
Configuration:  
Sampling Rate:  
Sensitivity:

Singer  
20 readings/second  
0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel gamma-ray  
Spectrometer with 35.5 liter "downward looking"  
NaI sensor and 8.4 liter "upward looking"  
NaI sensor  
Temperature/Humidity - Vaisala  
Sampling Rate:

1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

Hemisphere R320 GPS L1/L2  
Sampling Rate:  
Digital Camera Garmin VIRB

5 readings/second

#### LASER ALTIMETER:

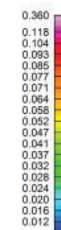
Sampling Rate:

10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate:  
Sensitivity:

1 reading/second  
0.002 nT



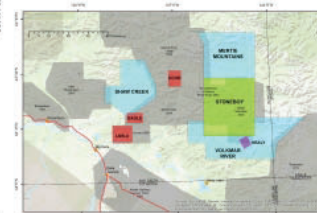
Analytic Signal  
(nT/m)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



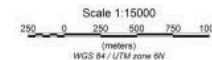
Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

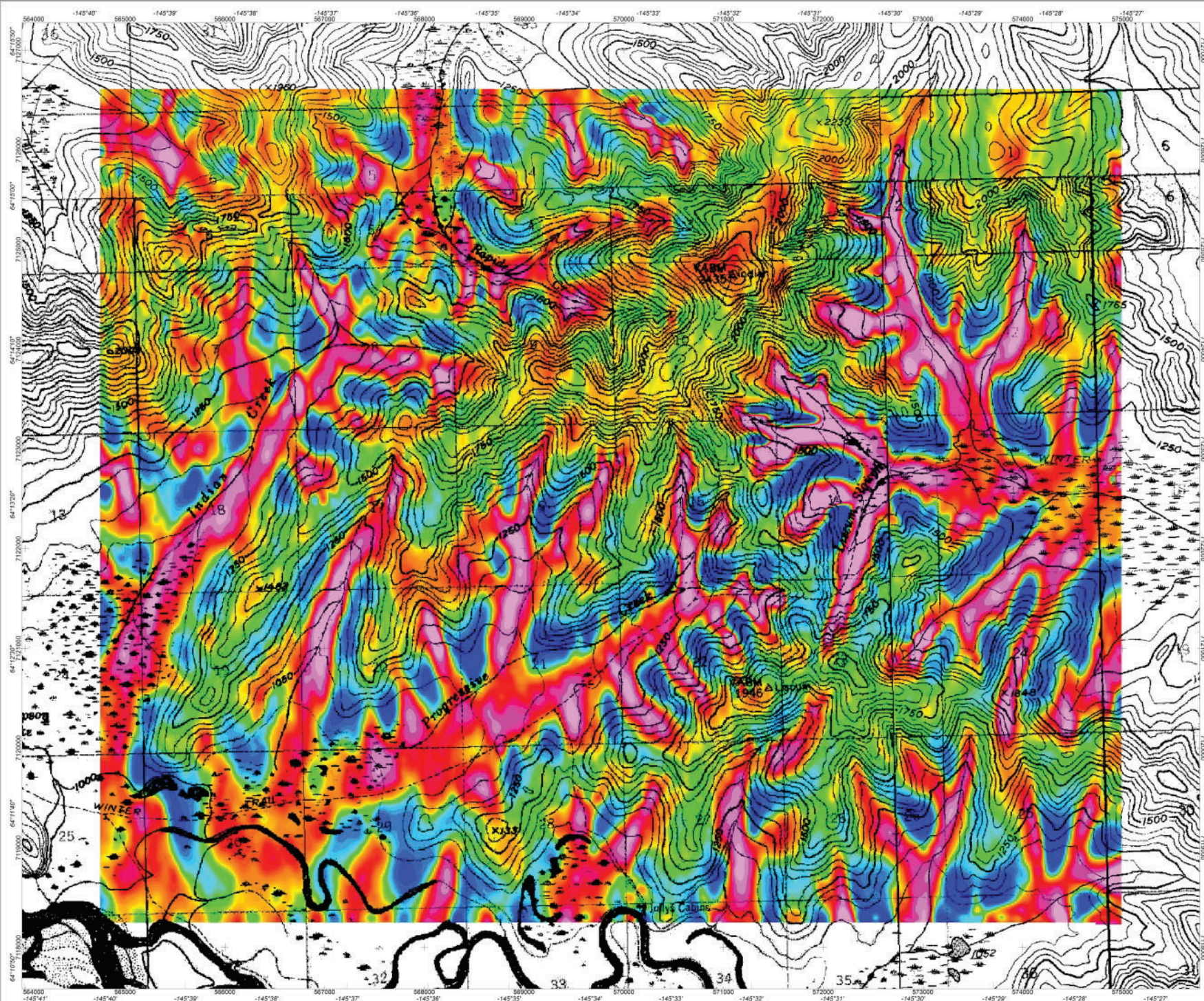
Analytic Signal Map

LMS-X Block

Geophysical Report 2020-16







#### LEGEND

Survey Date:  
Helicopter Type:  
Registration:

July, 2020  
AS350B2  
C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance:  
Helicopter:  
Spectrometer:  
Magnetometer:  
Traverse Line Direction:  
Control Line Direction:  
Traverse Line Spacing:  
Control Line Spacing:

80 meters  
80 meters  
80 meters  
80° (E-W)  
0180° (N-S)  
100 m  
1000 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Softrix CS-3 Magnetometer Sensor  
and Fluxgate Map, Bitmag  
Configuration:  
Sampling Rate:  
Sensitivity:

Stinger  
20 readings/second  
0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel gamma-ray  
Spectrometer with 35.5 liter "downward looking"  
NaI sensor and 8.4 liter "upward looking"  
NaI sensor  
Temperature/Humidity - Vaisala  
Sampling Rate:

1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

Hemisphere R320 GPS L1/L2  
Sampling Rate:  
Digital Camera Garmin VIRB

5 readings/second

#### LASER ALTIMETER:

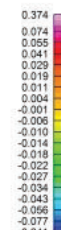
Sampling Rate:

10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GEM-15TW magnetometer  
Sampling Rate:  
Sensitivity:

1 reading/second  
0.022 nT



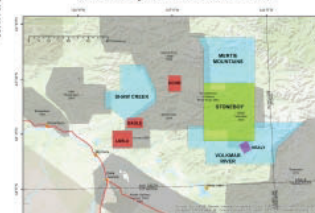
Calculated 1st Vertical Derivative  
(nT/m)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Calculated 1st Vertical Derivative

LMS-X Block

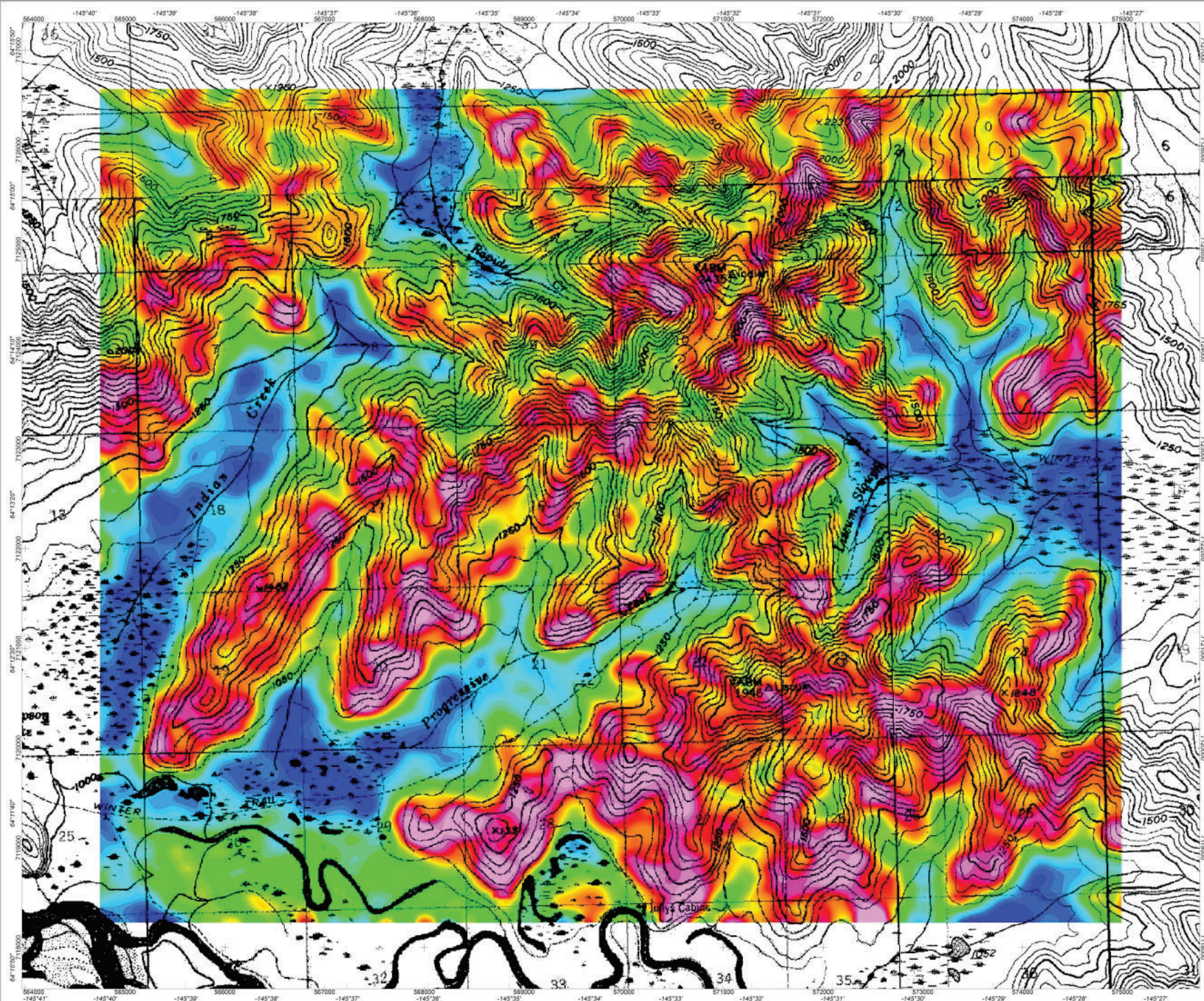
Geophysical Report 2020-16

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Scale 1:15000  
250 0 250 500 750 1000  
WGS 84 / UTM zone 6N





# LEGEND

Survey Date: July 2020  
Helicopter Type: AS350B2  
Registration: C-GSNV

## SURVEY PARAMETERS:

Mean Terrain Clearance: 80 meters  
Helicopter: 80 meters  
Spectrometer: 80 meters  
Magnetometer: 80 meters  
Traverse Line Direction: 90° (E-W)  
Control Line Direction: 0180° (N-S)  
Traverse Line Spacing: 100 m  
Control Line Spacing: 1000 m

## AIRBORNE MAGNETOMETER SYSTEM:

Sonotek CS-3 Magnetometer Sensor and Fluxgate Map, Bikingay Configuration  
Sampling Rate: 1 reading/second  
Sensitivity: 0.01 nT

## AIRBORNE GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel gamma-ray Spectrometer with 35.5 liter "downward looking" NaI sensor and 8.4 liter "upward looking" NaI sensor  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

## AIRBORNE NAVIGATION SYSTEM:

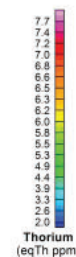
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VIRB

## LASER ALTIMETER:

Sampling Rate: 10 readings/second

## BASE STATION MAGNETOMETER:

GEM GEM-19TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.002 nT

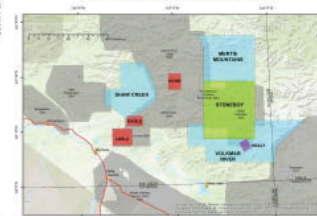


Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne Magnetic and Radiometric Geophysical Survey

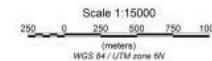
Thorium Map (eqTh ppm)

LMS-X Block

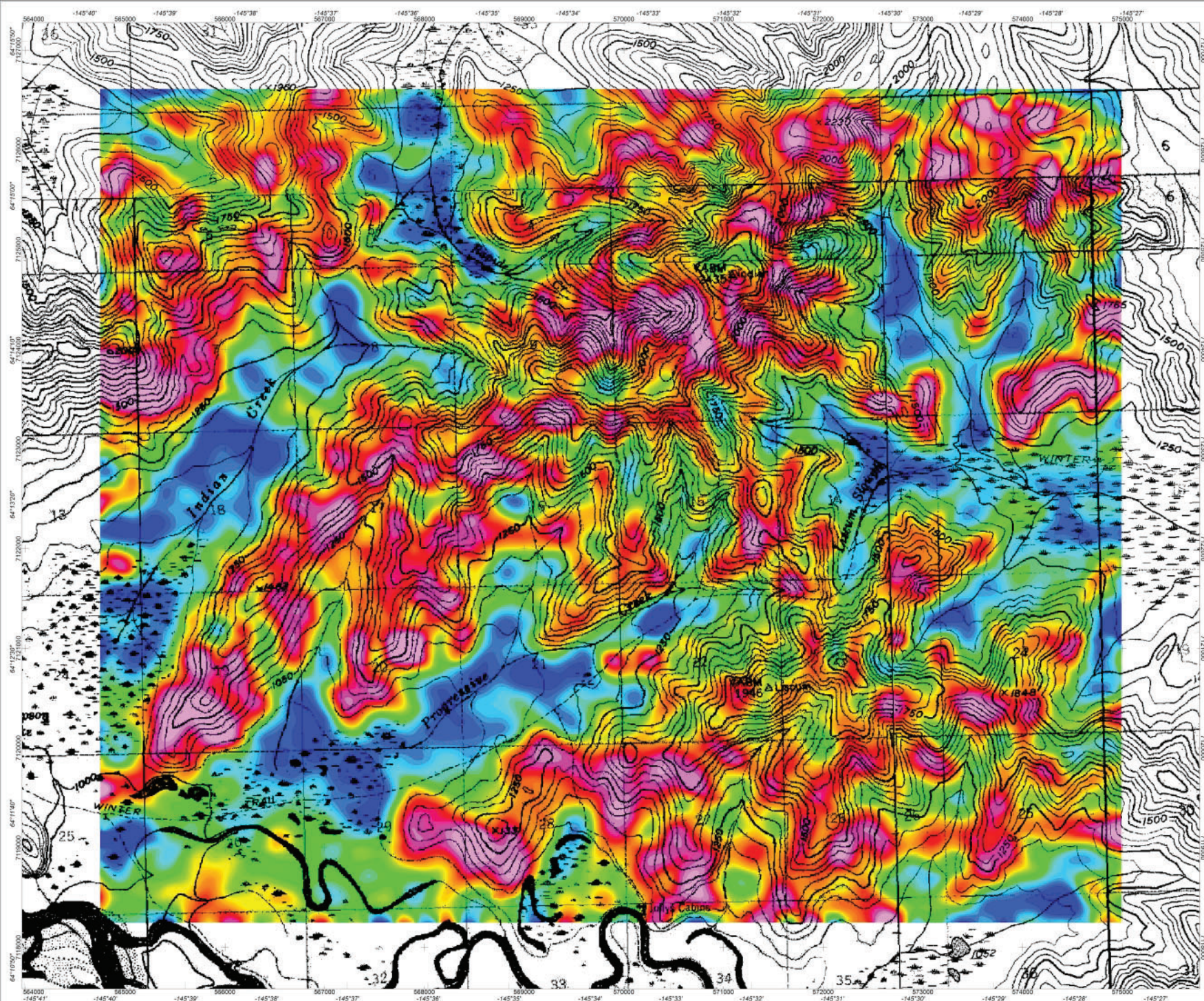
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#### LEGEND

Survey Date:  
Helicopter Type:  
Registration:

July, 2020  
AS350B2  
C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance:  
Helicopter:  
Spectrometer:  
Magnetometer:  
Traverse Line Direction:  
Control Line Direction:  
Traverse Line Spacing:  
Control Line Spacing:

80 meters  
80 meters  
80 meters  
80° (E-W)  
0180° (N-S)  
100 m  
1000 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS-3 Magnetometer Sensor  
and Fluxgate Map, Bilingual  
Configuration:  
Sampling Rate:  
Sensitivity:

Singer  
20 readings/second  
0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel gamma-ray  
Spectrometer with 35.5 liter "downward looking"  
NaI sensor and 8.4 liter "upward looking"  
NaI sensor  
Temperature/Humidity - Vaisala  
Sampling Rate:

1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

Hemisphere R320 GPS L1/L2  
Sampling Rate:  
Digital Camera Garmin VIRB

5 readings/second

#### LASER ALTIMETER:

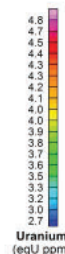
Sampling Rate:

10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate:  
Sensitivity:

1 reading/second  
0.002 nT

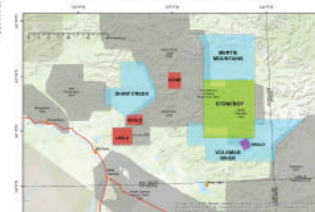


Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

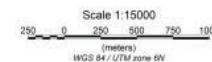
Uranium Map (eqU ppm)

LMS-X Block

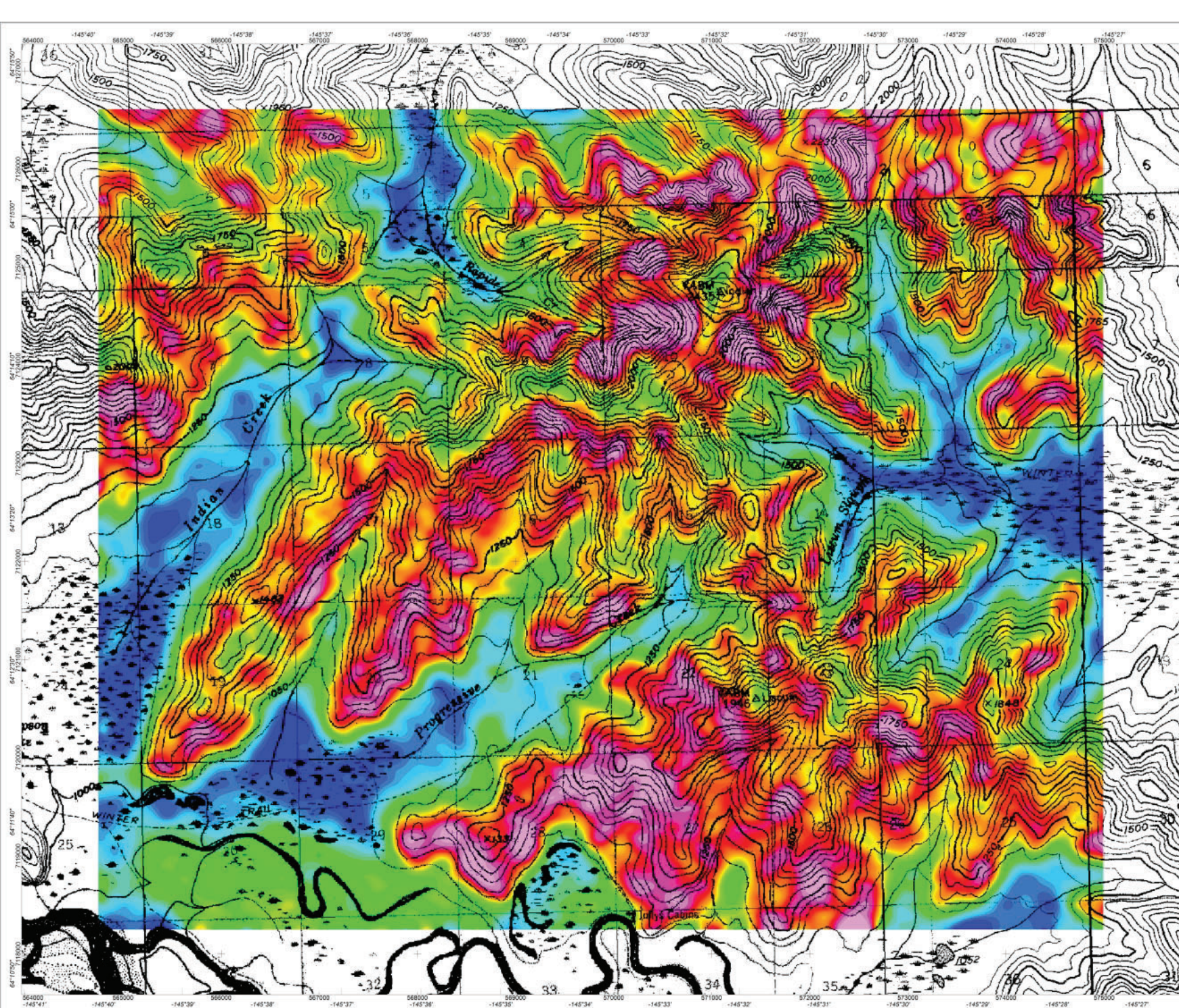
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#### LEGEND

Survey Date:  
Helicopter Type:  
Registration:

July, 2020  
AS350B2  
C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance:  
Helicopter:  
Spectrometer:  
Magnetometer:  
Traverse Line Direction:  
Control Line Direction:  
Traverse Line Spacing:  
Control Line Spacing:

80 meters  
80 meters  
80 meters  
80° (E-W)  
0180° (N-S)  
100 m  
1000 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Sonotek CS-3 Magnetometer Sensor  
and Fluxgate Map, Bitingway  
Configuration:  
Sampling Rate:  
Sensitivity:

Slinger  
20 readings/second  
0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel gamma-ray  
Spectrometer with 35.5 liter "downward looking"  
NaI sensor and 8.4 liter "upward looking"  
NaI sensor  
Temperature/Humidity - Vaisala  
Sampling Rate:

1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

Hemisphere R320 GPS L1/L2  
Sampling Rate:  
Digital Camera Garmin VIRB

5 readings/second

#### LASER ALTIMETER:

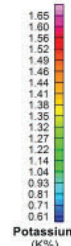
Sampling Rate:

10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate:  
Sensitivity:

1 reading/second  
0.022 nT



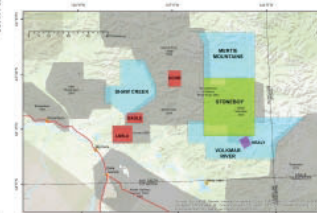
Potassium (K%)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

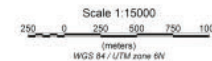
Potassium Map (K%)

LMS-X Block

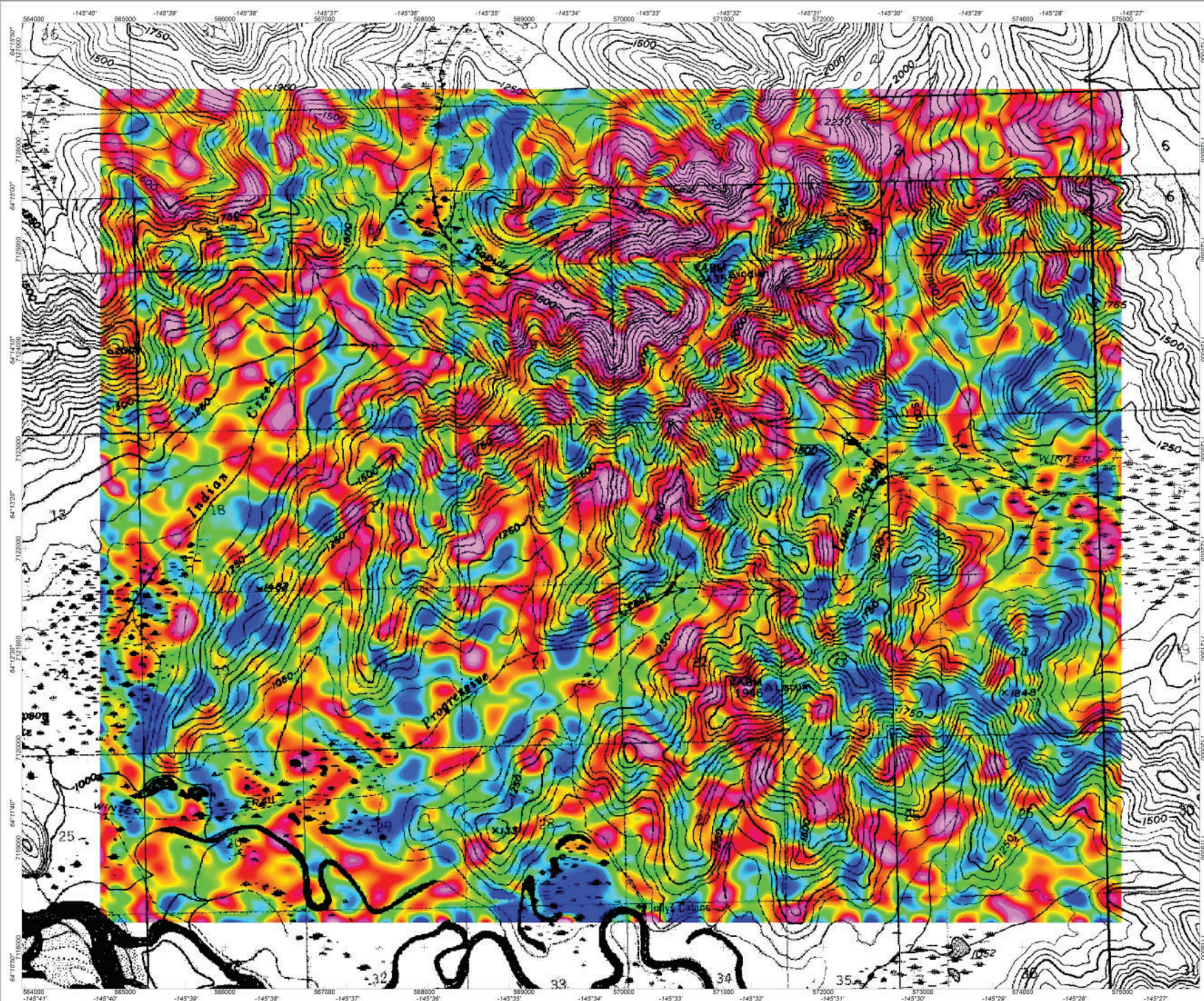
Geophysical Report 2020-16

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#### LEGEND

Survey Date:  
Helicopter Type:  
Registration:

July, 2020  
AS350B2  
C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance:  
Helicopter:  
Spectrometer:  
Magnetometer:  
Traverse Line Direction:  
Control Line Direction:  
Traverse Line Spacing:  
Control Line Spacing:

80 meters  
80 meters  
80 meters  
80° (E-W)  
0180° (N-S)  
100 m  
1000 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Soltesex CS-3 Magnetometer Sensor  
and Fluxgate Map, Birksgay  
Configuration:  
Sampling Rate:  
Sensitivity:

Singer  
20 readings/second  
0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel gamma-ray  
Spectrometer with 35.5 liter "downward looking"  
NaI sensor and 8.4 liter "upward looking"  
NaI sensor  
Temperature/Humidity - Vaisala  
Sampling Rate:

1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

Hemisphere R320 GPS L1/L2  
Sampling Rate:  
Digital Camera Garmin VIRB

5 readings/second

#### LASER ALTIMETER:

Sampling Rate:

10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate:  
Sensitivity:

1 reading/second  
0.022 nT



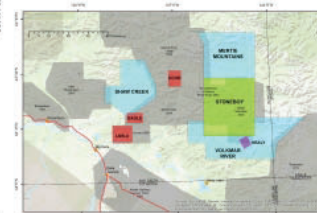
Ratio Potassium / Thorium  
(K% / eqTh ppm)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

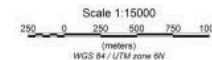
Ratio Potassium/Thorium Map (K/eqTh)

LMS-X Block

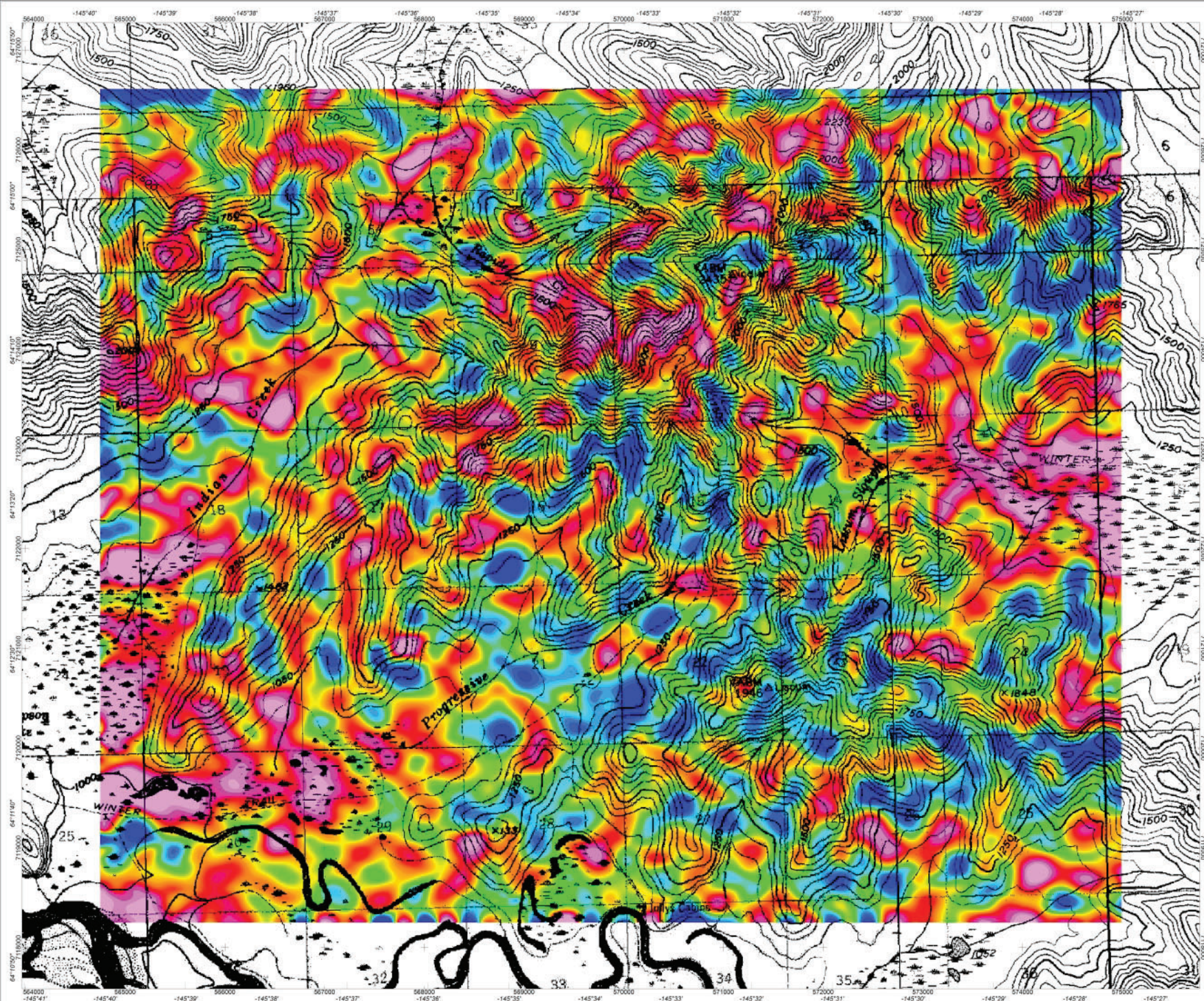
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# LEGEND

Survey Date:  
Helicopter Type:  
Registration:

July, 2020  
AS350B2  
C-GSVY

## SURVEY PARAMETERS:

Mean Terrain Clearance:  
Helicopter:  
Spectrometer:  
Magnetometer:  
Traverse Line Direction:  
Control Line Direction:  
Traverse Line Spacing:  
Control Line Spacing:

80 meters  
80 meters  
80 meters  
80° (E-W)  
0180° (N-S)  
100 m  
1000 m

## AIRBORNE MAGNETOMETER SYSTEM:

Sonotek CS-3 Magnetometer Sensor  
and Fluxgate Map, Bitingway  
Configuration:  
Sampling Rate:  
Sensitivity:

Singer  
20 readings/second  
0.01 nT

## AIRBORNE GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel gamma-ray  
Spectrometer with 35.5 liter "downward looking"  
NaI sensor and 8.4 liter "upward looking"  
NaI sensor  
Temperature/Humidity - Vaisala  
Sampling Rate:

1 reading/second

## AIRBORNE NAVIGATION SYSTEM:

Hemisphere R320 GPS L1/L2  
Sampling Rate:  
Digital Camera Garmin VIRB

5 readings/second

## LASER ALTIMETER:

Sampling Rate:

10 readings/second

## BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate:  
Sensitivity:

1 reading/second  
0.002 nT



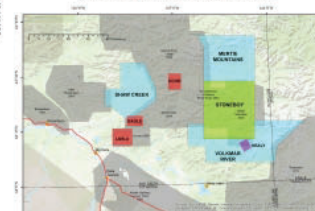
Ratio Uranium / Thorium  
(eqU ppm / eqTh ppm)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Ratio Uranium/Thorium Map (eqU/eqTh)

LMS-X Block

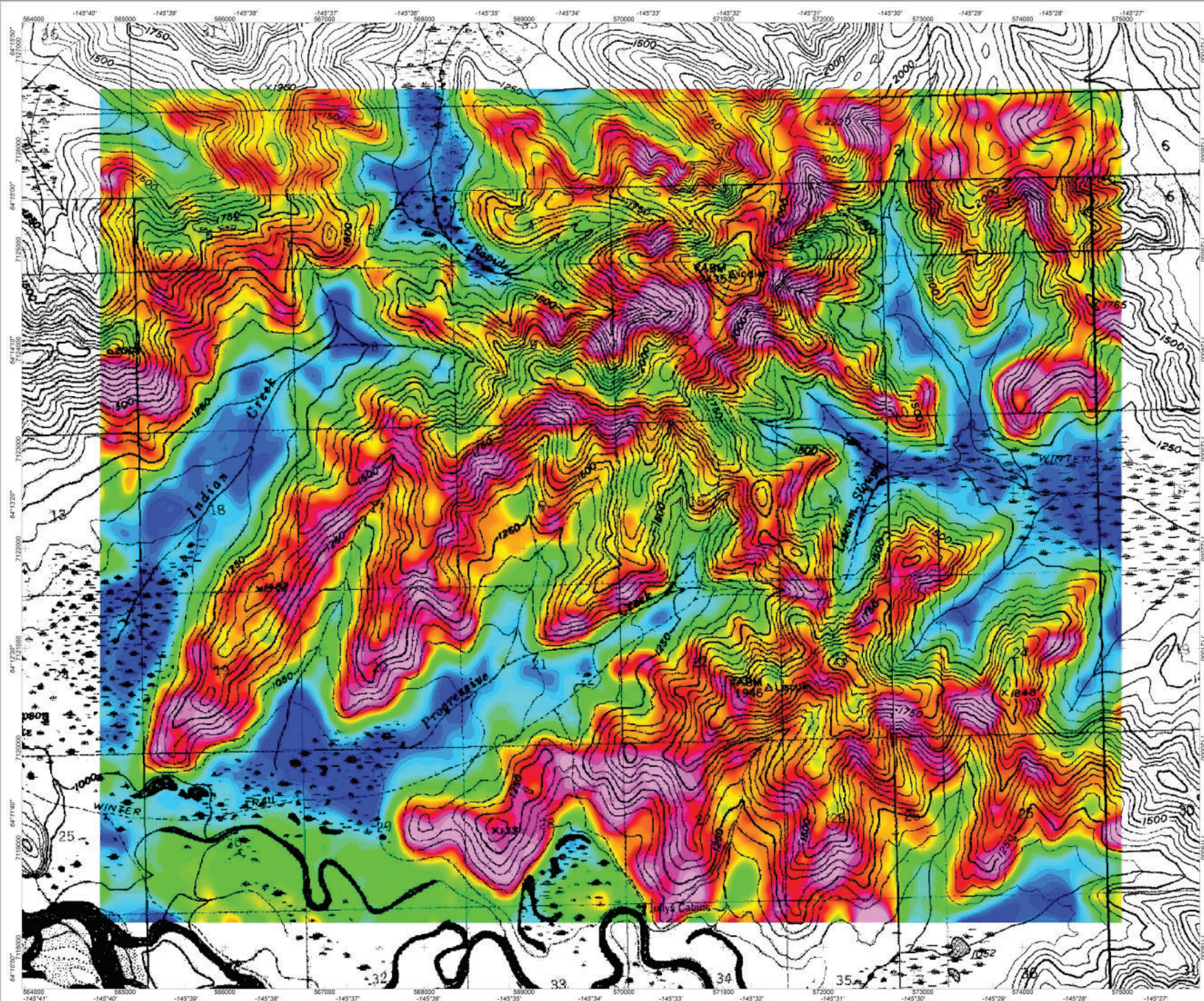
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Scale 1:15000  
250 0 250 500 750 1000  
GWS 84 / UTM zone 6N





#### LEGEND

Survey Date:  
Helicopter Type:  
Registration:

July, 2020  
AS350B2  
C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance:  
Helicopter:  
Spectrometer:  
Magnetometer:  
Traverse Line Direction:  
Control Line Direction:  
Traverse Line Spacing:  
Control Line Spacing:

80 meters  
80 meters  
80 meters  
80° (E-W)  
0180° (N-S)  
100 m  
1000 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Sonotek CS-3 Magnetometer Sensor  
and Fluxgate Map, Bitingaley  
Configuration:  
Sampling Rate:  
Sensitivity:

Singer  
20 readings/second  
0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel gamma-ray  
Spectrometer with 35.5 liter "downward looking"  
NaI sensor and 8.4 liter "upward looking"  
NaI sensor  
Temperature/Humidity - Vaisala  
Sampling Rate:

1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

Hemisphere R320 GPS L1/L2  
Sampling Rate:  
Digital Camera Garmin VIRB

5 readings/second

#### LASER ALTIMETER:

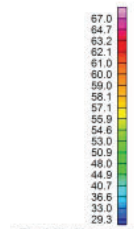
Sampling Rate:

10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate:  
Sensitivity:

1 reading/second  
0.022 nT



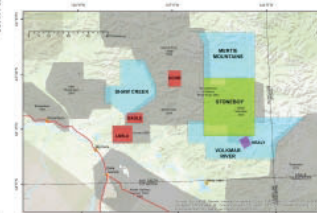
Total Air Absorbed Dose Rate  
(nGy/h)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

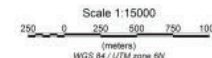
Total Air Absorbed Dose  
Rate Map (Taadr)

LMS-X Block

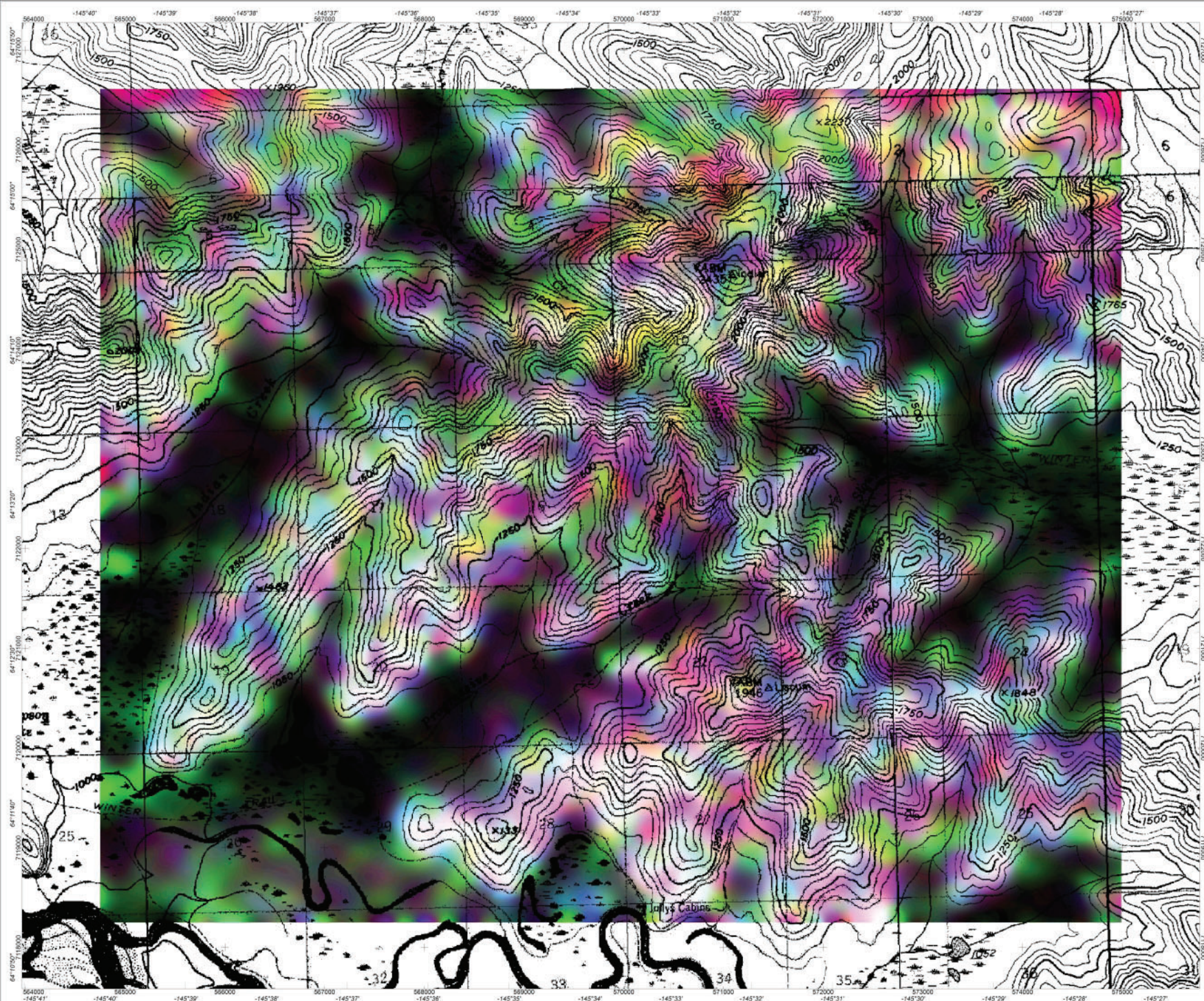
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#### LEGEND

Survey Date:  
Helicopter Type:  
Registration:

July, 2020  
AS350B2  
C-GSNV

#### SURVEY PARAMETERS:

Mean Terrain Clearance:  
Helicopter:  
Spectrometer:  
Magnetometer:  
Traverse Line Direction:  
Control Line Direction:  
Traverse Line Spacing:  
Control Line Spacing:

80 meters  
80 meters  
80 meters  
80° (E-W)  
0180° (N-S)  
100 m  
1000 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Sorbus CS-3 Magnetometer Sensor  
and Flange Map, Bitingley  
Configuration:  
Sampling Rate:  
Sensitivity:

Singer  
20 readings/second  
0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel gamma-ray  
Spectrometer with 35.5 liter "downward looking"  
NaI sensor and 8.4 liter "upward looking"  
NaI sensor  
Temperature/Humidity - Vaisala  
Sampling Rate:

1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

Hemisphere R320 GPS L1/L2  
Sampling Rate:  
Digital Camera Garmin VIRB

5 readings/second

#### LASER ALTIMETER:

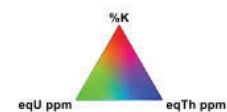
Sampling Rate:

10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate:  
Sensitivity:

1 reading/second  
0.022 nT



Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Ternary Map (%K - eqU ppm - eqTh ppm)

LMS-X Block

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#### LEGEND

Survey Date:  
Helicopter Type:  
Registration:

July, 2020  
AS350B2  
C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance:  
Helicopter:  
Spectrometer:  
Magnetometer:

130 meters  
130 meters  
130 meters

Traverse Line Direction:  
Control Line Direction:  
Traverse Line Spacing:  
Control Line Spacing:

90° (E-W)  
0180° (N-S)  
400 m  
4000 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Schlumberger CS-3 Magnetometer Sensor  
and Fluxgate Mag. Bilsingley  
Configuration:  
Sampling Rate:  
Sensitivity:

Singer  
20 readings/second  
0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSK-5 multi-channel gamma-ray  
Spectrometer with 33.6 liters "downward looking"  
NaI sensor and 8.4 liters "upward looking"  
NaI sensor.  
Temperature/Humidity - Vaisala

1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

Hemisphere R320 GPS L1/L2  
Sampling Rate:  
Digital Camera Garmin VIRB

5 reading/second

#### LASER ALTIMETER:

Sampling Rate:

10 readings/second

#### BASE STATION MAGNETOMETER:

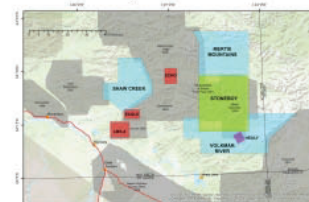
GEM GSM-19TV magnetometer  
Sampling Rate:  
Sensitivity:

1 reading/second  
0.02 nT

#### Relative regional location of survey areas



#### Location of all the blocks collected



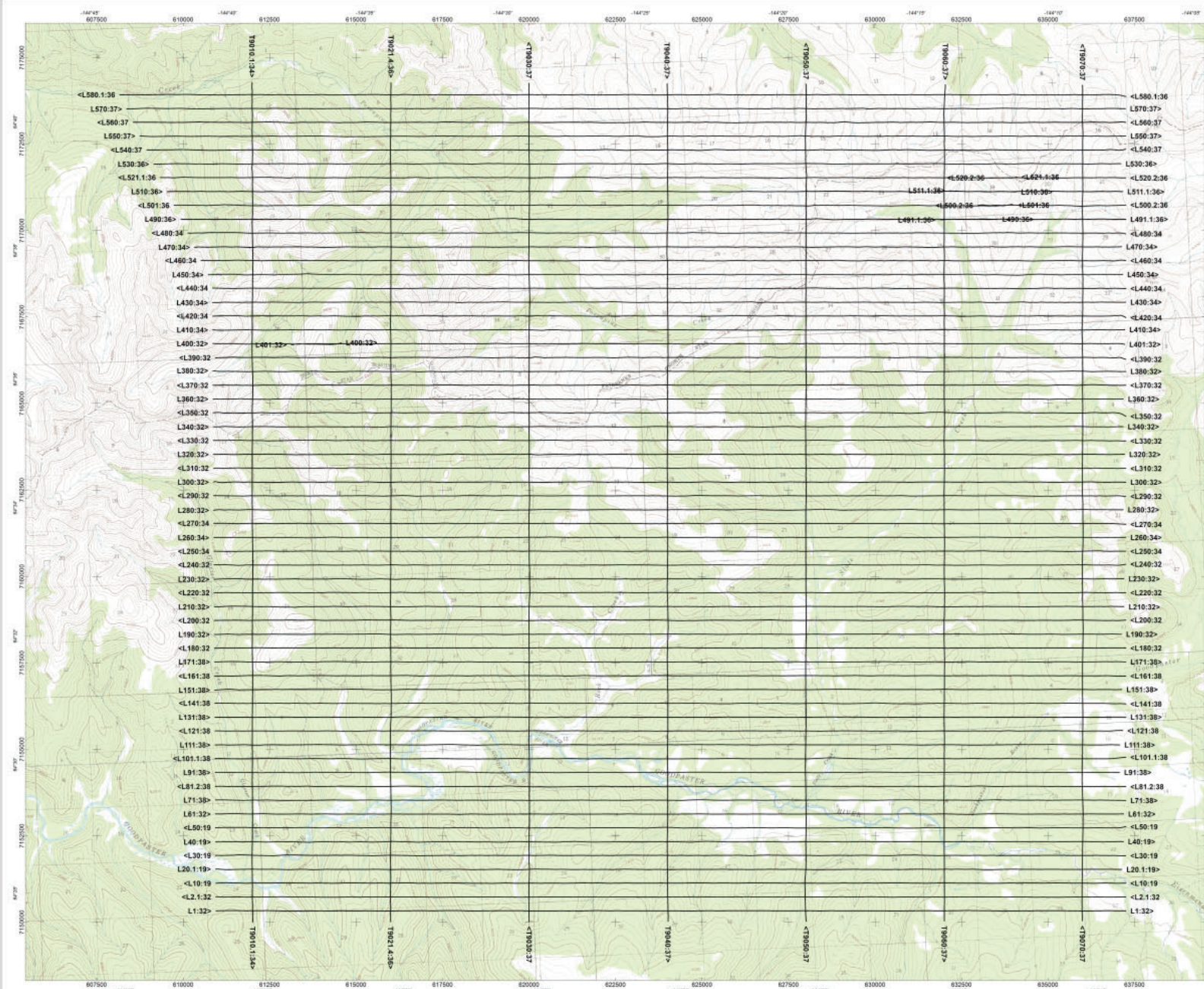
### Alaska Division of Geological & Geophysical Surveys

#### Shaw Creek and Shawnee Peak Airborne Magnetic and Radiometric Geophysical Survey

#### Flown Flight Path over USGS Topo Map

#### Mertie Mountains Block

Geophysical Report 2020-16







#### LEGEND

Survey Date: July, 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance: 130 meters  
Helicopter: 130 meters  
Spectrometer: 130 meters  
Magnetometer: 130 meters  
Traverse Line Direction: 90° (E-W)  
Control Line Direction: 0180° (N-S)  
Traverse Line Spacing: 400 m  
Control Line Spacing: 4000 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Schintex CS - 3 Magnetometer Sensor and Fluxgate Mag. Bilingsley  
Configuration: Slinger  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSK-5 multi-channel gamma-ray Spectrometer with 33.6 liters 'downward looking' NaI sensor and 8.4 liters 'upward looking' NaI sensor.  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

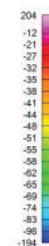
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VIRB

#### LASER ALTIMETER:

Sampling Rate: 10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TV magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT



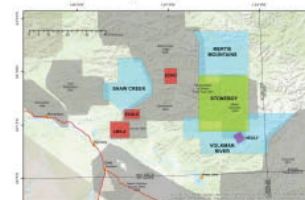
Residual Magnetic Intensity (nT)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



## Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Residual Magnetic Intensity Map

Mertie Mountains Block

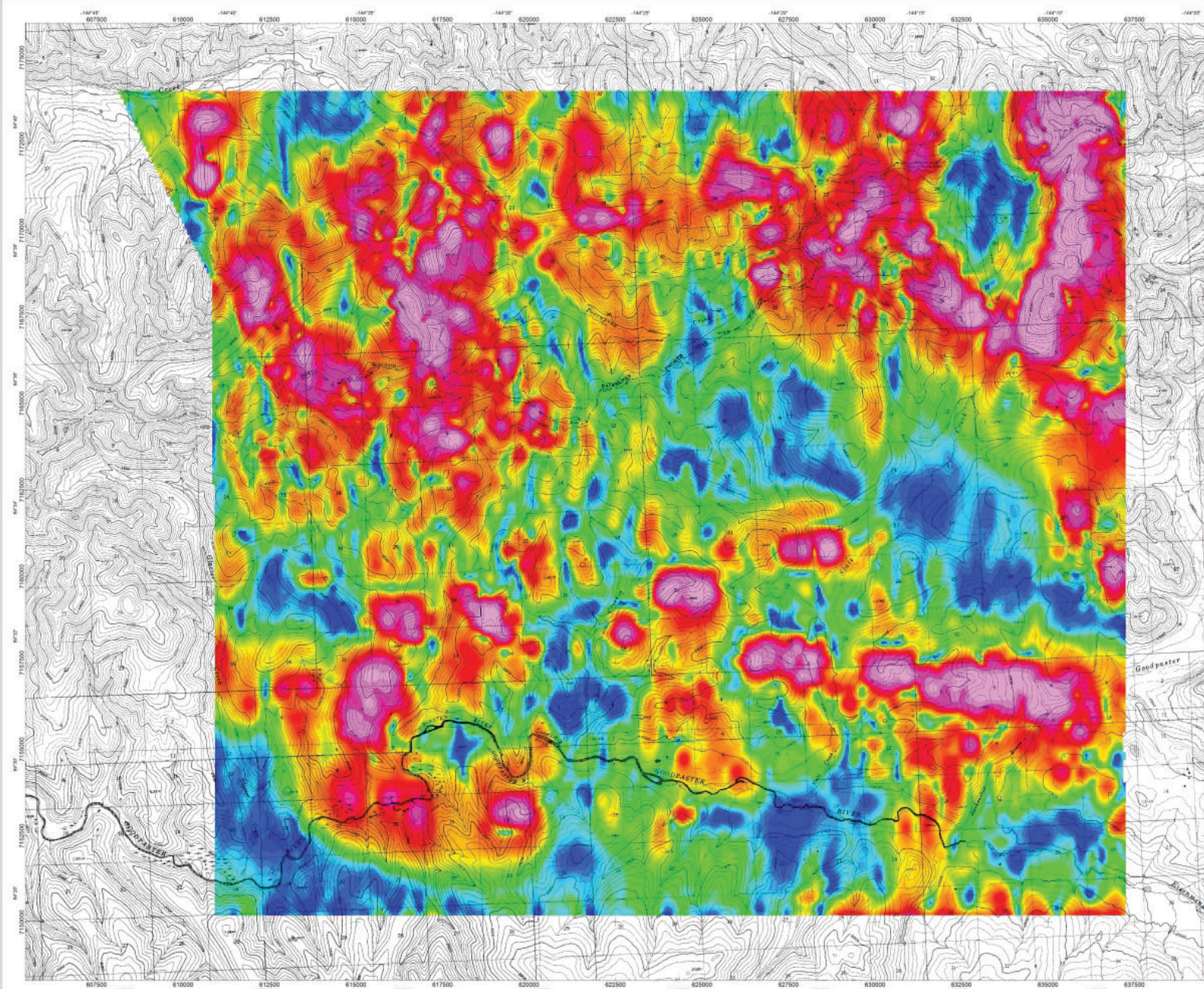
Geophysical Report 2020-16

ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS  
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Website: <https://dggs.alaska.gov/>

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#### LEGEND

Survey Date: July, 2020  
 Helicopter Type: AS350B2  
 Registration: C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance: 130 meters  
 Helicopter: 130 meters  
 Magnetometer: 130 meters  
 Traverse Line Direction: 90° (E-W)  
 Control Line Direction: 0180° (N-S)  
 Traverse Line Spacing: 400 m  
 Control Line Spacing: 400 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Schintex CS - 3 Magnetometer Sensor and Fluxgate Mag. Bilingley  
 Configuration: Slinger  
 Sampling Rate: 20 readings/second  
 Sensitivity: 0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSK-5 multi-channel gamma-ray Spectrometer with 33.6 liters 'downward looking' NaI sensor and 8.4 liters 'upward looking' NaI sensor.  
 Temperature/Humidity - Vaisala  
 Sampling Rate: 1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

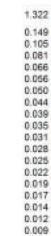
Hemisphere R320 GPS L1/L2  
 Sampling Rate: 5 readings/second  
 Digital Camera Garmin VIRB

#### LASER ALTIMETER:

Sampling Rate: 10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TV magnetometer  
 Sampling Rate: 1 reading/second  
 Sensitivity: 0.02 nT



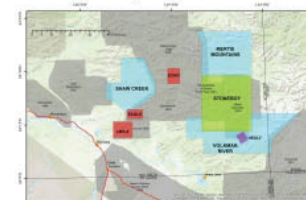
Analytic Signal  
 (nT/m)

Contours: USGS Topo Map

Relative regional location  
 of survey areas



Location of all the blocks collected



## Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
 Magnetic and Radiometric Geophysical Survey

Analytic Signal Map

Mertie Mountains Block

Geophysical Report 2020-16

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#### LEGEND

Survey Date: July, 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance: 130 meters  
Helicopter: 130 meters  
Spectrometer: 130 meters  
Magnetometer:  
Traverse Line Direction: 90° (E-W)  
Control Line Direction: 0180° (N-S)  
Traverse Line Spacing: 400 m  
Control Line Spacing: 4000 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS - 3 Magnetometer Sensor and Fluxgate Mag. Bilingsley  
Configuration:  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel gamma-ray Spectrometer with 33.6 liters "downward looking" NaI sensor and 8.4 liters "upward looking" NaI sensor.  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

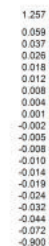
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VIRB

#### LASER ALTIMETER:

Sampling Rate: 10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TV magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.02 nT

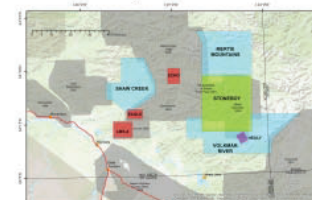


Relative regional location of survey areas



Calculated 1st Vertical Derivative (nT/m)  
Contours: USGS Topo Map

Location of all the blocks collected



## Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Calculated 1st Vertical Derivative Map

Mertie Mountains Block

Geophysical Report 2020-16







#### LEGEND

Survey Date: July, 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance: 130 meters  
Helicopter: 130 meters  
Spectrometer: 130 meters  
Magnetometer:  
Traverse Line Direction: 90° (E-W)  
Control Line Direction: 0180° (N-S)  
Traverse Line Spacing: 400 m  
Control Line Spacing: 4000 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS - 3 Magnetometer Sensor  
and Fluxgate Mag. Bilingsey  
Configuration:  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSK-5 multi-channel gamma-ray  
Spectrometer with 33.6 liters 'downward looking'  
NaI sensor and 8.4 liters 'upward looking'  
NaI sensor.  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

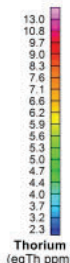
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 reading/second  
Digital Camera Garmin VIRB

#### LASER ALTIMETER:

Sampling Rate: 10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TV magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT

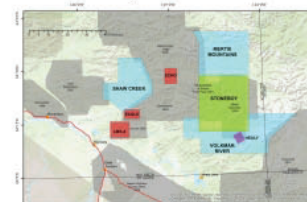


Contours: USGS Topo Map

Relative regional location  
of survey areas



Location of all the blocks collected



### Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Thorium Map (eqTh ppm)

Mertie Mountains Block

Geophysical Report 2020-16







#### LEGEND

Survey Date: July, 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance: 130 meters  
Helicopter: 130 meters  
Spectrometer: 130 meters  
Magnetometer:  
Traverse Line Direction: 90° (E-W)  
Control Line Direction: 0180° (N-S)  
Traverse Line Spacing: 400 m  
Control Line Spacing: 4000 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Schintex CS - 3 Magnetometer Sensor  
and Fluigent Mag. Bilingsley  
Configuration: Slinger  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSK-5 multi-channel gamma-ray  
Spectrometer with 33.6 liters "downward looking"  
NaI sensor and 8.4 liters "upward looking"  
NaI sensor.  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

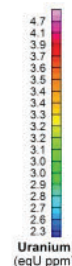
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VIRB

#### LASER ALTIMETER:

Sampling Rate: 10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TV magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT

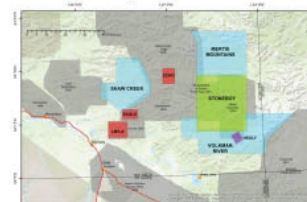


Contours: USGS Topo Map

Relative regional location  
of survey areas



Location of all the blocks collected



## Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

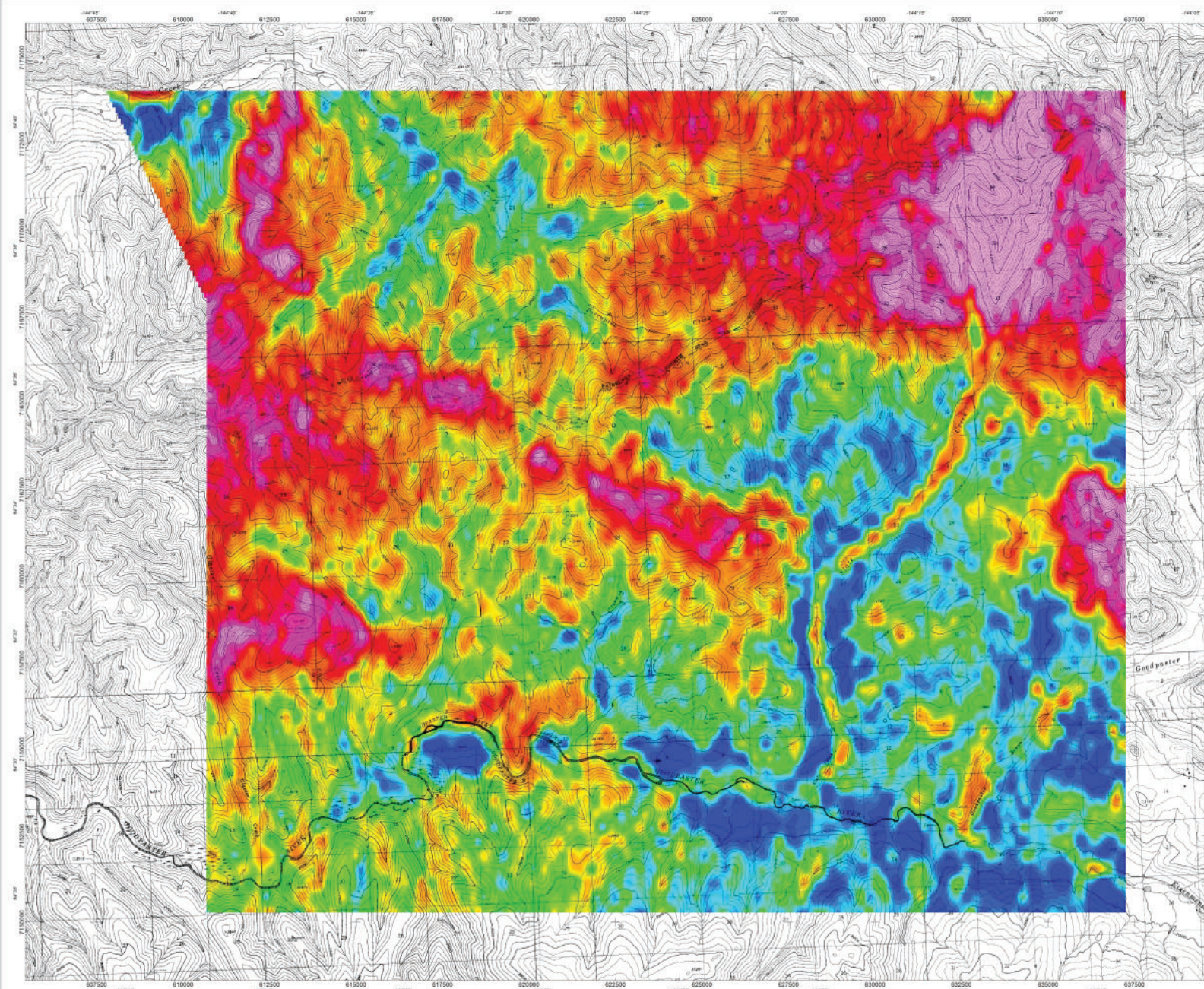
Uranium Map (eqU ppm)

Mertie Mountains Block

Geophysical Report 2020-16







#### LEGEND

Survey Date: July, 2020  
 Helicopter Type: AS350B2  
 Registration: C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance: 130 meters  
 Helicopter: 130 meters  
 Spectrometer: 130 meters  
 Magnetometer: 130 meters  
 Traverse Line Direction: 90° (E-W)  
 Control Line Direction: 0180° (N-S)  
 Traverse Line Spacing: 400 m  
 Control Line Spacing: 4000 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS - 3 Magnetometer Sensor and Fluxgate Mag. Bilingsley  
 Configuration: Singer  
 Sampling Rate: 20 readings/second  
 Sensitivity: 0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSK-5 multi-channel gamma-ray Spectrometer with 33.6 liters 'downward looking' NaI sensor and 8.4 liters 'upward looking' NaI sensor.  
 Temperature/Humidity - Vaisala  
 Sampling Rate: 1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

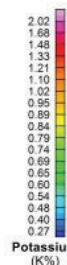
Hemisphere R320 GPS L1/L2  
 Sampling Rate: 5 readings/second  
 Digital Camera Garmin VIRB

#### LASER ALTIMETER:

Sampling Rate: 10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TV magnetometer  
 Sampling Rate: 1 reading/second  
 Sensitivity: 0.022 nT

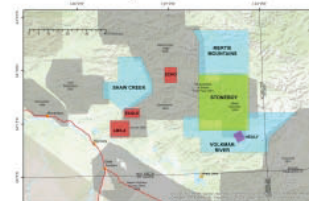


Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



### Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
 Magnetic and Radiometric Geophysical Survey

Potassium Map (K%)

Mertie Mountains Block

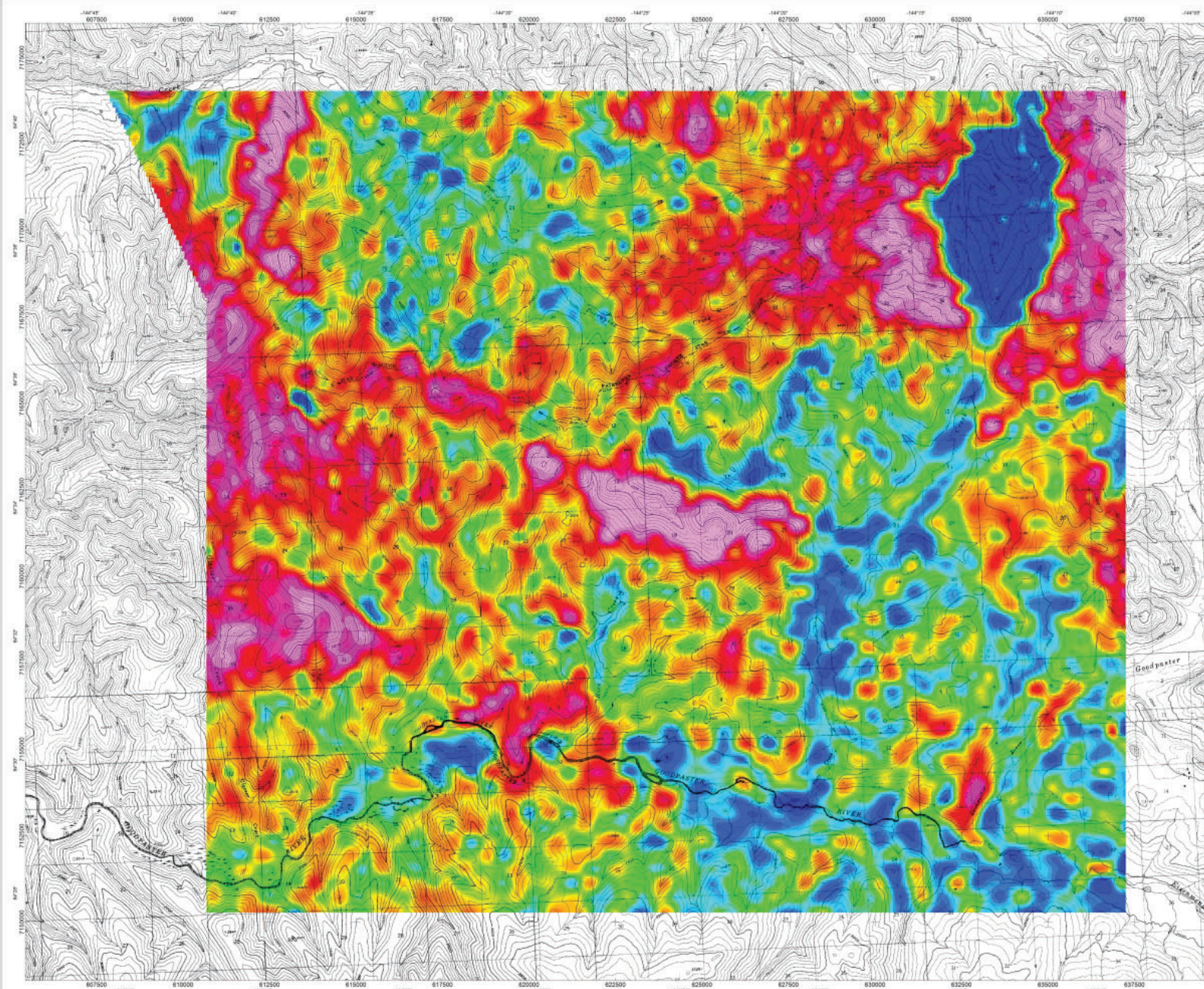
Geophysical Report 2020-16

ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS  
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#### LEGEND

Survey Date: July, 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance: 130 meters  
Helicopter: 130 meters  
Spectrometer: 130 meters  
Magnetometer: 130 meters  
Traverse Line Direction: 90° (E-W)  
Control Line Direction: 0180° (N-S)  
Traverse Line Spacing: 400 m  
Control Line Spacing: 4000 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS - 3 Magnetometer Sensor and Fluxgate Mag. Bilingsley  
Configuration: Slinger  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel gamma-ray Spectrometer with 33.6 liters 'downward looking' NaI sensor and 8.4 liters 'upward looking' NaI sensor.  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 reading/second  
Digital Camera Garmin VIRB

#### LASER ALTIMETER:

Sampling Rate: 10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT



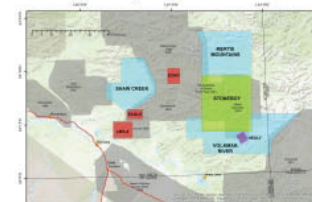
Ratio Potassium / Thorium  
(K% / eqTh ppm)

Contours: USGS Topo Map

Relative regional location  
of survey areas



Location of all the blocks collected



Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Ratio Potassium/Thorium Map (K/eqTh)

Mertie Mountains Block

Geophysical Report 2020-16

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Phone: +1 907-451-5000  
Website: <https://dgg.alaska.gov/>





#### LEGEND

Survey Date: July, 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance: 130 meters  
Helicopter: 130 meters  
Spectrometer: 130 meters  
Magnetometer: 130 meters  
Traverse Line Direction: 90° (E-W)  
Control Line Direction: 0180° (N-S)  
Traverse Line Spacing: 400 m  
Control Line Spacing: 4000 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS-3 Magnetometer Sensor and Fluxgate Mag. Bilingsley  
Configuration: Slinger  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSK-5 multi-channel gamma-ray Spectrometer with 33.6 liters "downward looking" NaI sensor and 8.4 liters "upward looking" NaI sensor.  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

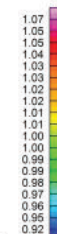
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VIRB

#### LASER ALTIMETER:

Sampling Rate: 10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TV magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.02 nT



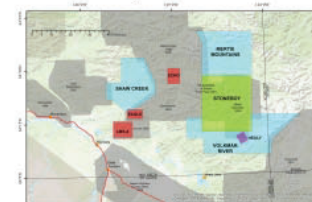
Ratio Uranium / Thorium  
(eqU ppm / eqTh ppm)

Contours: USGS Topo Map

Relative regional location  
of survey areas



Location of all the blocks collected



### Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Ratio Uranium/Thorium Map (eqU/eqTh)

Mertie Mountains Block

Geophysical Report 2020-16







#### LEGEND

Survey Date: July, 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance: 130 meters  
Helicopter: 130 meters  
Spectrometer: 130 meters  
Magnetometer: 130 meters  
Traverse Line Direction: 90° (E-W)  
Control Line Direction: 0180° (N-S)  
Traverse Line Spacing: 400 m  
Control Line Spacing: 400 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS - 3 Magnetometer Sensor and Fluxgate Mag. Billingsley  
Configuration: Singer  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSK-5 multi-channel gamma-ray Spectrometer with 33.6 liters "downward looking" NaI sensor and 8.4 liters "upward looking" NaI sensor.  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

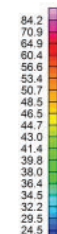
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VIRB

#### LASER ALTIMETER:

Sampling Rate: 10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TV magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.02 nT



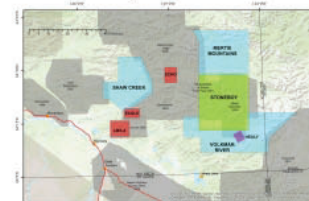
Total Air Absorbed Dose Rate (nGy/h)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



### Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

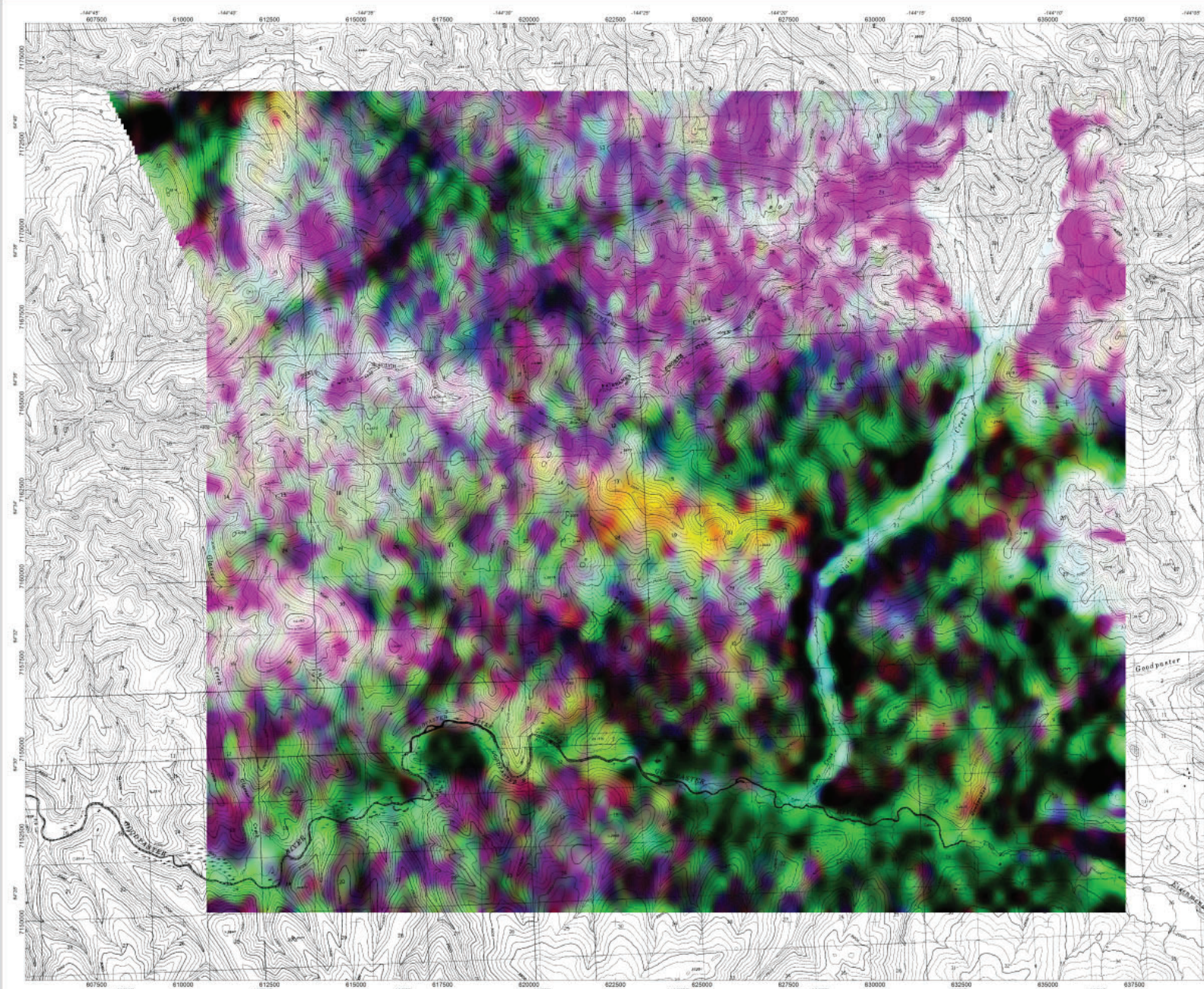
Total Air Absorbed Dose Rate Map (Taadr)

Mertie Mountains Block

Geophysical Report 2020-16







#### LEGEND

Survey Date: July, 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

#### SURVEY PARAMETERS:

Mean Terrain Clearance: 130 meters  
Helicopter: 130 meters  
Spectrometer: 130 meters  
Magnetometer:  
Traverse Line Direction: 90° (E-W)  
Control Line Direction: 0180° (N-S)  
Traverse Line Spacing: 400 m  
Control Line Spacing: 4000 m

#### AIRBORNE MAGNETOMETER SYSTEM:

Schintex CS - 3 Magnetometer Sensor and Fluxgate Mag. Bilingsley  
Configuration: Singer  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

#### AIRBORNE GAMMA-RAY SPECTROMETER:

RSK-5 multi-channel gamma-ray Spectrometer with 33.6 liters 'downward looking' NaI sensor and 8.4 liters 'upward looking' NaI sensor.  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

#### AIRBORNE NAVIGATION SYSTEM:

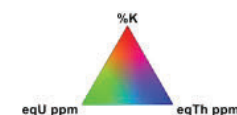
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 reading/second  
Digital Camera Garmin VIRB

#### LASER ALTIMETER:

Sampling Rate: 10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TV magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT

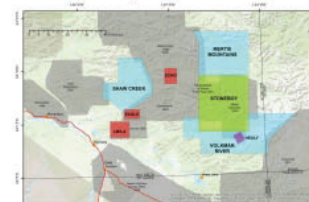


Relative regional location of survey areas



Contours: USGS Topo Map

Location of all the blocks collected



Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Ternary Map (%K - eqU ppm - eqTh ppm)

Mertie Mountains Block

Geophysical Report 2020-16

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# LEGEND

Survey Date: July 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

## SURVEY PARAMETERS:

Mean Terrain Clearance: 80 meters  
Helicopter: 80 meters  
Spectrometer: 80 meters  
Magnetometer: 80 meters  
Traverse Line Direction: 90° (E-W)  
Control Line Direction: 0100° (N-S)  
Traverse Line Spacing: 200 m  
Control Line Spacing: 2000 m

## AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS-3 Magnetometer Sensor  
and Fluegel Mag. Bingsley  
Configuration  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

## AIRBORNE GAMMA-RAY SPECTROMETER:

RSK-5 multi-channel gamma-ray  
Spectrometer with 33.6 liters "downward looking"  
NaI sensor and 8.4 liters "upward looking"  
NaI sensor  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

## AIRBORNE NAVIGATION SYSTEM:

Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VRB

## LASER ALTIMETER:

Sampling Rate: 10 readings/second

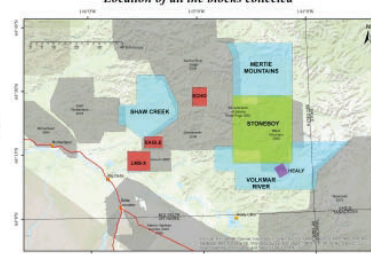
## BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT

## Relative regional location of survey areas



## Location of all the blocks collected



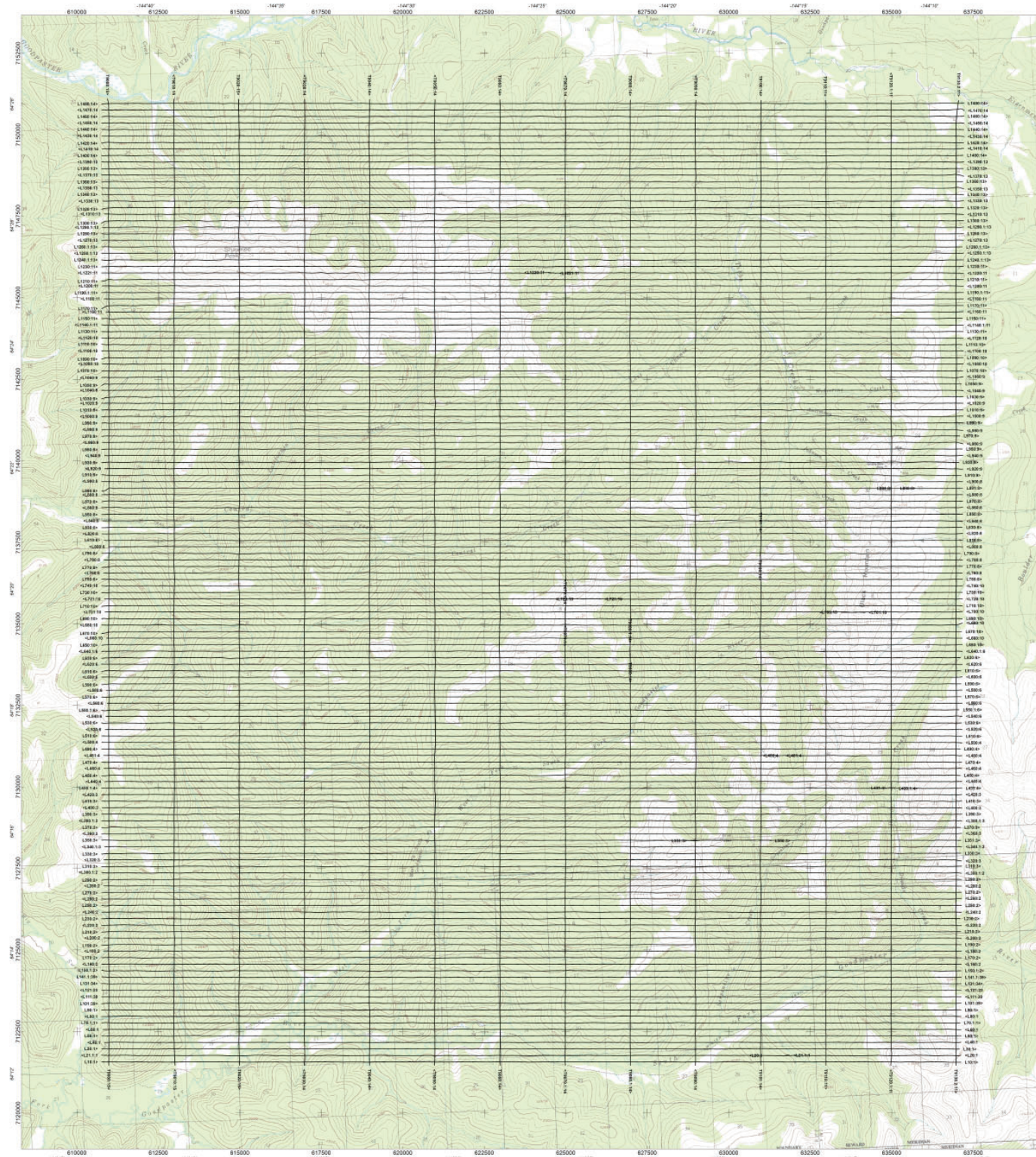
## Alaska Division of Geological & Geophysical Surveys

### Shaw Creek and Shawnee Peak Airborne Magnetic and Radiometric Geophysical Survey

### Flown Flight Path over USGS Topo Map

### Stoneboy Block

Geophysical Report 2020-16







# LEGEND

Survey Date: July 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

## SURVEY PARAMETERS:

Mean Terrain Clearance: 80 meters  
Helicopter: 80 meters  
Spectrometer: 80 meters  
Magnetometer: 80 meters  
Traverse Line Direction: 90° (E-W)  
Control Line Direction: 0180° (N-S)  
Traverse Line Spacing: 200 m  
Control Line Spacing: 2000 m

## AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS-3 Magnetometer Sensor and Fluxgate Mag. Bifilarley  
Configuration: Stinger  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

## AIRBORNE GAMMA-RAY SPECTROMETER:

RSK-5 multi-channel gamma-ray Spectrometer with 33.6 liters "downward looking" NaI sensor and 8.4 liters "upward looking" NaI sensor  
Temperature/Humidity: Vaisala  
Sampling Rate: 1 reading/second

## AIRBORNE NAVIGATION SYSTEM:

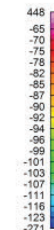
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VRB

## LASER ALTIMETER:

Sampling Rate: 10 readings/second

## BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT



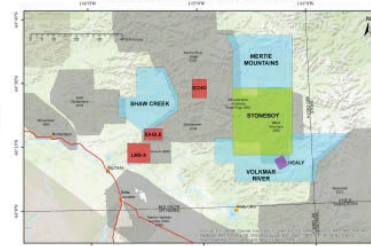
## Residual Magnetic Intensity (nT)

Contours: USGS Topo Map

## Relative regional location of survey areas



## Location of all the blocks collected



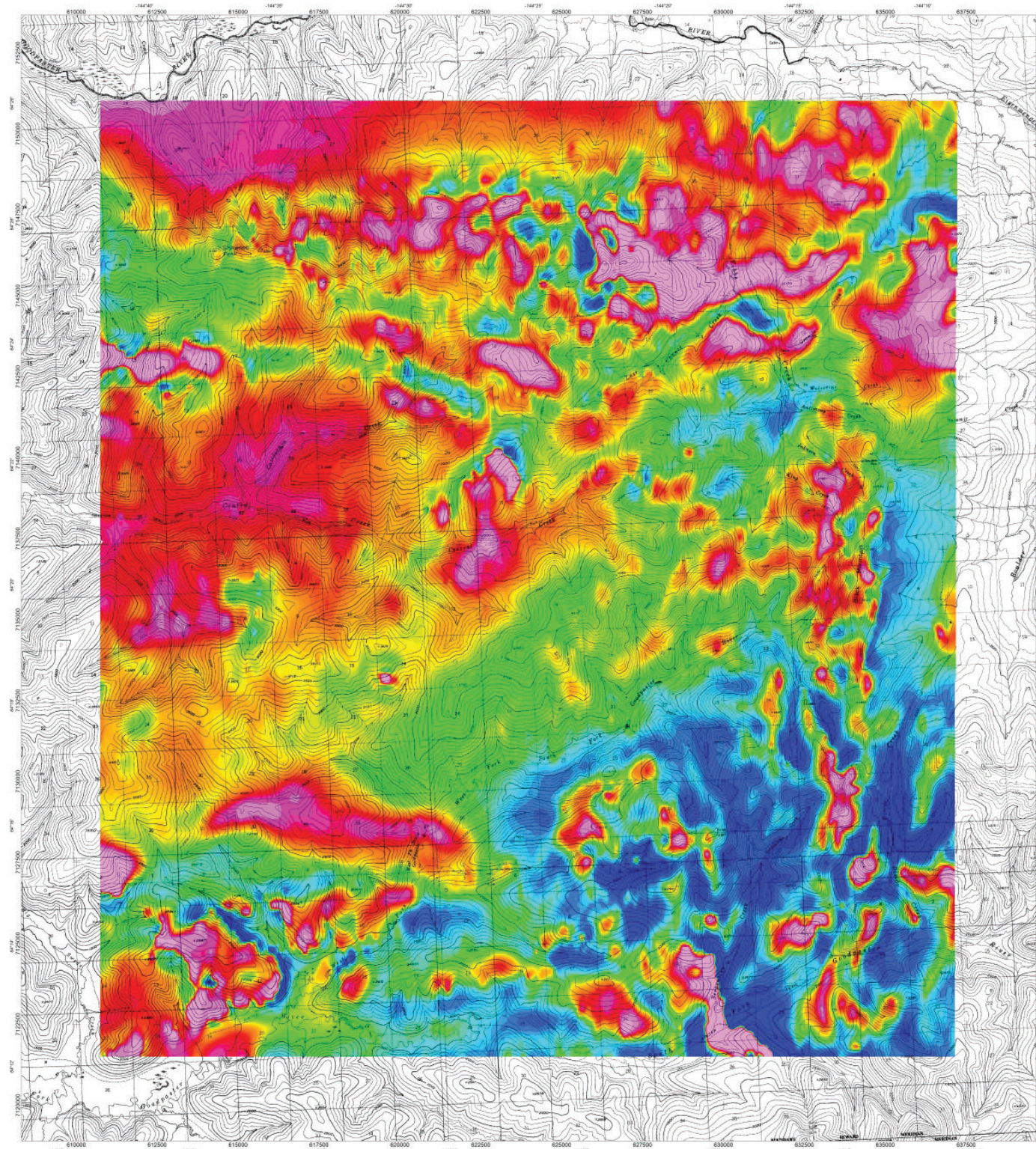
## Alaska Division of Geological & Geophysical Surveys

### Shaw Creek and Shawnee Peak Airborne Magnetic and Radiometric Geophysical Survey

### Residual Magnetic Intensity Map

### Stoneboy Block

Geophysical Report 2020-16







# LEGEND

Survey Date: July 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

## SURVEY PARAMETERS:

Mean Terrain Clearance: 80 meters  
Helicopter: 80 meters  
Spectrometer: 80 meters  
Magnetometer: 80 meters  
Traverse Line Direction: 90° (E-W)  
Control Line Direction: 0100° (N-S)  
Traverse Line Spacing: 200 m  
Control Line Spacing: 2000 m

## AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS - 3 Magnetometer Sensor and Fluxgate Mag. Bifilarity  
Configuration: Stinger  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

## AIRBORNE GAMMA-RAY SPECTROMETER:

RSK-5 multi-channel gamma-ray Spectrometer with 33.6 liters "downward looking" NaI sensor and 8.4 liters "upward looking" NaI sensor  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

## AIRBORNE NAVIGATION SYSTEM:

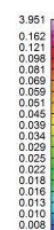
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VRB

## LASER ALTIMETER:

Sampling Rate: 10 readings/second

## BASE STATION MAGNETOMETER:

GEM GSM-18TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT



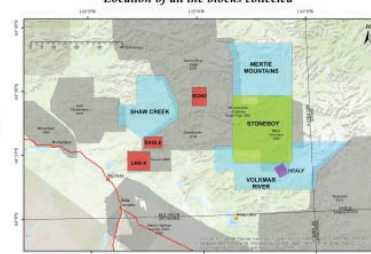
Analytic Signal (nT/m)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



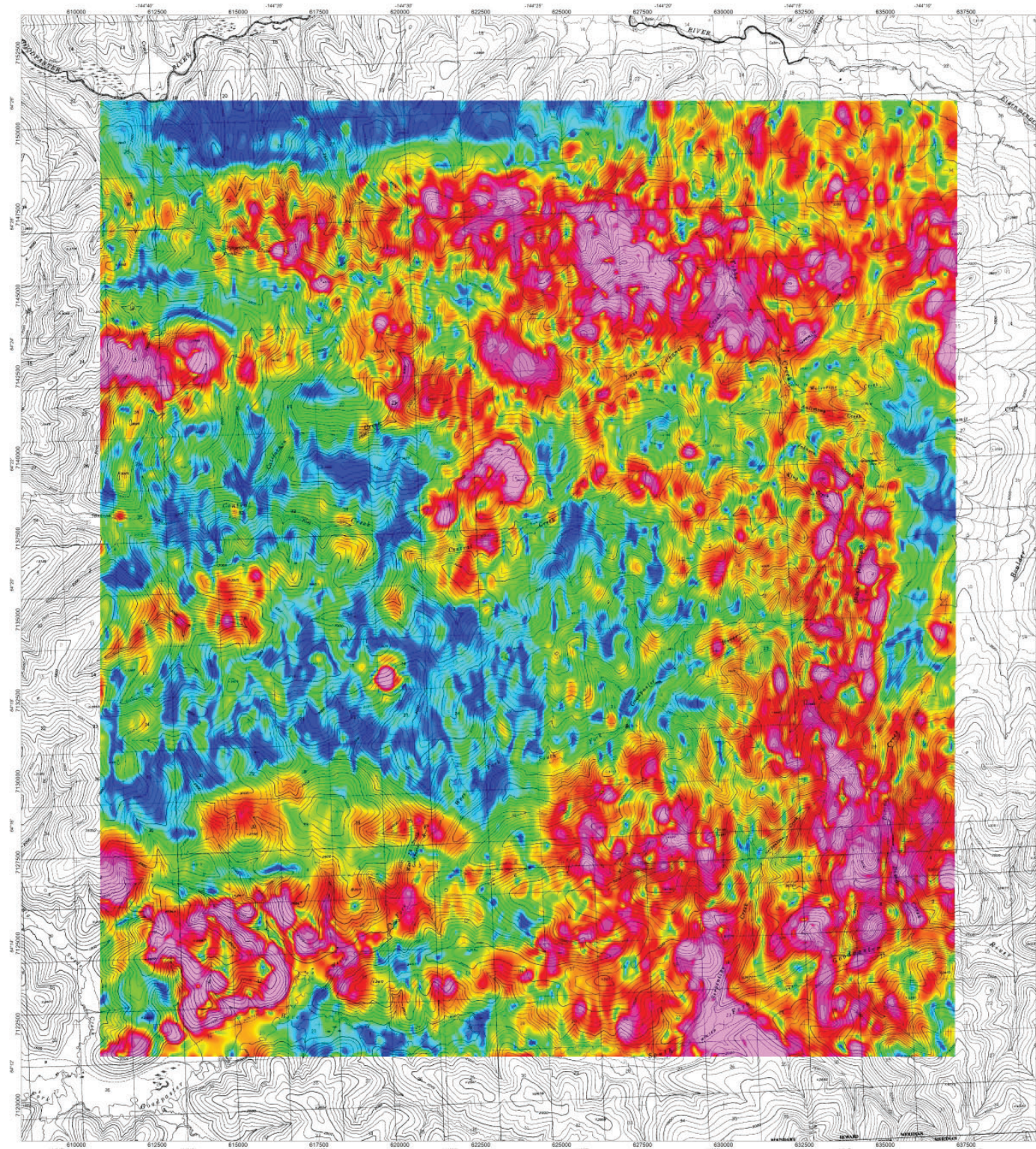
Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne Magnetic and Radiometric Geophysical Survey

Analytic Signal Map

Stoneboy Block

Geophysical Report 2020-16







# LEGEND

Survey Date: July 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

## SURVEY PARAMETERS:

Mean Terrain Clearance: 80 meters  
Helicopter: 80 meters  
Spectrometer: 80 meters  
Magnetometer: 80 meters  
Traverse Line Direction: 90° (E-W)  
Control Line Direction: 0180° (N-S)  
Traverse Line Spacing: 200 m  
Control Line Spacing: 2000 m

## AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS - 3 Magnetometer Sensor and Flangeable Mag. Bingsley Configuration  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

## AIRBORNE GAMMA-RAY SPECTROMETER:

RSK-5 multi-channel gamma-ray Spectrometer with 33.6 liters "downward looking" NaI sensor and 8.4 liters "upward looking" NaI sensor  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

## AIRBORNE NAVIGATION SYSTEM:

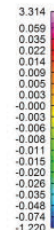
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VRB

## LASER ALTIMETER:

Sampling Rate: 10 readings/second

## BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT



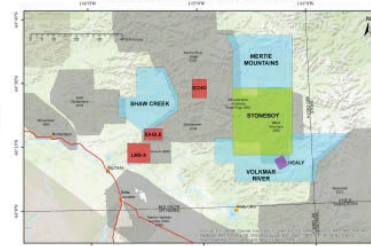
Calculated 1st Vertical Derivative (nT/m)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



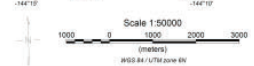
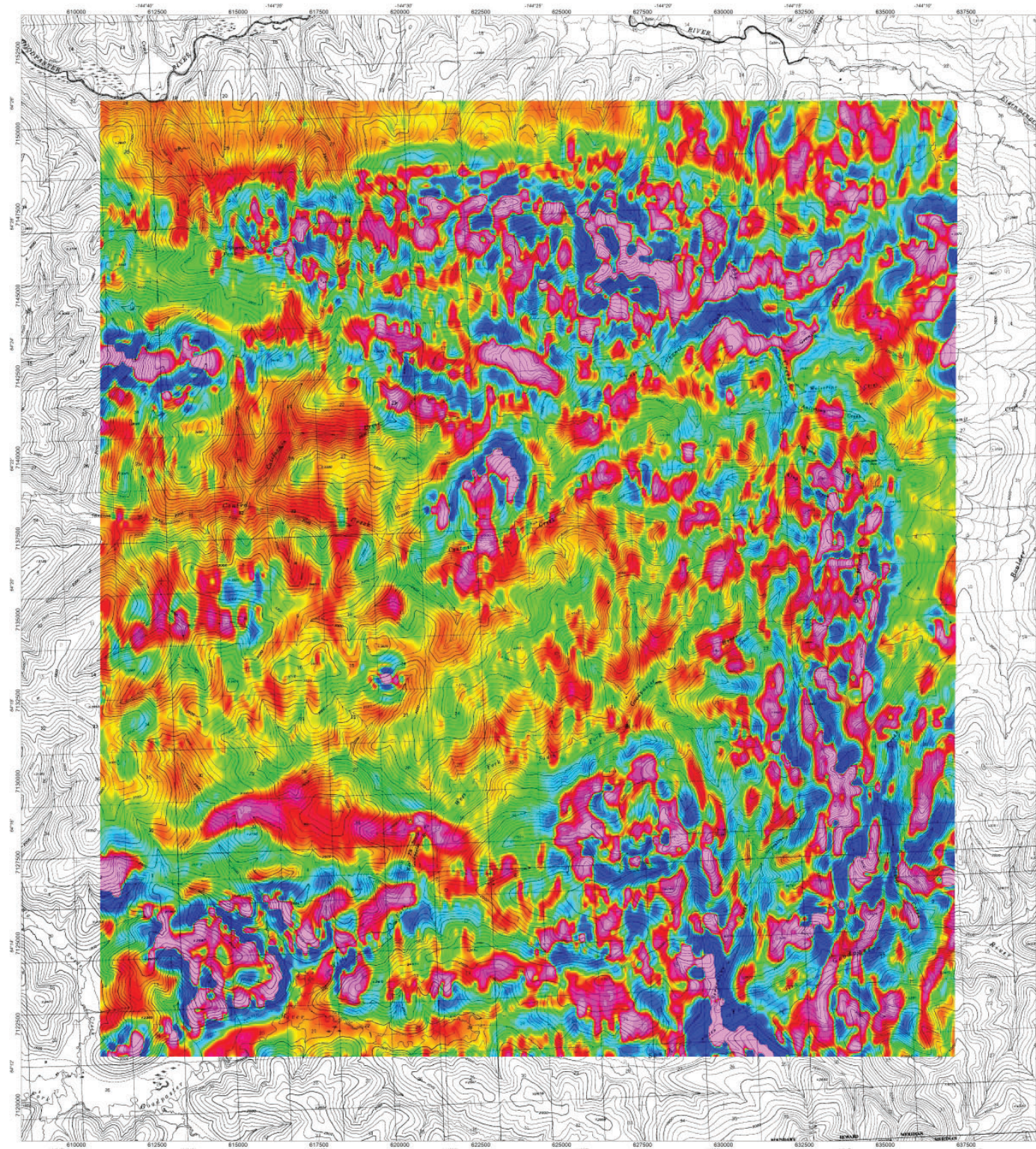
Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne Magnetic and Radiometric Geophysical Survey

Calculated 1st Vertical Derivative Map

Stoneboy Block

Geophysical Report 2020-16







# LEGEND

Survey Date: July 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

## SURVEY PARAMETERS:

Mean Terrain Clearance: 80 meters  
Helicopter: 80 meters  
Spectrometer: 80 meters  
Magnetometer: 80 meters  
Traverse Line Direction: 90° (E-W)  
Control Line Direction: 0180° (N-S)  
Traverse Line Spacing: 200 m  
Control Line Spacing: 2000 m

## AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS-3 Magnetometer Sensor  
and Fluxgate Mag. Bifilarley  
Configuration  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

## AIRBORNE GAMMA-RAY SPECTROMETER:

RSK-5 multi-channel gamma-ray  
Spectrometer with 33.6 liters "downward looking"  
NaI sensor and 8.4 liters "upward looking"  
NaI sensor  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

## AIRBORNE NAVIGATION SYSTEM:

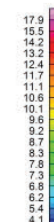
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VRB

## LASER ALTIMETER:

Sampling Rate: 10 readings/second

## BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT



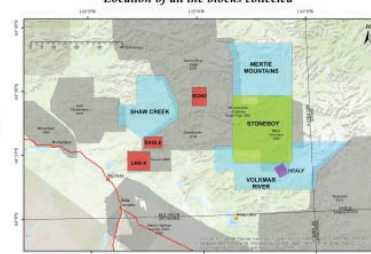
Thorium  
(eqTh ppm)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



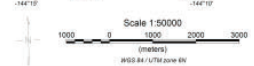
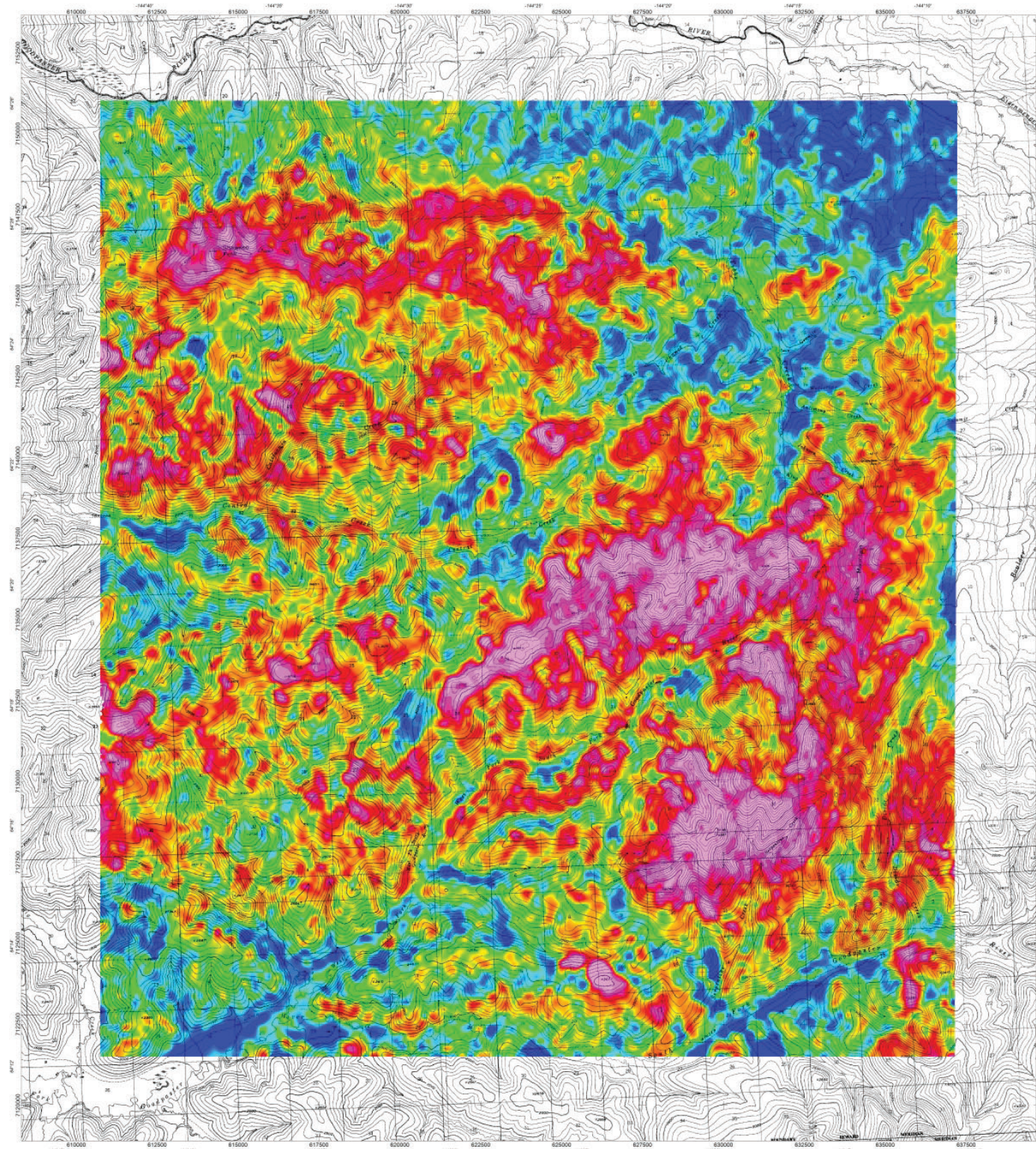
Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Thorium Map (eqTh ppm)

Stoneboy Block

Geophysical Report 2020-16







# LEGEND

Survey Date: July 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

## SURVEY PARAMETERS:

Mean Terrain Clearance: 80 meters  
Helicopter: 80 meters  
Spectrometer: 80 meters  
Magnetometer: 80 meters  
Traverse Line Direction: 90° (E-W)  
Control Line Direction: 0100° (N-S)  
Traverse Line Spacing: 200 m  
Control Line Spacing: 2000 m

## AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS-3 Magnetometer Sensor and Fluxgate Mag. Bifilarley  
Configuration: Stinger  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

## AIRBORNE GAMMA-RAY SPECTROMETER:

RSK-5 multi-channel gamma-ray Spectrometer with 33.6 liters "downward looking" NaI sensor and 8.4 liters "upward looking" NaI sensor  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

## AIRBORNE NAVIGATION SYSTEM:

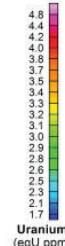
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VRB

## LASER ALTIMETER:

Sampling Rate: 10 readings/second

## BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT

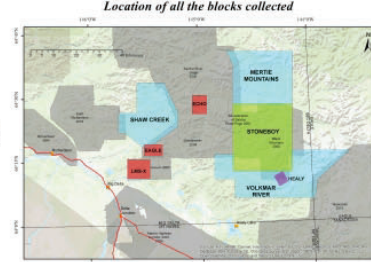


Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



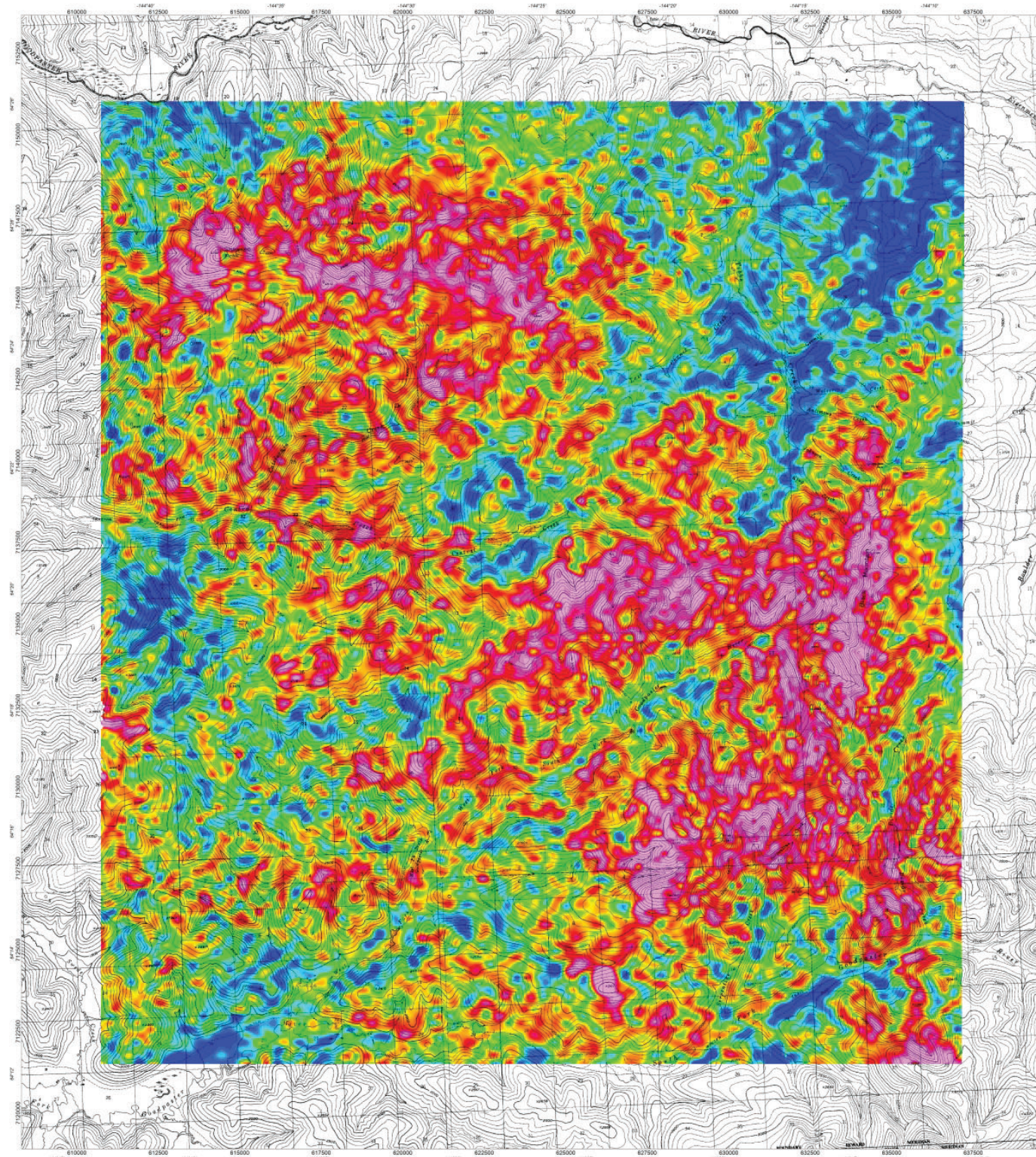
Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Uranium Map (eqU ppm)

Stoneboy Block

Geophysical Report 2020-16







# LEGEND

Survey Date: July 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

## SURVEY PARAMETERS:

Mean Terrain Clearance: 80 meters  
Helicopter: 80 meters  
Spectrometer: 80 meters  
Magnetometer: 80 meters  
Traverse Line Direction: 90° (E-W)  
Control Line Direction: 0180° (N-S)  
Traverse Line Spacing: 200 m  
Control Line Spacing: 2000 m

## AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS - 3 Magnetometer Sensor and Fluxgate Mag. Bingsley Configuration  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

## AIRBORNE GAMMA-RAY SPECTROMETER:

RSK-5 multi-channel gamma-ray Spectrometer with 33.6 liters "downward looking" NaI sensor and 8.4 liters "upward looking" NaI sensor  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

## AIRBORNE NAVIGATION SYSTEM:

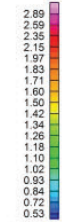
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VRB

## LASER ALTIMETER:

Sampling Rate: 10 readings/second

## BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT



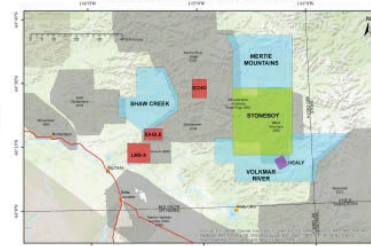
Potassium (K%)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



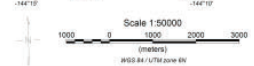
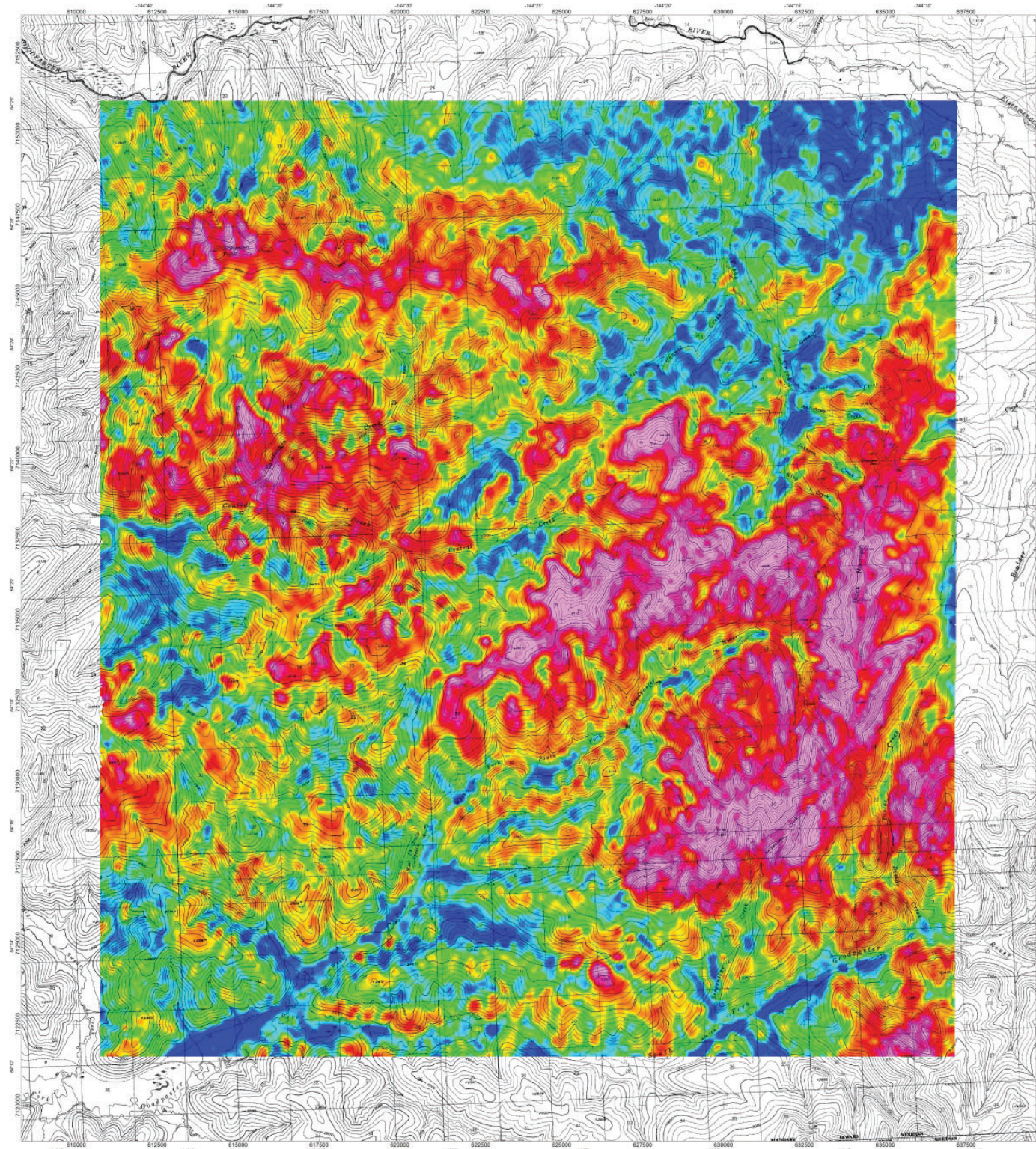
Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne Magnetic and Radiometric Geophysical Survey

Potassium Map (K%)

Stoneboy Block

Geophysical Report 2020-16







# LEGEND

Survey Date: July 2020  
Helicopter Type: AS300B2  
Registration: C-GSVY

## SURVEY PARAMETERS:

Mean Terrain Clearance: 80 meters  
Helicopter: 80 meters  
Spectrometer: 80 meters  
Magnetometer: 80 meters  
Traverse Line Direction: 90° (E-W)  
Control Line Direction: 0100° (N-S)  
Traverse Line Spacing: 200 m  
Control Line Spacing: 2000 m

## AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS - 3 Magnetometer Sensor and Fluxgate Mag. Bingsley Configuration  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

## AIRBORNE GAMMA-RAY SPECTROMETER:

RSK-5 multi-channel gamma-ray Spectrometer with 33.6 liters "downward looking" NaI sensor and 8.4 liters "upward looking" NaI sensor  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

## AIRBORNE NAVIGATION SYSTEM:

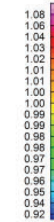
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VRB

## LASER ALTIMETER:

Sampling Rate: 10 readings/second

## BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT



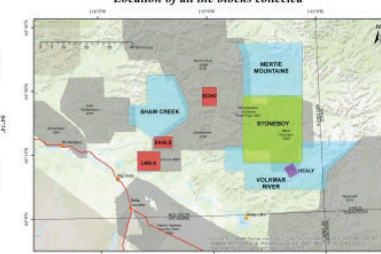
Ratio Potassium / Thorium  
(K% / eqTh ppm)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



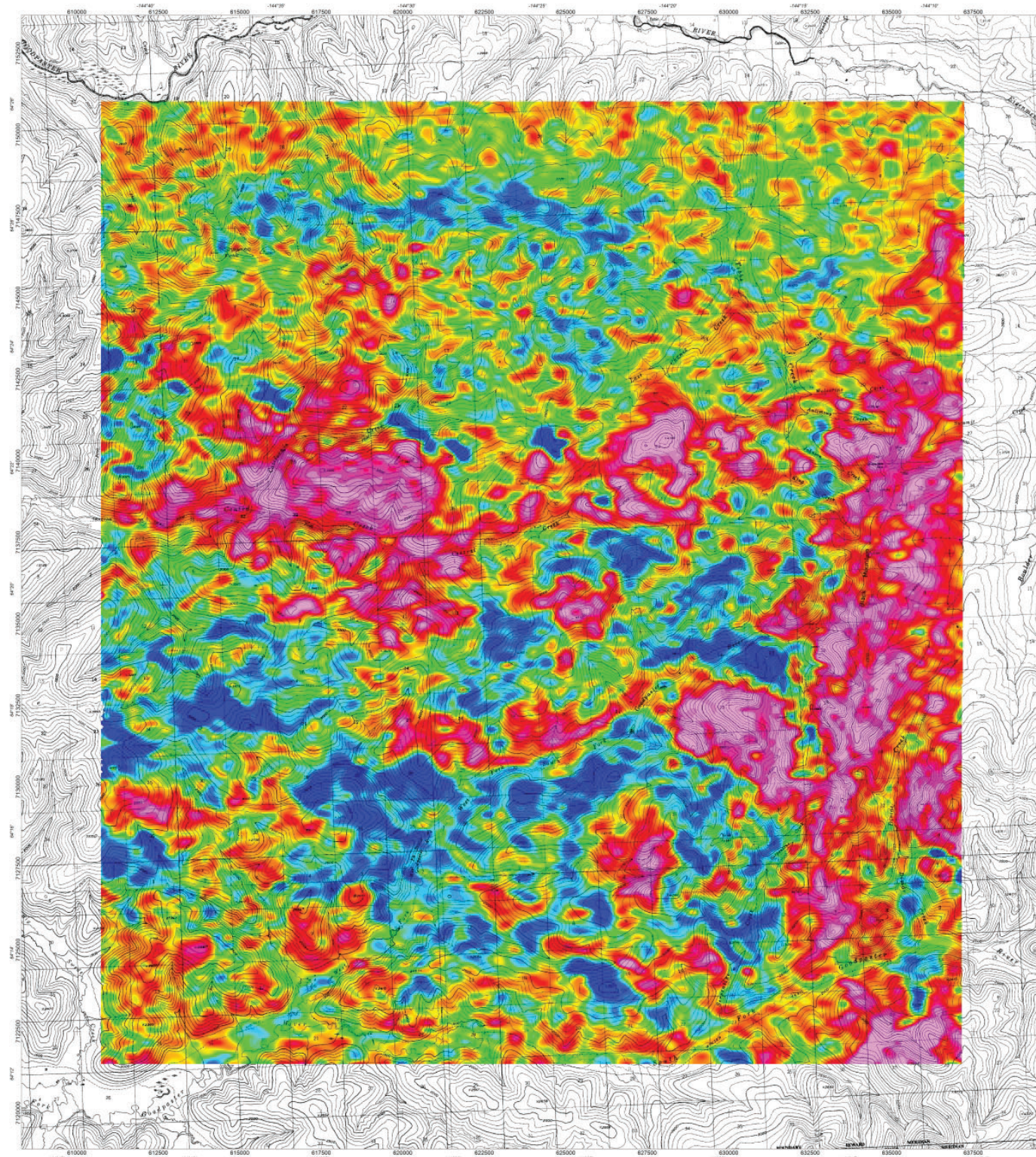
Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Ratio Potassium/Thorium Map (K/eqTh)

Stoneboy Block

Geophysical Report 2020-16







# LEGEND

Survey Date: July 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

## SURVEY PARAMETERS:

Mean Terrain Clearance: 80 meters  
Helicopter: 80 meters  
Spectrometer: 80 meters  
Magnetometer: 80 meters  
Traverse Line Direction: 90° (E-W)  
Control Line Direction: 0100° (N-S)  
Traverse Line Spacing: 200 m  
Control Line Spacing: 2000 m

## AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS - 3 Magnetometer Sensor  
and Flügge Mag. Binsley  
Configuration: Stinger  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

## AIRBORNE GAMMA-RAY SPECTROMETER:

RSK-5 multi-channel gamma-ray  
Spectrometer with 33.6 liters "downward looking"  
NaI sensor and 8.4 liters "upward looking"  
NaI sensor  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

## AIRBORNE NAVIGATION SYSTEM:

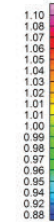
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VRB

## LASER ALTIMETER:

Sampling Rate: 10 readings/second

## BASE STATION MAGNETOMETER:

GEM GSM-18TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT



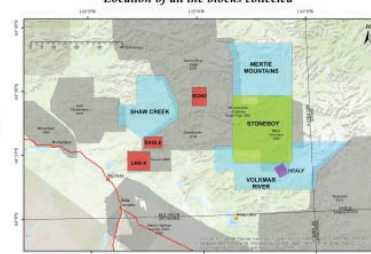
Ratio Uranium / Thorium  
(eqU ppm / eqTh ppm)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



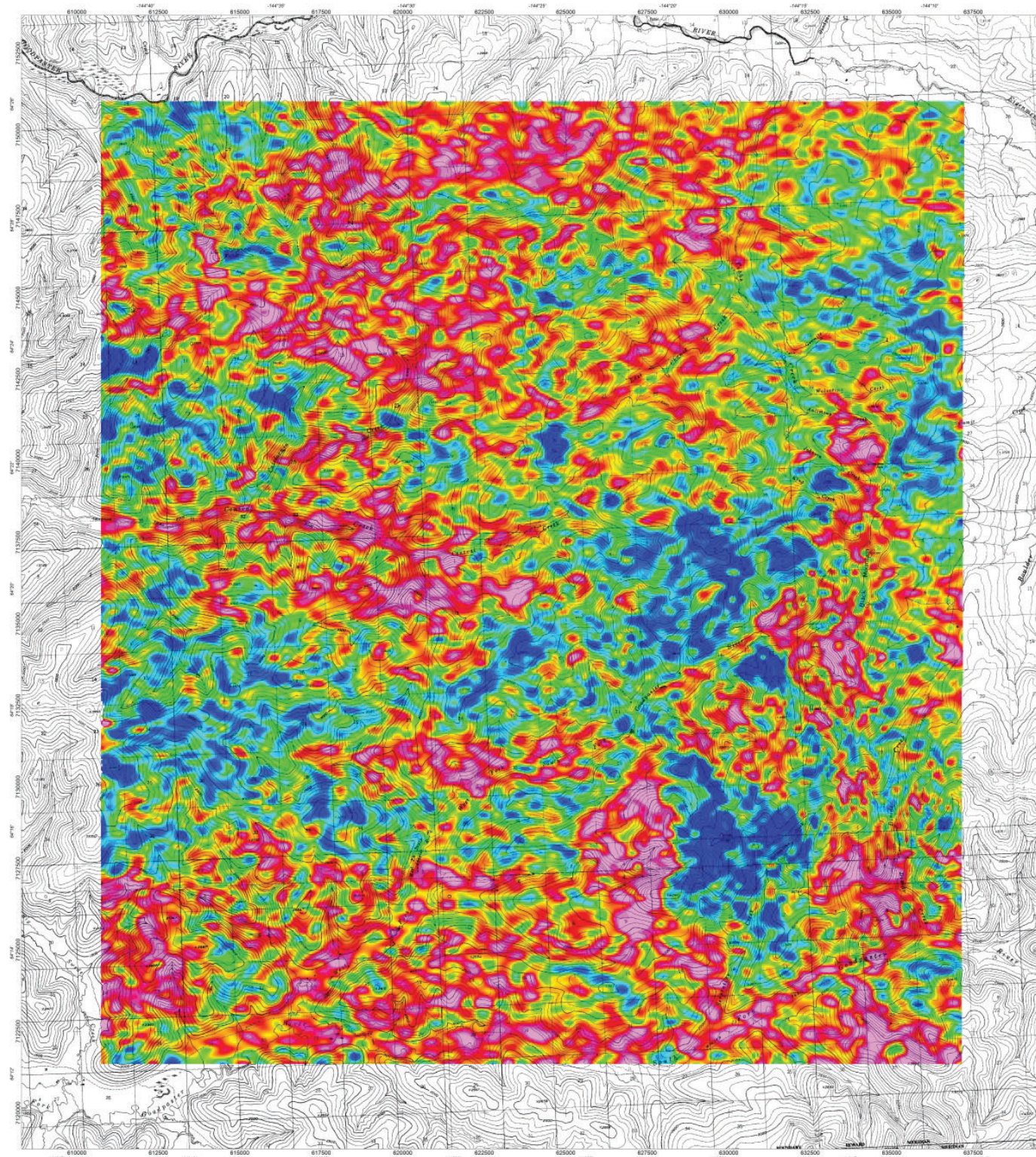
Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Ratio Uranium/Thorium Map (eqU/eqTh)

Stoneboy Block

Geophysical Report 2020-16







# LEGEND

Survey Date: July 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

## SURVEY PARAMETERS:

Mean Terrain Clearance: 80 meters  
Helicopter: 80 meters  
Spectrometer: 80 meters  
Magnetometer: 80 meters  
Traverse Line Direction: 90° (E-W)  
Control Line Direction: 0100° (N-S)  
Traverse Line Spacing: 200 m  
Control Line Spacing: 2000 m

## AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS-3 Magnetometer Sensor  
and Flange Mag. Bifilar  
Configuration: Stinger  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

## AIRBORNE GAMMA-RAY SPECTROMETER:

RSK-5 multi-channel gamma-ray  
Spectrometer with 33.6 liters "downward looking"  
NaI sensor and 8.4 liters "upward looking"  
NaI sensor  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

## AIRBORNE NAVIGATION SYSTEM:

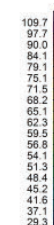
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VRB

## LASER ALTIMETER:

Sampling Rate: 10 readings/second

## BASE STATION MAGNETOMETER:

GEM GSM-18TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT



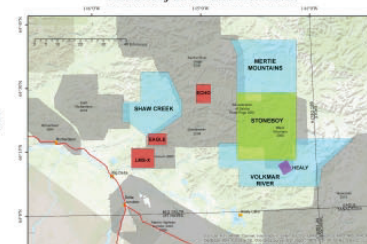
Total Air Absorbed Dose Rate  
(nGy/h)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



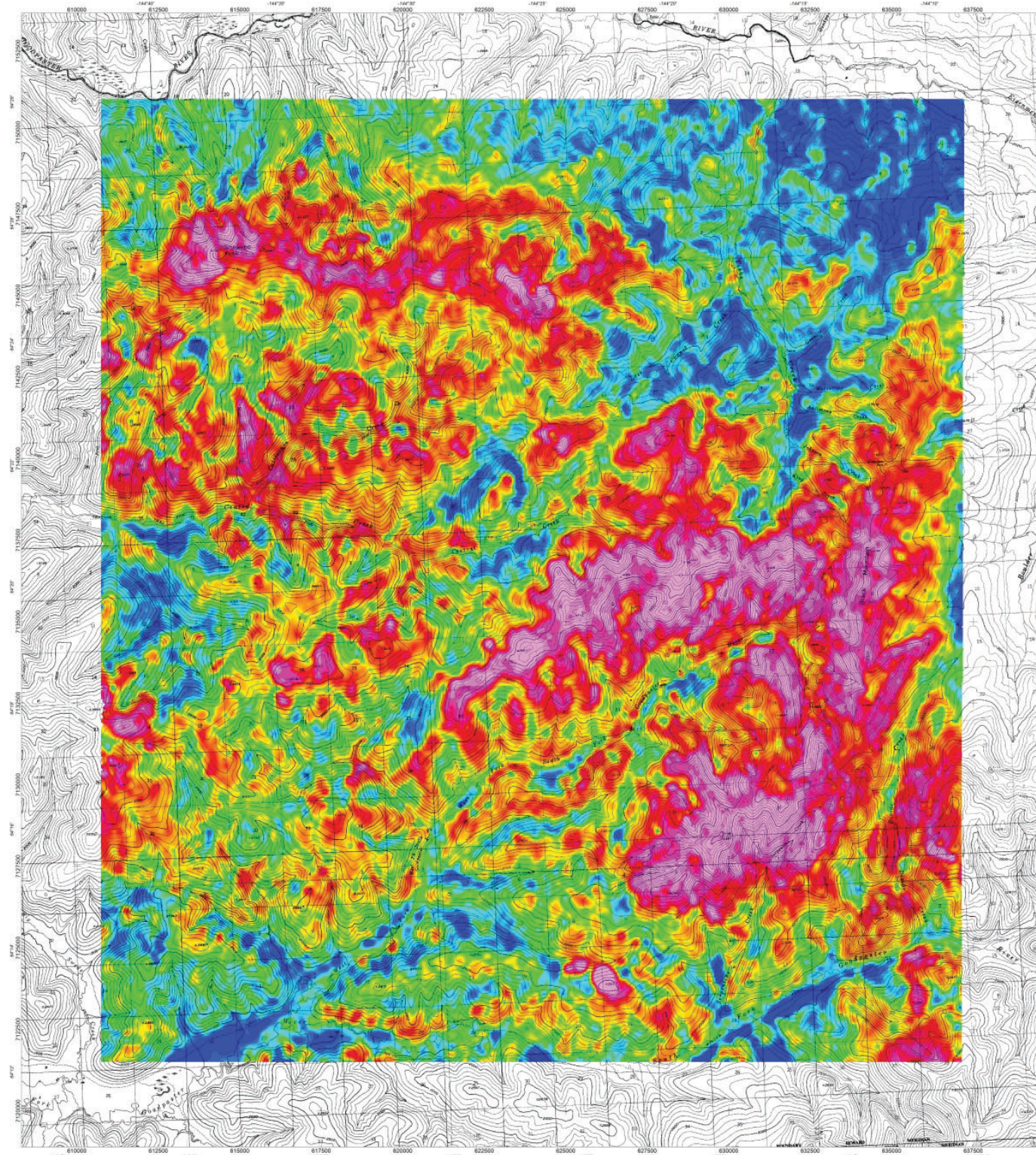
Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Total Air Absorbed Dose Rate Map (Taadr)

Stoneboy Block

Geophysical Report 2020-16







# LEGEND

Survey Date: July 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

## SURVEY PARAMETERS:

Mean Terrain Clearance: 80 meters  
Helicopter: 80 meters  
Spectrometer: 80 meters  
Magnetometer: 80 meters  
Traverse Line Direction: 90° (E-W)  
Control Line Direction: 0180° (N-S)  
Traverse Line Spacing: 200 m  
Control Line Spacing: 2000 m

## AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS - 3 Magnetometer Sensor  
and Fluxgate Mag. Bifurcated  
Configuration  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

## AIRBORNE GAMMA-RAY SPECTROMETER:

RSK-5 multi-channel gamma-ray  
Spectrometer with 33.6 liters "downward looking"  
NaI sensor and 8.4 liters "upward looking"  
NaI sensor  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

## AIRBORNE NAVIGATION SYSTEM:

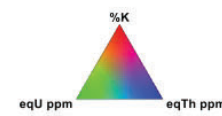
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VRB

## LASER ALTIMETER:

Sampling Rate: 10 readings/second

## BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT

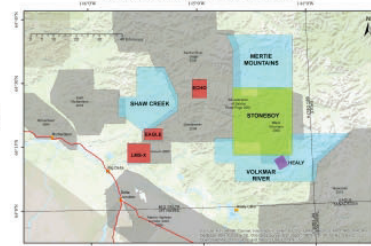


Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



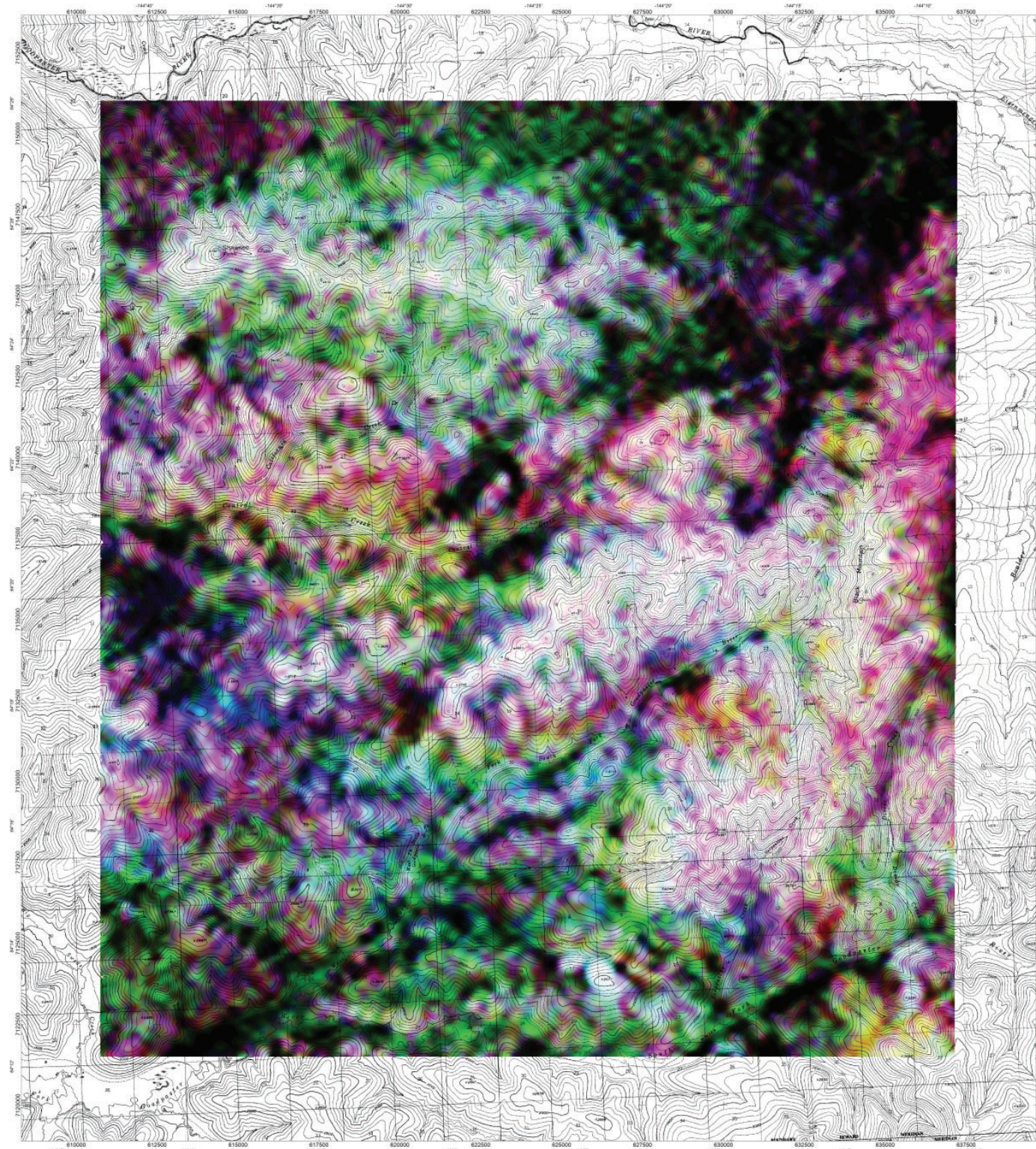
Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Ternary Map (%K - eqU ppm - eqTh ppm)

Stoneboy Block

Geophysical Report 2020-16







# LEGEND

Survey Date: July, 2020  
Helicopter Type: AS350B2  
Registration: C-GSVY

## SURVEY PARAMETERS:

Mean Terrain Clearance: 130 meters  
Helicopter: 130 meters  
Spectrometer: 130 meters  
Magnetometer: 130 meters  
Traverse Line Direction: 0/180° (N-S)  
Control Line Direction: 90° (E-W)  
Traverse Line Spacing: 400 m  
Control Line Spacing: 4000 m

## AIRBORNE MAGNETOMETER SYSTEM:

Scintrex CS-3 Magnetometer Sensor and Fluxgate Mag. Biliingale  
Configuration: Stinger  
Sampling Rate: 20 readings/second  
Sensitivity: 0.01 nT

## AIRBORNE GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel gamma-ray Spectrometer with 33.6 liters "downward looking" NaI sensor and 8.4 liters "upward looking" NaI sensor.  
Temperature/Humidity - Vaisala  
Sampling Rate: 1 reading/second

## AIRBORNE NAVIGATION SYSTEM:

Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VIRB

## LASER ALTIMETER:

Sampling Rate: 10 readings/second

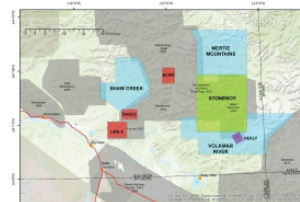
## BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT

## Relative regional location of survey areas



## Location of all the blocks collected



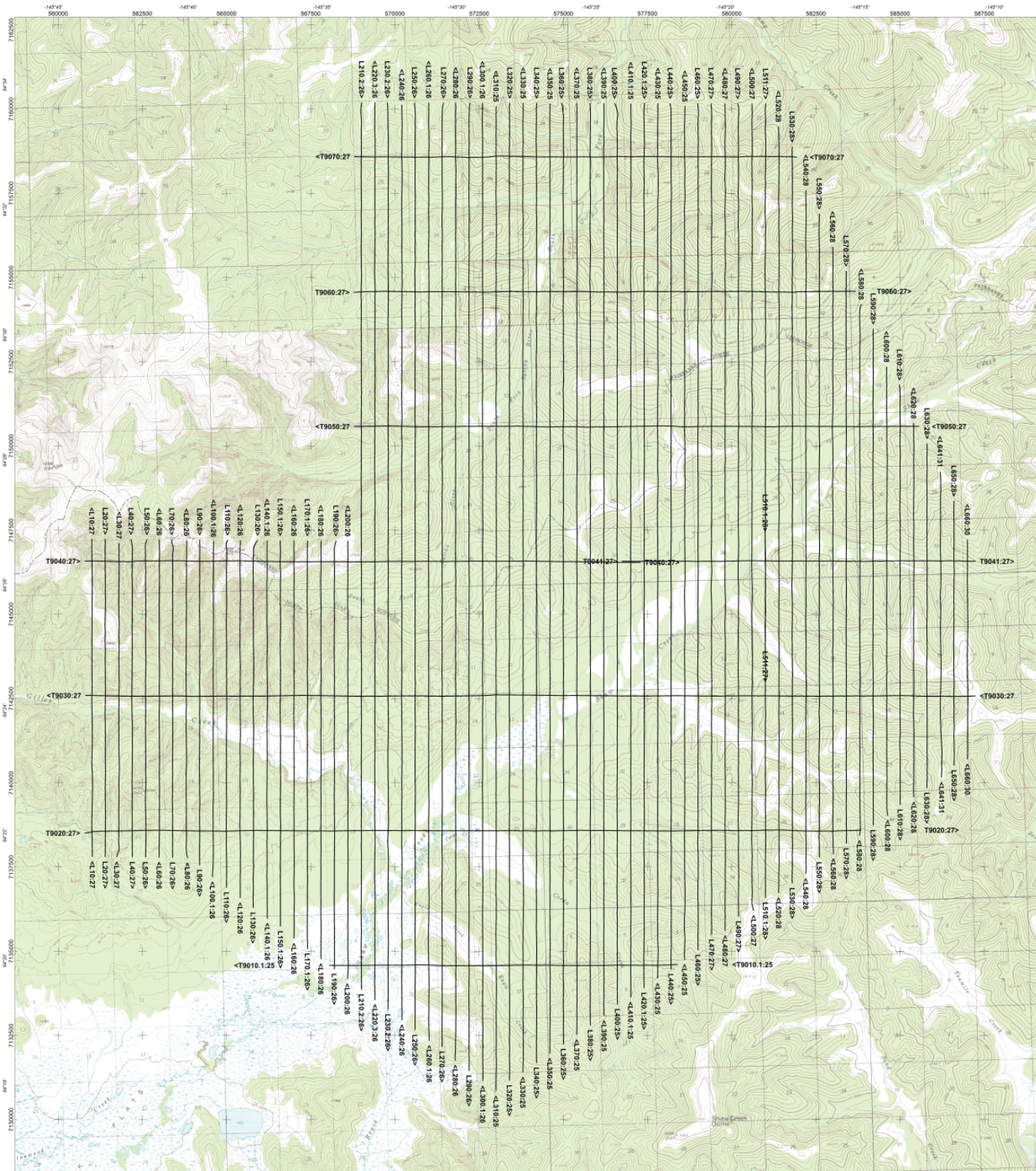
## Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

## Flown Flight Path over USGS Topo Map

Shaw Creek Block

Geophysical Report 2020-16







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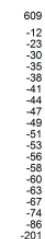
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VIRB

#### LASER ALTIMETER:

Sampling Rate: 10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT



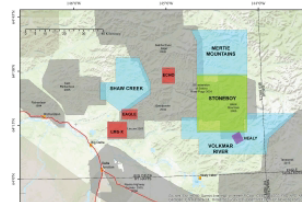
Residual Magnetic Intensity  
(nT)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



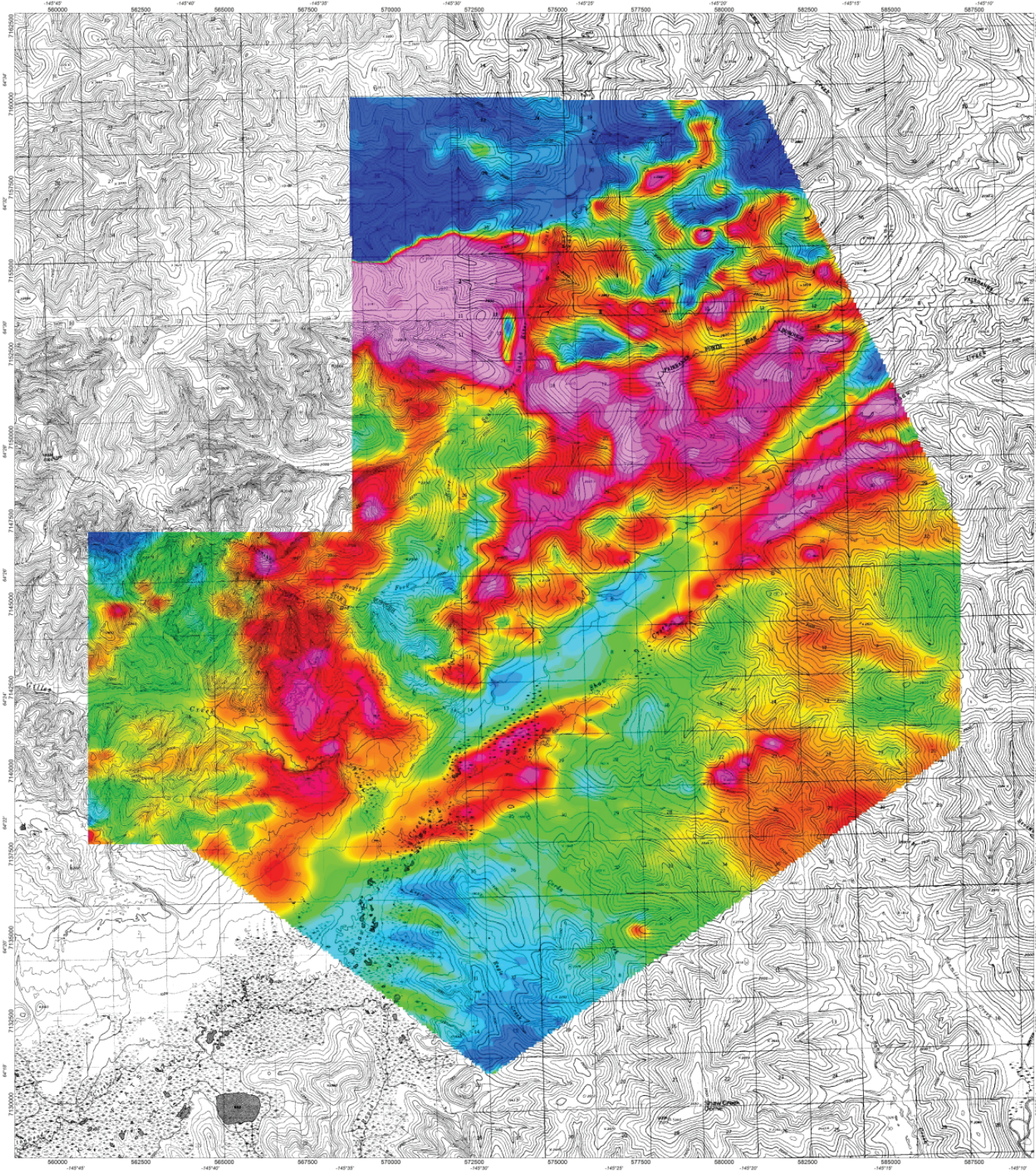
Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
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Residual Magnetic Intensity Map

Shaw Creek Block

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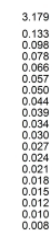
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VIRB

#### LASER ALTIMETER:

Sampling Rate: 10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT



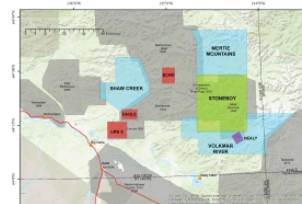
Analytic Signal  
(nT/m)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



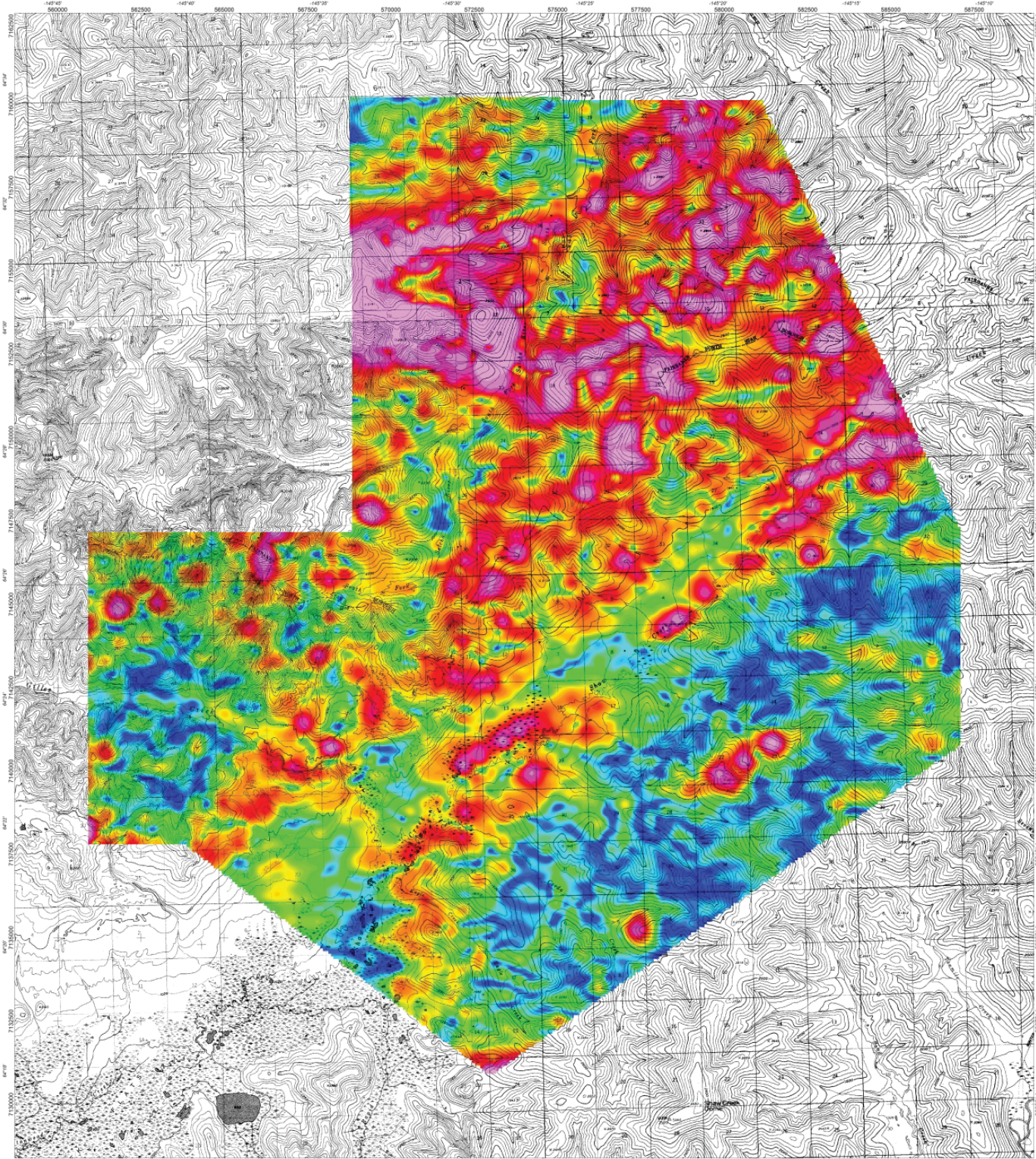
Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Analytic Signal Map

Shaw Creek Block

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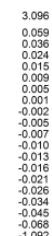
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VIRB

#### LASER ALTIMETER:

Sampling Rate: 10 readings/second

#### BASE STATION MAGNETOMETER:

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Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT



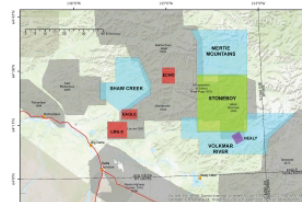
Calculated 1st Vertical Derivative  
(nT/m)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



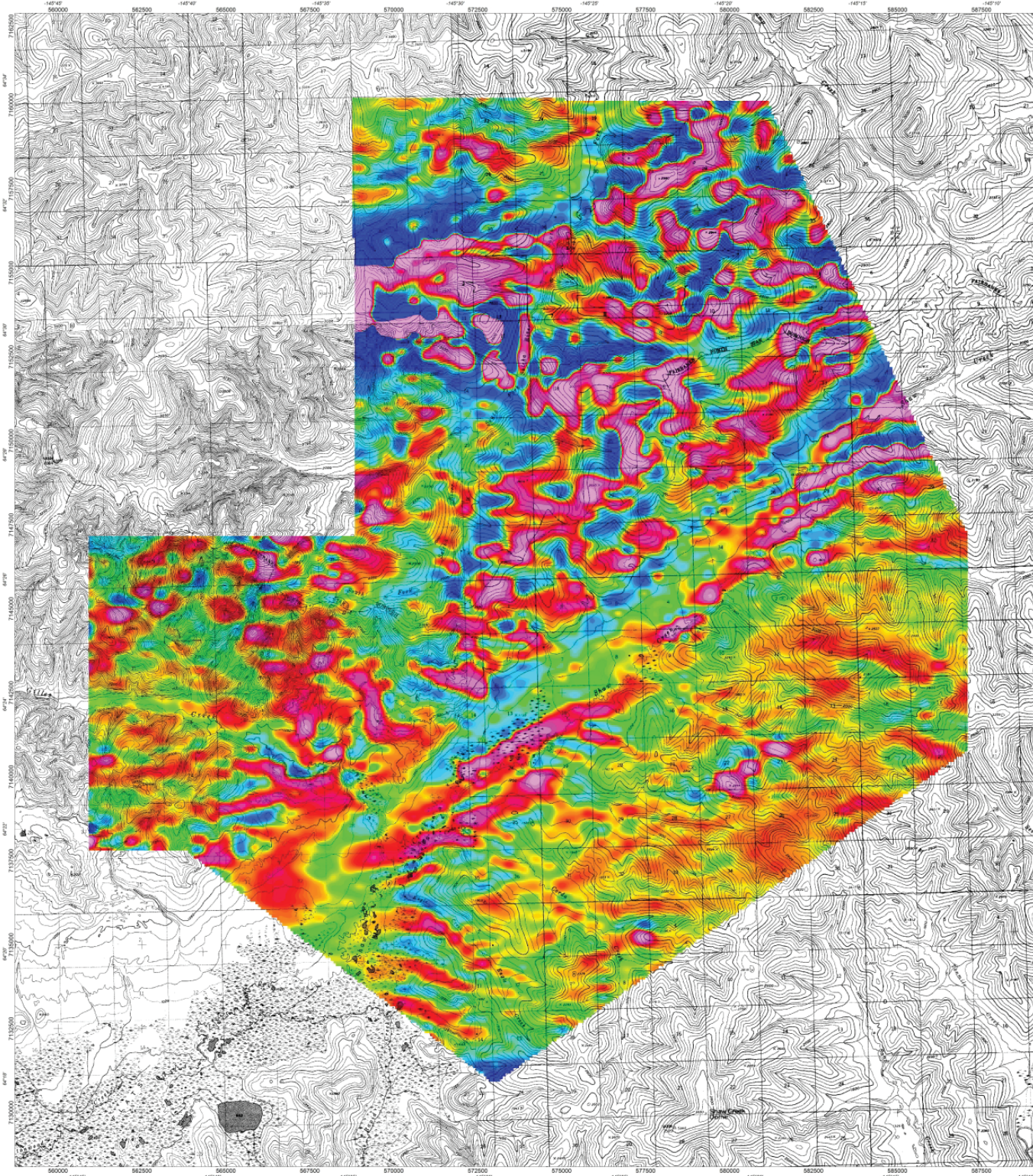
Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Calculated 1st Vertical Derivative Map

Shaw Creek Block

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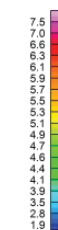
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VIRB

#### LASER ALTIMETER:

Sampling Rate: 10 readings/second

#### BASE STATION MAGNETOMETER:

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Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT



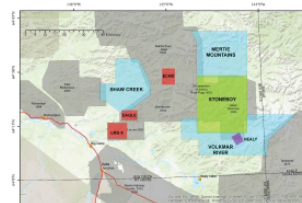
Thorium  
(eqTh ppm)

Contours: USGS Topo Map

#### Relative regional location of survey areas



#### Location of all the blocks collected



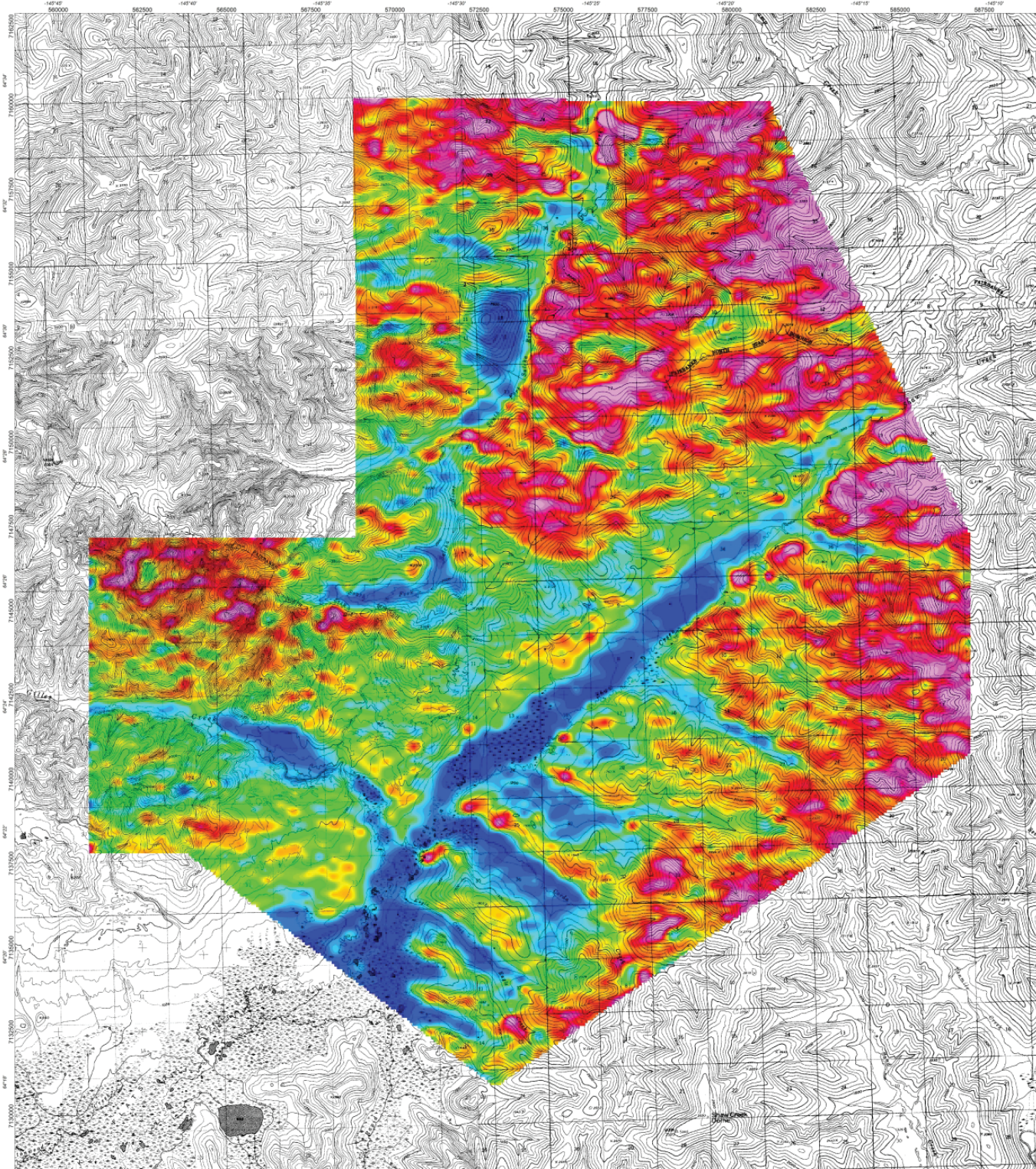
#### Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

#### Thorium Map (eqTh ppm)

Shaw Creek Block

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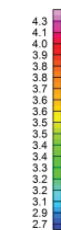
Hemisphere R320 GPS L1/L2  
Sampling Rate: 5 readings/second  
Digital Camera Garmin VIRB

#### LASER ALTIMETER:

Sampling Rate: 10 readings/second

#### BASE STATION MAGNETOMETER:

GEM GSM-19TW magnetometer  
Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT



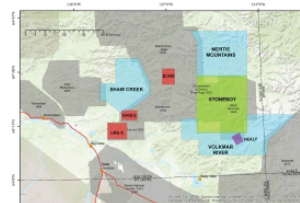
Uranium  
(eqU ppm)

Contours: USGS Topo Map

#### Relative regional location of survey areas



#### Location of all the blocks collected



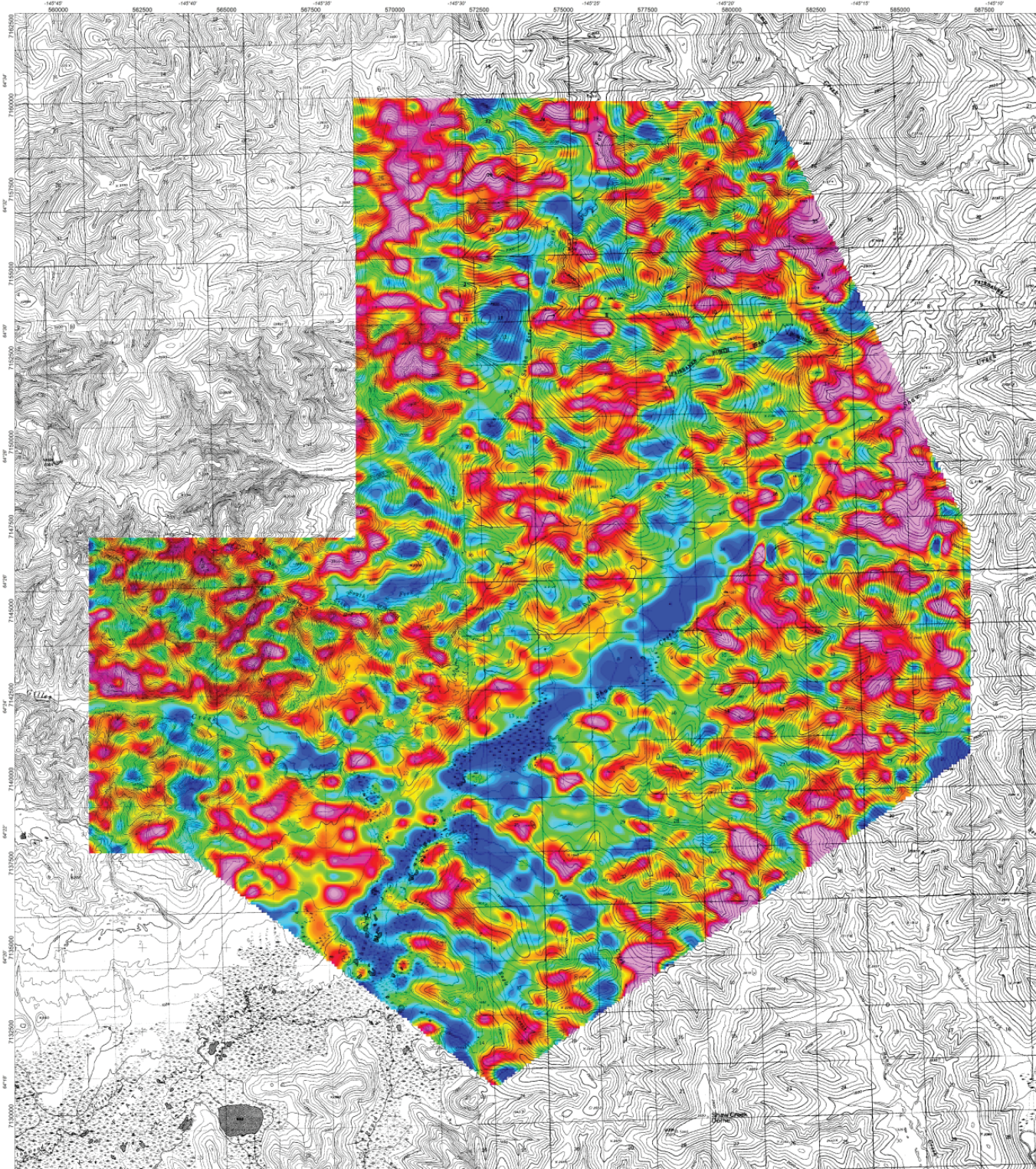
#### Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

#### Uranium Map (eqU ppm)

Shaw Creek Block

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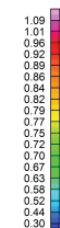
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Digital Camera Garmin VIRB

#### LASER ALTIMETER:

Sampling Rate: 10 readings/second

#### BASE STATION MAGNETOMETER:

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Sampling Rate: 1 reading/second  
Sensitivity: 0.022 nT



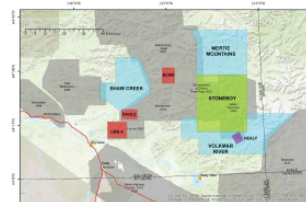
Potassium  
(K%)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



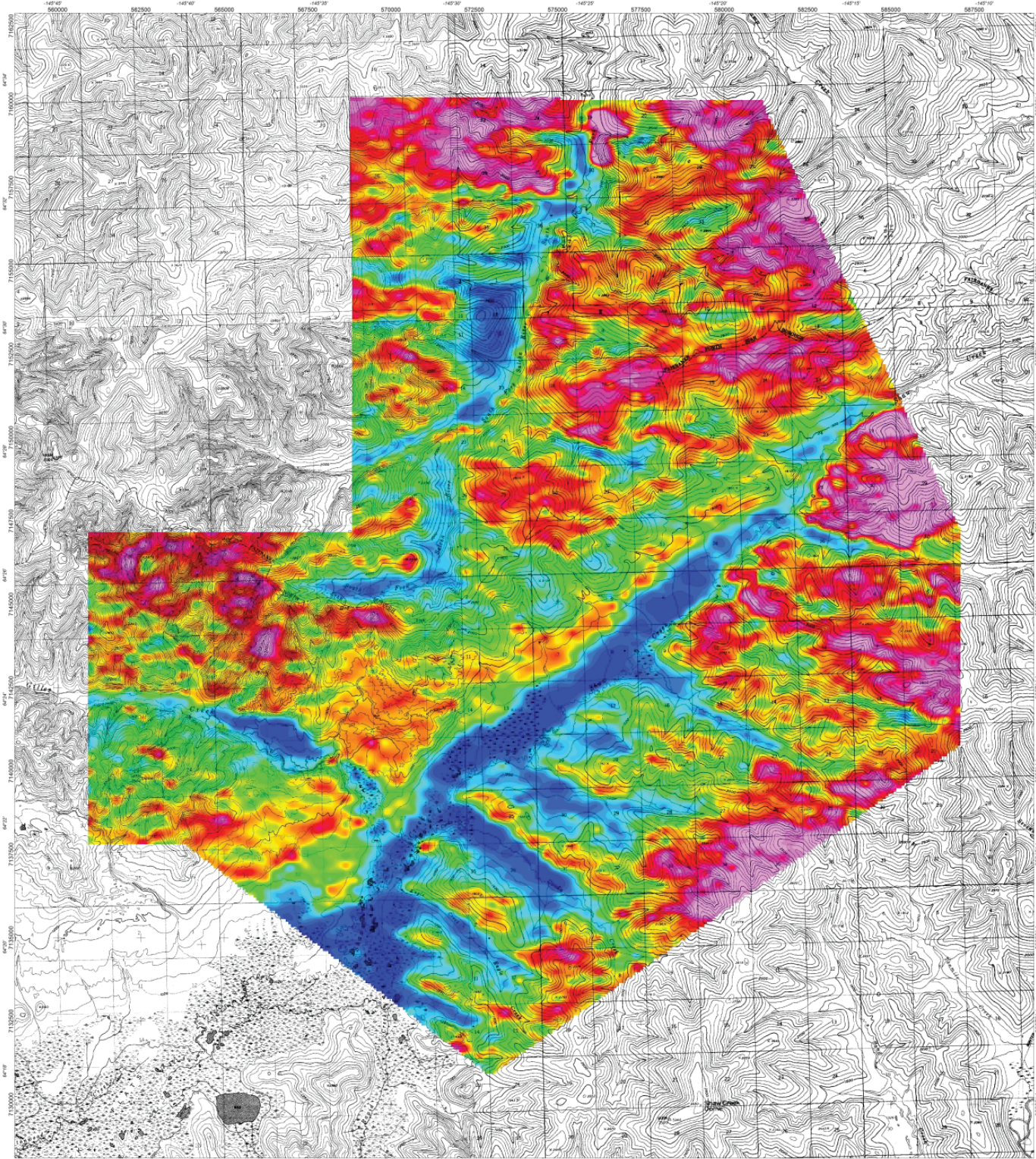
Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Potassium Map (K%)

Shaw Creek Block

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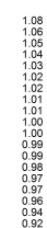
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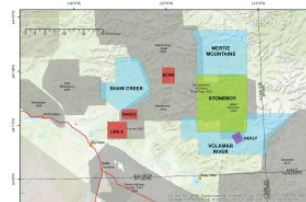
Ratio Potassium / Thorium  
(K% / eqTh ppm)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



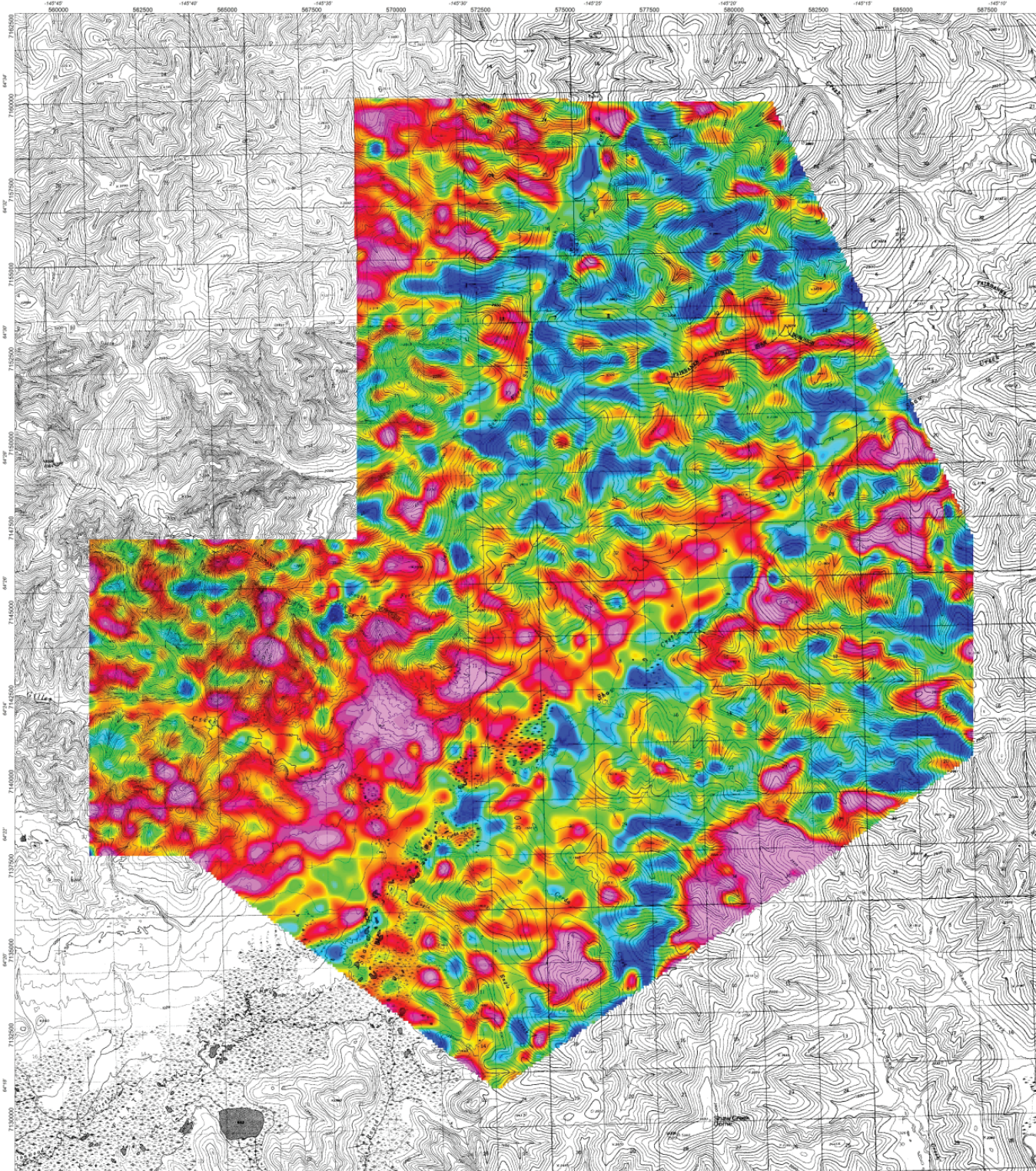
Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Ratio Potassium/Thorium Map (K/eqTh)

Shaw Creek Block

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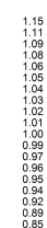
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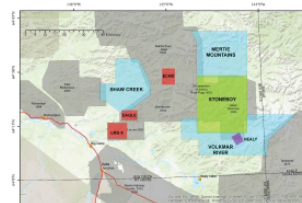
Ratio Uranium / Thorium  
(eqU ppm / eqTh ppm)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



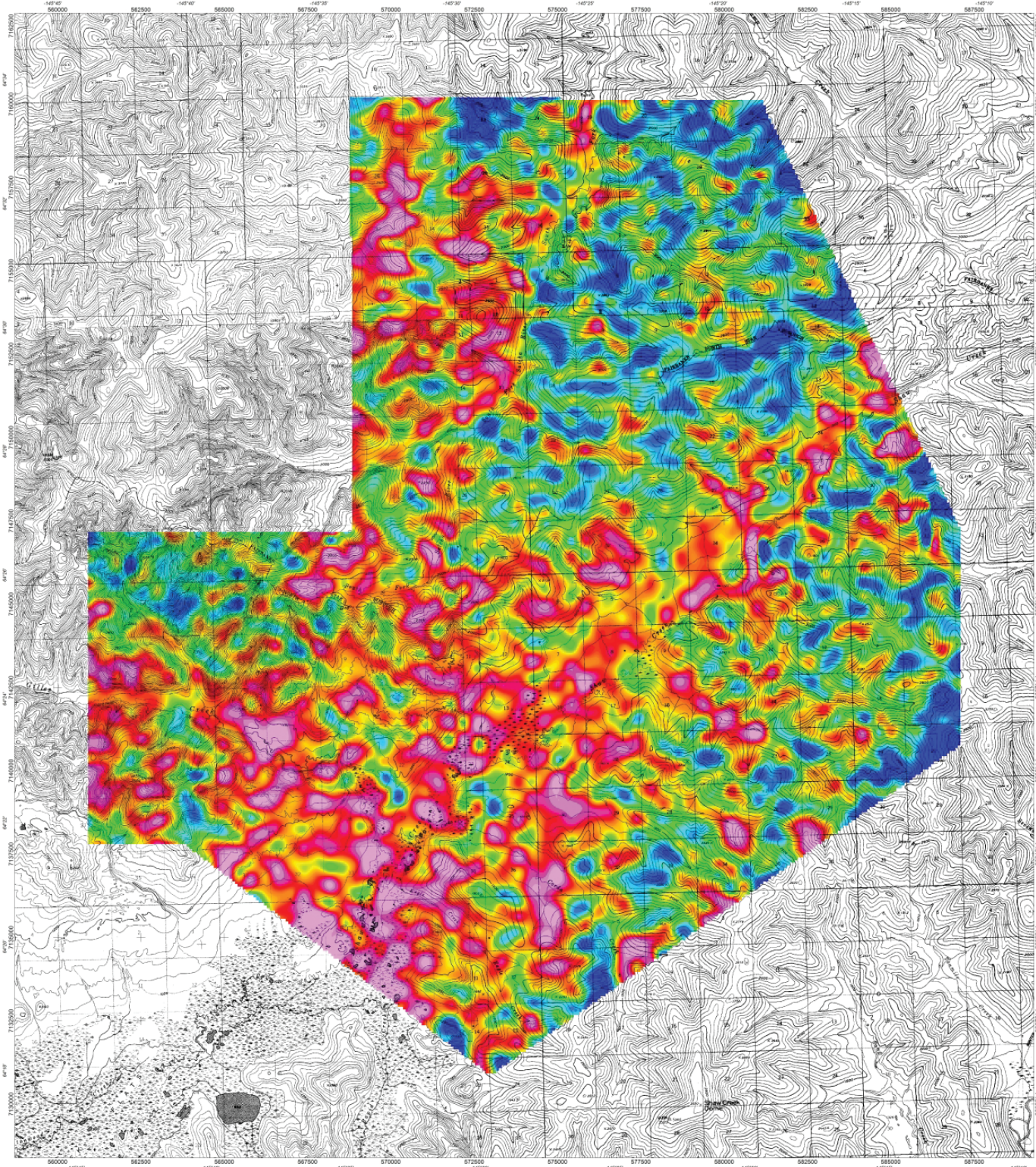
Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
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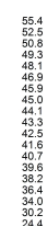
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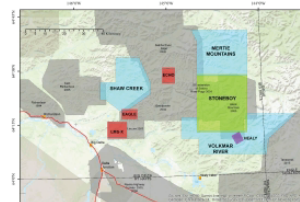
Total Air Absorbed Dose Rate  
(nGy/h)

Contours: USGS Topo Map

Relative regional location of survey areas



Location of all the blocks collected



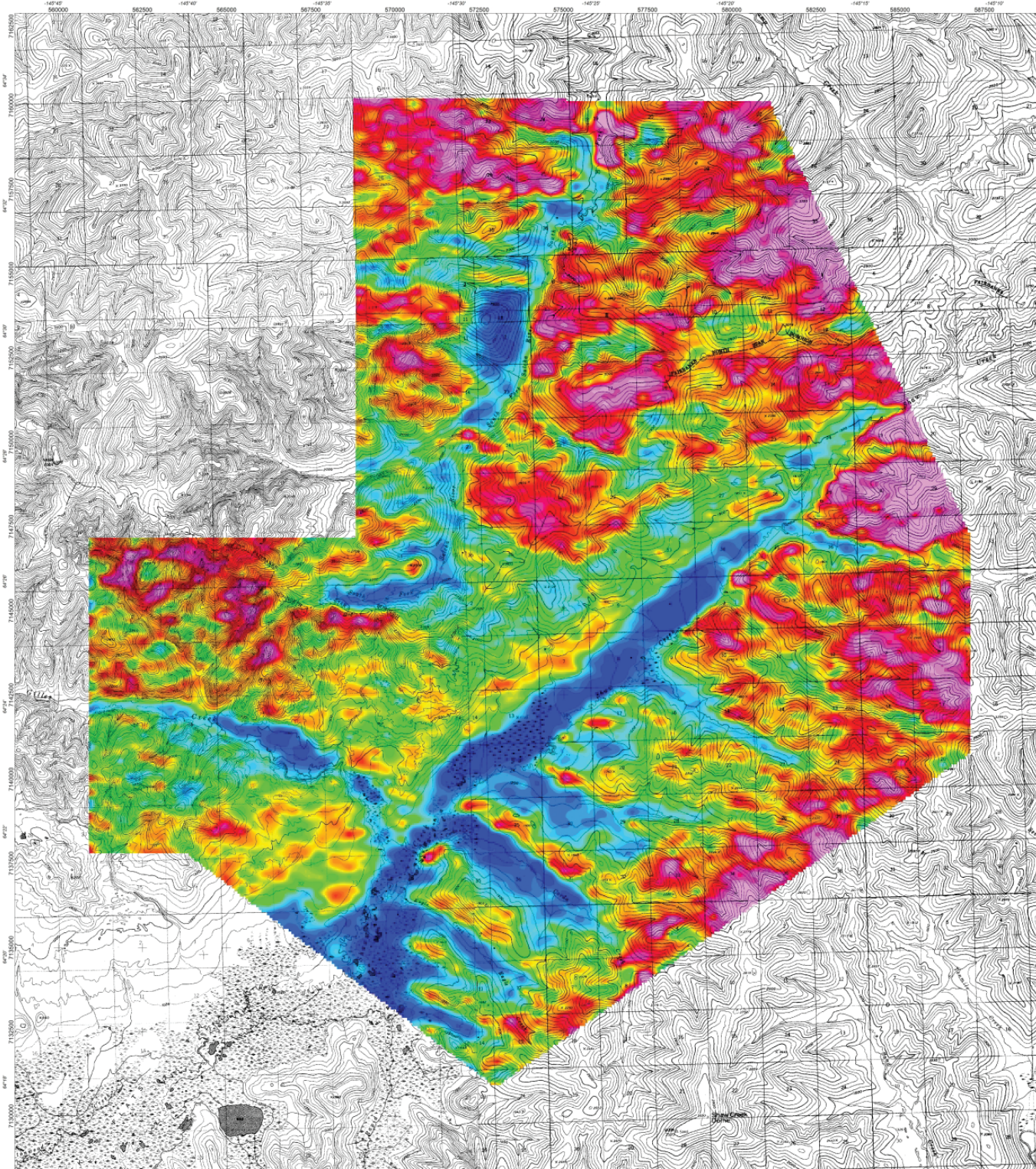
Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Total Air Absorbed Dose  
Rate Map (Taadr)

Shaw Creek Block

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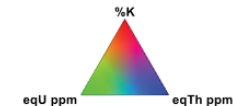
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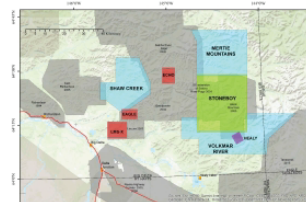


Contours: USGS Topo Map

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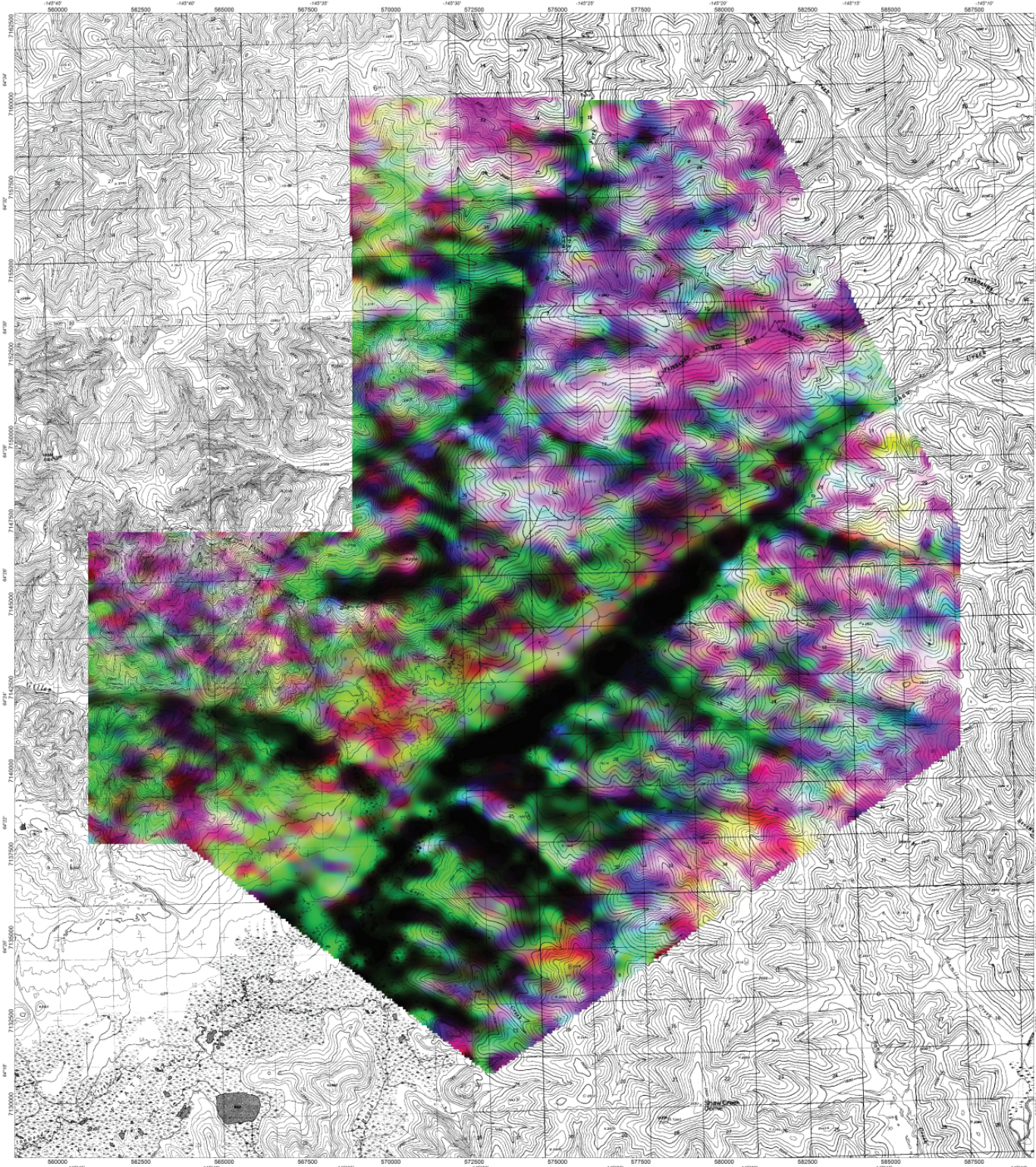
Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Ternary Map (%K - eqU ppm - eqTh ppm)

Shaw Creek Block

Geophysical Report 2020-16



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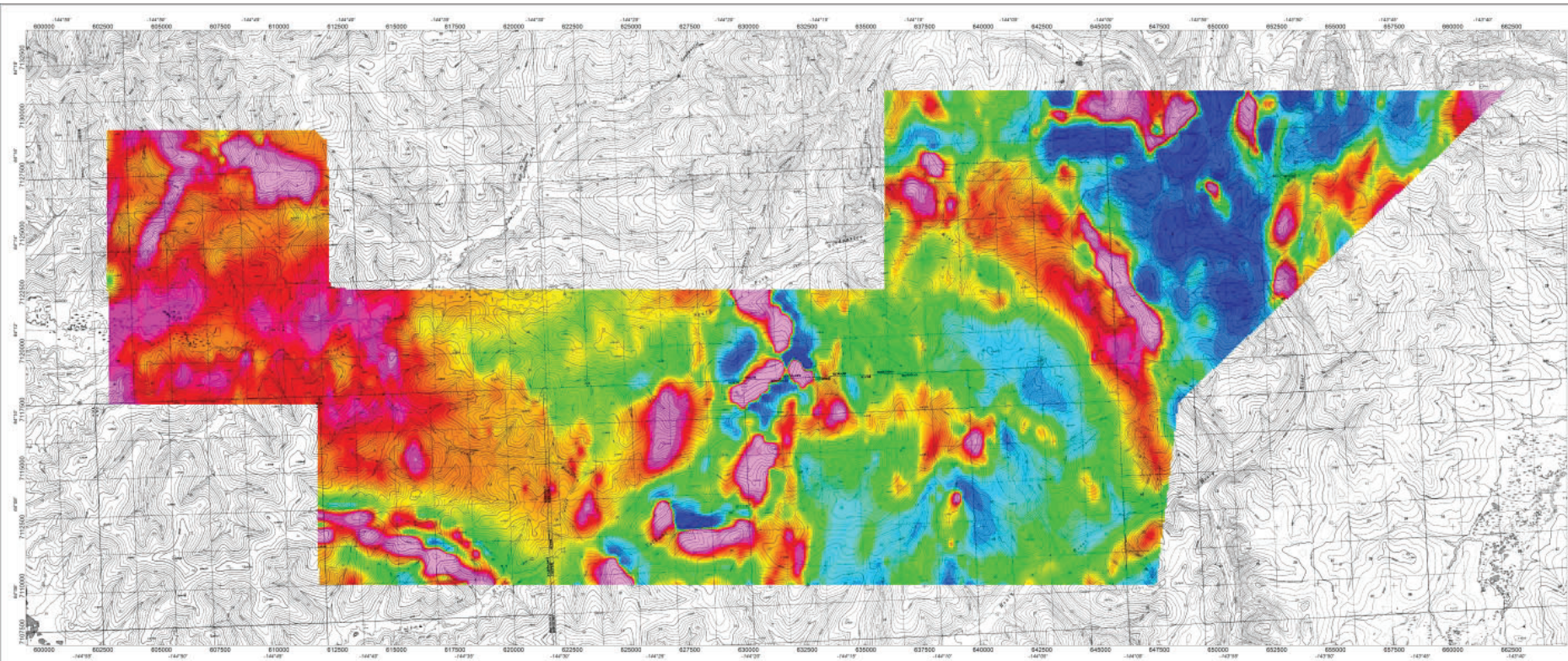
This work was supported by State of Alaska designated general funds as part of DGS' FY2020 operating budget, and by industry partners: Northern Star (Pogo LLC, Millrock Resources Inc., and Northway Resources Corp).  
Timond, A.M. and MPX Geophysics LTD, 2020, Shaw Creek and Shawnee Peak airborne magnetic and radiometric geophysical survey, Alaska Division of Geological & Geophysical Surveys, Geophysical Report 2020-16, 2 p. <http://doi.org/10.14509/30551>

Scale 1:50000  
1000 0 1000 2000 3000  
(meters)  
WGS 84 - UTM zone 6N









<b>LEGEND</b>	July 2020 ADGGS MPX
<b>SURVEY PARAMETERS:</b>	
Map Terrain Clearance:	100 meters
Minimum Sample Interval:	100 meters
Maximum Sample Interval:	100 meters
Traverse Line Direction:	90° (E-W)
Control Line Direction:	0° (N-S)
Traverse Line Spacing:	400 m
Control Line Spacing:	400 m
<b>AIRBORNE MAGNETOMETER SYSTEM:</b>	
Source: CS-3 Magnetometer System and Fluxgate Mag. Bridge	
Configuration:	Single
Sampling Rate:	20 readings/second
Resolution:	0.01 nT
<b>AIRBORNE GAMMA-RAY SPECTROMETER:</b>	
Model: EG&G ORTEC GDS 1112	
Configuration: 2x 4 inch NaI(Tl) crystals	
Sampling Rate:	1 reading/second
<b>AIRBORNE NAVIGATION SYSTEM:</b>	
Hardware: RTX GPS L1/L2	
Sampling Rate:	5 readings/second
Software: Survey Station (SSS)	
<b>LASER ALTIMETER:</b>	
Model: SICK 1510	
Sampling Rate:	10 readings/second
<b>BASIC STATION MAGNETOMETER:</b>	
Model: GDS 1112	
Sampling Rate:	1 reading/second
Resolution:	0.02 nT

Relative regional location of survey areas

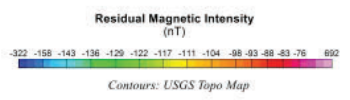


Location of all the blocks collected



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Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Residual Magnetic Intensity Map

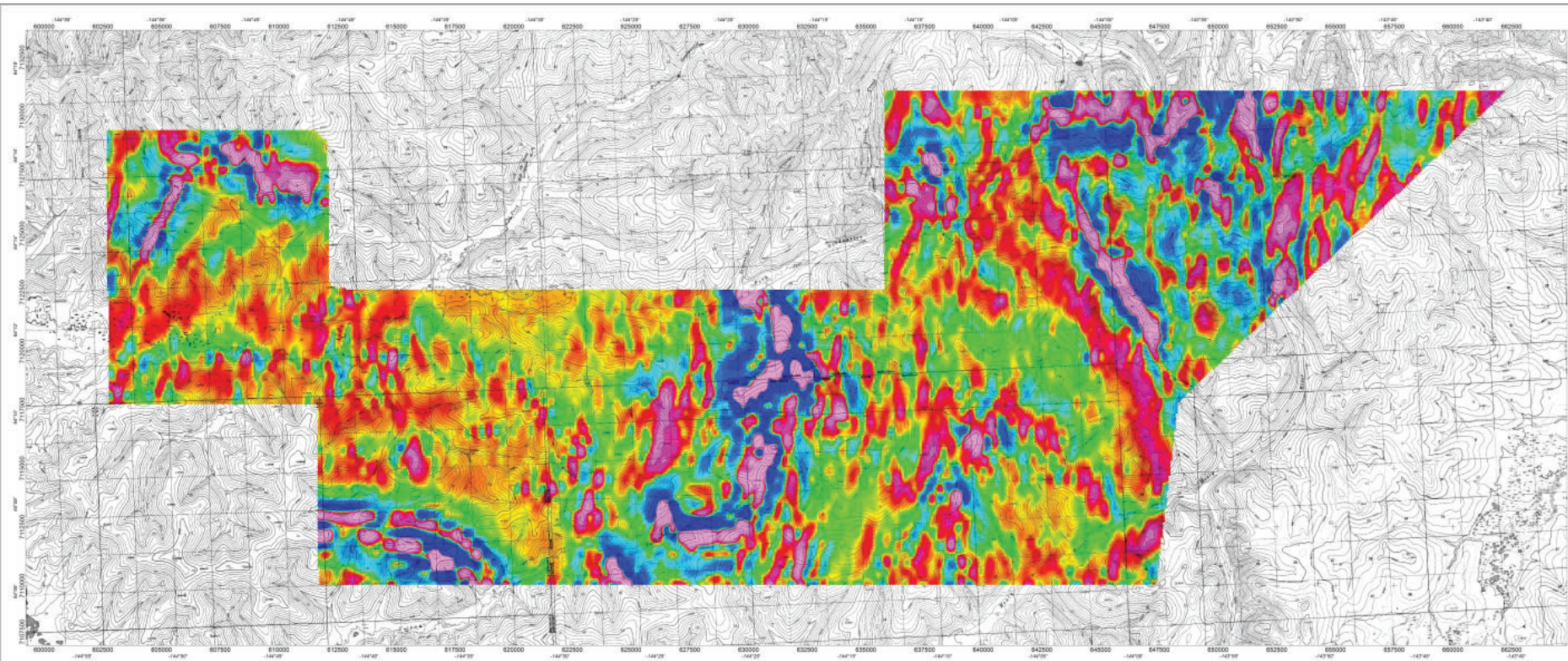
Volkmar River Block

Geophysical Report 2020-16












**LEGEND**

Survey Date: July 2020  
 Mapping Date: August 2020  
 Projection: UTM

**SURVEY PARAMETERS:**

Main Terrain Clearance: 100 meters  
 Aircraft Altitude: 100 meters  
 Magnetometer: Bartington  
 Traverse Line Direction: 90° (E-W)  
 Control Line Direction: 90° (E-W)  
 Traverse Line Spacing: 400 m  
 Control Line Spacing: 400 m

**AIRBORNE MAGNETOMETER SYSTEM:**

Source: CS-3 Magnetometer System and Fluxgate Mag. Bridge  
 Configuration: Bartington  
 Sampling Rate: 1 reading/second

**AIRBORNE GAMMA-RAY SPECTROMETER:**

Model: EG&G ORTEC  
 Sampling Rate: 1 reading/second

**AIRBORNE NAVIGATION SYSTEM:**

Hardware: EG&G GPS L1/L2  
 Sampling Rate: 1 reading/second

**LASER ALTIMETER:**

Model: EG&G L1/L2  
 Sampling Rate: 1 reading/second

**BASE STATION MAGNETOMETER:**

Model: EG&G L1/L2  
 Sampling Rate: 1 reading/second

**Relative regional location of survey areas**

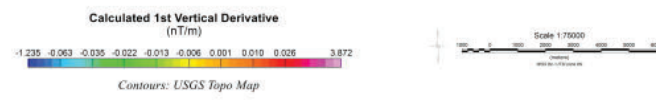


**Location of all the blocks collected**



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**Alaska Division of Geological & Geophysical Surveys**

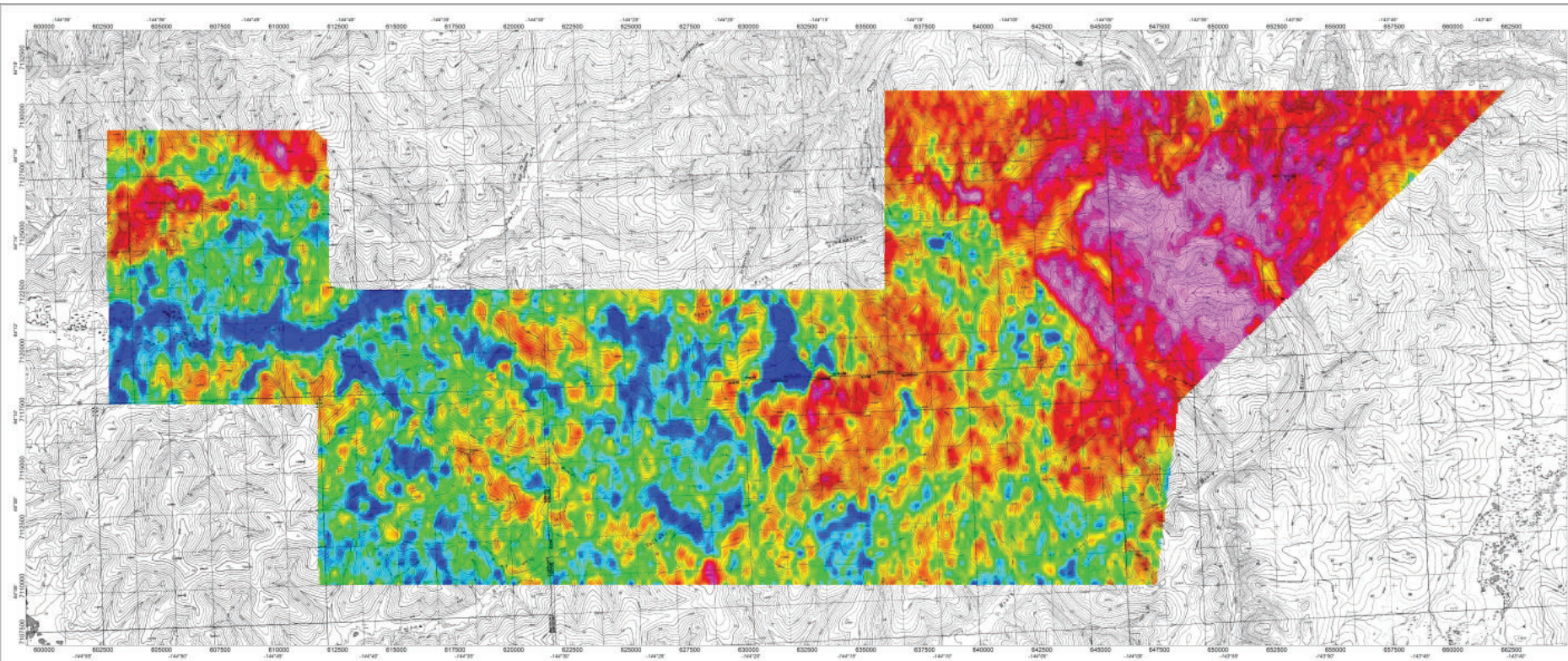
Shaw Creek and Shawnee Peak Airborne  
 Magnetic and Radiometric Geophysical Survey

**Calculated 1st Vertical Derivative Map**

**Volkmar River Block**

Geophysical Report 2020-16








**LEGEND**

Survey Dates: July 2020  
 Airborne Type: A330002  
 Repetition: 1:00000

**SURVEY PARAMETERS:**

Map Terrain Clearance: 100 meters  
 Sensor Altitude: 100 meters  
 Magnetometer: 100 meters  
 Traverse Line Direction: 90° (E-W)  
 Control Line Direction: 0° (N-S)  
 Traverse Line Spacing: 400 m  
 Control Line Spacing: 400 m

**AIRBORNE MAGNETOMETER SYSTEM:**

Source: GE - 3 Magnetometer System  
 and Flights Mag. 3-String  
 Configuration: 3-String  
 Sampling Rate: 1 reading/second  
 Resolution: 0.01 nT

**AIRBORNE GAMMA-RAY SPECTROMETER:**

Model: EG&G ORTEC  
 Sampling Rate: 1 reading/second  
 Resolution: 0.01 nT

**AIRBORNE NAVIGATION SYSTEM:**

Hardware: EG&G GPS L1/L2  
 Sampling Rate: 1 reading/second  
 Resolution: 0.01 nT

**LASER ALTIMETER:**

Model: EG&G L1/L2  
 Sampling Rate: 1 reading/second  
 Resolution: 0.01 nT

**BASIC STATION MAGNETOMETER:**

Model: EG&G L1/L2  
 Sampling Rate: 1 reading/second  
 Resolution: 0.01 nT

**Relative regional location of survey areas**

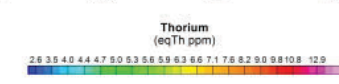


**Location of all the blocks collected**



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Contours: USGS Topo Map



**Alaska Division of Geological & Geophysical Surveys**

Shaw Creek and Shawnee Peak Airborne  
 Magnetic and Radiometric Geophysical Survey

**Thorium Map (eqTh ppm)**

Volkmar River Block

Geophysical Report 2020-16

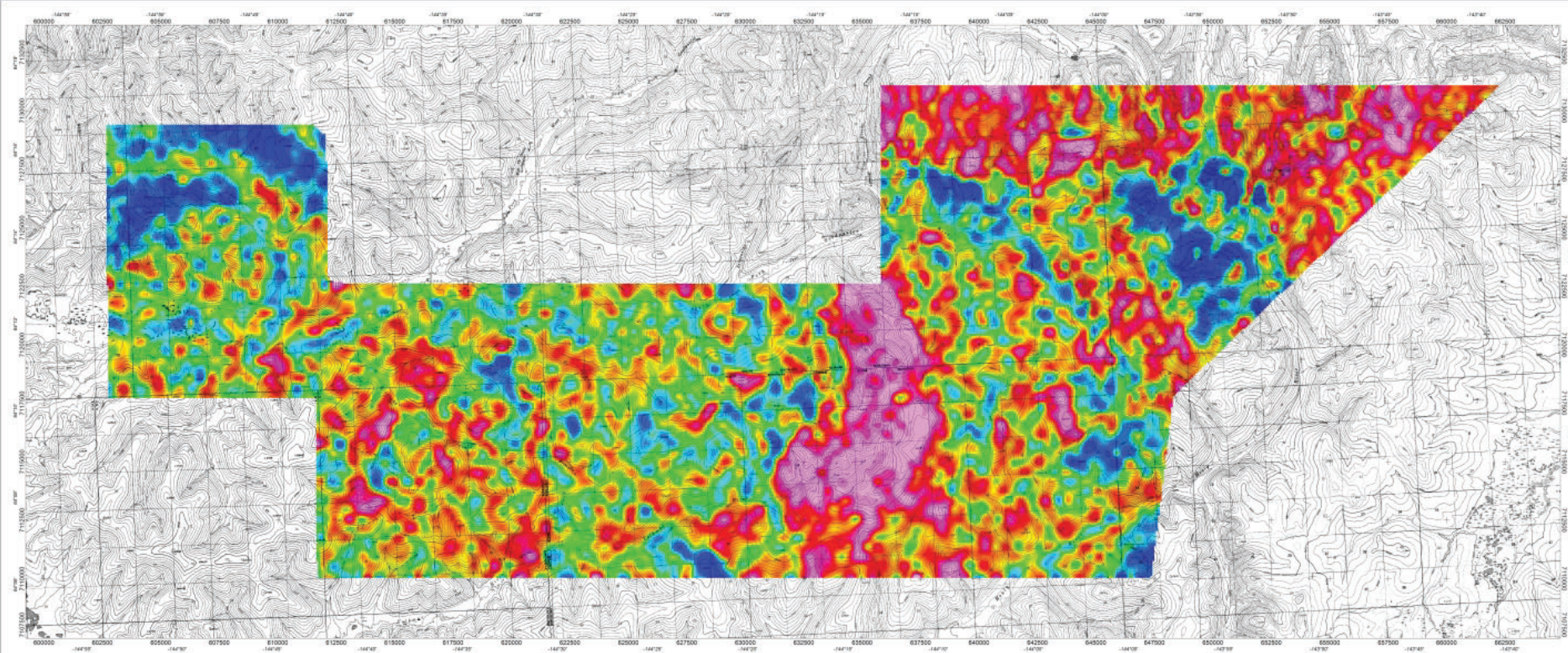










[illegible]

Relative regional location of survey areas



*Location of all the blocks collected*



Alaska Division of Geological &amp; Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

Ratio Potassium/Thorium Map (K/eqTh)

### Volkmar River Block

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Website: <http://dona.alaska.gov>

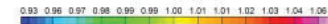
Website: <https://dggg.alaska.gov/>

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Ratio Potassium / Thorium

(K% / eqTh ppm)



Contours: USGS Topo Map



Alaska Division of Geological & Geophysical Surveys

Shaw Creek and Shawnee Peak Airborne  
Magnetic and Radiometric Geophysical Survey

*Ratio Potassium/Thorium Map (K/eqTh)*

*Volkmar River Block*

*Geophysical Report 2020-16*







