GEOPHYSICAL REPORT
GROUND VLF-EM AND MAGNETIC SURVEY

Field Report - Basic data Processing

Bonanza Project (BZA)

YT, Canada

Work Performed On: June. 28 to July 21, 2020

FOR:

White Gold Corp.
82 Richmond Street East
Toronto, ON M5C

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Table of Contents

1.0 Introduction 2

2.0 Purpose and Scope 2

3.0 Survey Description 2

4.0 Survey Theory 4

5.0 Results and recommendations 6

6.0 Deliverables 7

List of Figures

Figure 1: Location map of ground VLF and magnetic survey 2020 on BZA property. 3
Figure 2: EM field distribution for the VLF method in E-polarization. 5
Figure 3: Earth's magnetic field, declination (D) and inclination angles 6
Figure 4: Fraser filter of in-phase signal frequency 16.4 kHz JXN, NWY. 11
Figure 5: Fraser filter of out-of-phase signal frequency 16.4 kHz JXN, NWY. 12
Figure 6: Fraser filter of in-phase signal frequency 24.8 kHz NLK, WA, USA. 13
Figure 7: Fraser filter of out-of-phase signal frequency 24.8 kHz NLK, WA, USA. 14
Figure 8: Fraser filter of in-phase signal frequency 25.2 kHz NML, ND, USA. 15
Figure 9: Fraser filter of out-of-phase signal frequency 25.2 kHz NML, ND, USA. 16
Figure 10: Total Magnetic Intensity RTP from ground magnetic survey 2020. 17
Figure 11: First Vertical Derivative of RTP from ground magnetic survey 2020. 18
Figure 12: Tilt Derivative of RTP from ground magnetic survey 2020. 19

List of Tables

Table 1: The parameters of VLF Tx stations. 3
Table 2: VLF-EM frequencies collected per each line. 8
Table 3: Database channels of ground VLF and mag survey 2020. 10

1.0 Introduction

This report describes data acquisition and preliminary data processing results of the 2020 ground VLF-EM and magnetic survey. GroundTruth Exploration was commissioned by White Gold Corp, Toronto, ON to plan the survey and process the data.

Between June 28 to July 21, 2020, ground VLF-EM and magnetic surveys were completed over the Bonanza claims (BZA) exploration targets located in the Yukon Territory. This survey is a part of a comprehensive survey completed in order to target future exploration on the property.

2.0 Purpose and Scope

The primary purpose of completing ground VLF and magnetic geophysical surveys is to determine the spatial distribution of subsurface electrical and magnetic properties of rocks. This, in turn, will allow the characterization of geophysical signatures for zones of mineralization and support geological models and structural mapping.

3.0 Survey Description

Data were acquired using GEM-19 portable VLF systems supplemented by a high-sensitivity Overhauser magnetometer. The Overhauser magnetometers have the advantages of low power consumption (lighter or longer lifetime battery), faster sampling as the electron-proton coupling can happen even as measurements are being taken. The magnetometer has an absolute accuracy of about +/- 0.01nT. Along with basic GPS tracking, GEM provides a navigation feature with the real-time coordinate transformation to UTM and the local grid. Operators can define a complete survey on PC and download points to the magnetometer via RS-232 serial port.

During the survey, a GEM-19 magnetometer was set up as the base station to collect data for correction and removing of unwanted noise arising from solar and atmospheric activity.

Total coverage of the survey block amounted to 158.7 line-km tacking 15310 readings at about 10m station spacing. The survey lines are in an azimuthal direction of E-W (NE 90°) with a line spacing of 100m. The in-phase and out-of-phase (quadrature) signals were measured as percentage of total field for three frequencies.

The VLF transmitter frequencies used for this survey are presented in Table 1. The outline of survey areas and layout of survey lines are shown in Figure-1.

Table 1: The parameters of VLF Tx stations.

VLF Tx Station	Frequency (kHz)	Distance (km)	Latitude	Longitude	Azimuth of signal
NML, ND	25.2	~ 3,100	46.365987°N	98.335667°W	~ N 343°
NSS, MD	21.4	~4,900	38.977778°N	76.453333°W	~ N 270°
NLK, WA	24.8	~ 2,000	48.203633°N	121.916828°W	~ N 310°
JXN, NWY	16.4	~ 5,400	66.982337°N	13.872471°E	~ N 193°
Tx27	18.6	Portable	-	-	-

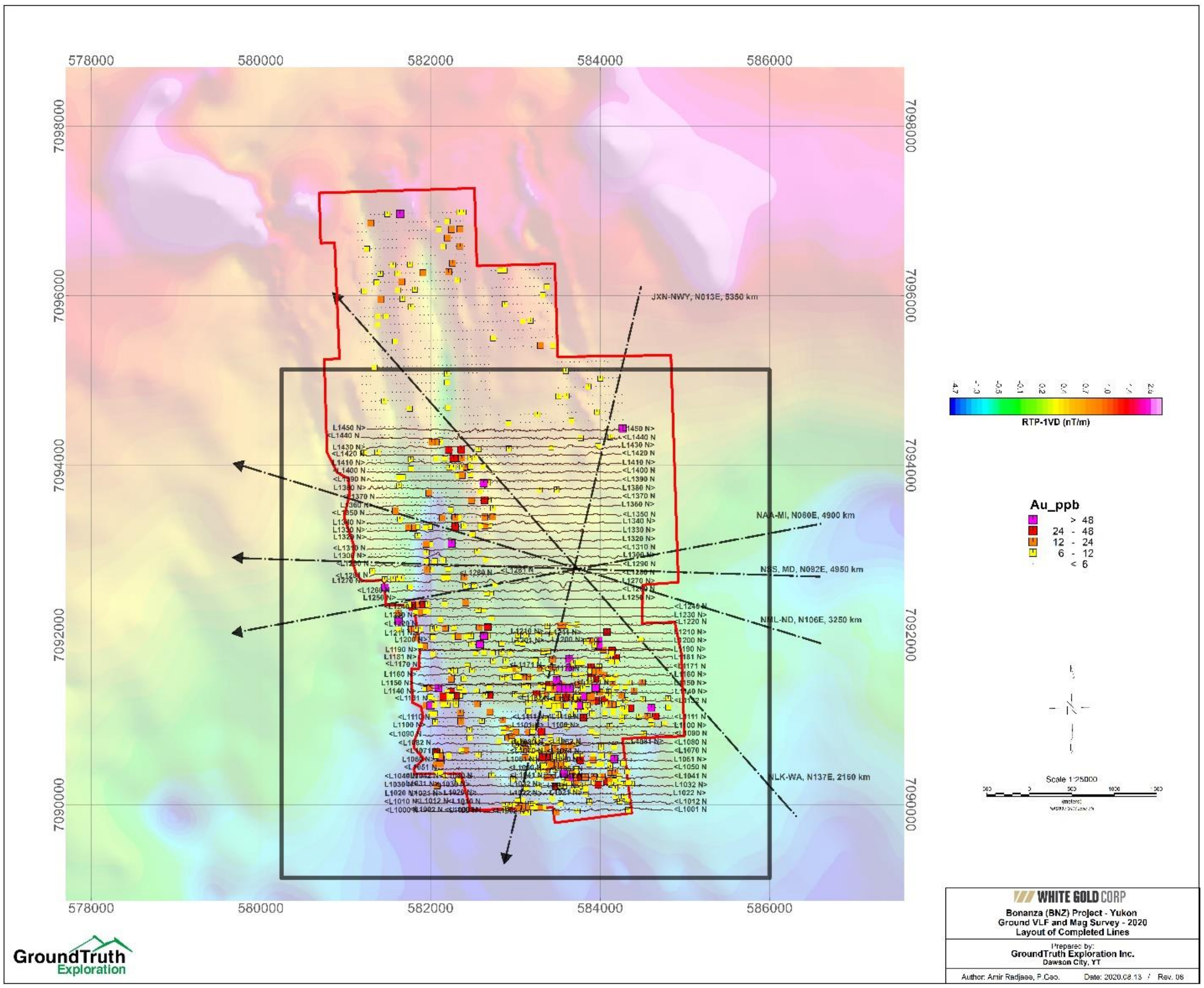


Figure 1: Location map of ground VLF and magnetic survey 2020 on BZA property, YT.

4.0 Survey Theory

4.1 Very Low Frequency (VLF) survey

Very Low Frequency Electromagnetics (VLF) is a geophysical ground probing technology that uses powerful remote radio transmitters set up in different parts of the world for the military submarine communication. In radio communications terminology, VLF means very low frequency, about 15 to 25 kHz, while relative to frequencies generally used in geophysical exploration, these are very high frequencies. The radiated field from a remote VLF transmitter, propagating over a uniform or horizontally layered earth and measured on the earth's surface, consists of a vertical electric field component and a horizontal magnetic field component each perpendicular to the direction of propagation.

These radio transmitters are very powerful and induce electric currents in conductive bodies thousands of kilometres away. Under normal conditions, the fields produced are relatively uniform in the far-field at a significant distance (hundreds of kilometres) from the transmitters. The induced currents produce secondary magnetic fields that can be detected at the surface through the deviation of the normal radiated field (Figure 2).

VLF is used in many applications, including mineral exploration, water exploration and more. In mineral exploration, VLF data are used to map geologic structure, including the apparent dip of the fault and shear zones. The data can be interpreted to identify the dip of these structures for reliable drilling. Data are also used to identify conductive ground which might correspond to sulphide or clay rich concentrations. A third application is to map overburden in preparation for drilling and further sampling. All of these features have electrical contrasts with surrounding rocks, tending to be more electrically conductive or resistive and are reasonable targets.

The depth of investigation is controlled by the electrical “Skin-Depth” of the local geology. It varies from shallow to in some cases >100m depending upon the overall background resistivity of the subsurface. Typically, 20-75 meters can be expected. Conductive overburden suppresses signals, and depth penetration may be severely limited at times. VLF works best where rocks are resistive and overburden is minimal or is highly resistive.

The data include in-phase and out-of-phase signals as a percentage of the total field, horizontal component (x), horizontal component (y), and field strength in pT. The electrical conductivity of rocks can be modelled by the inversion of VLF data.

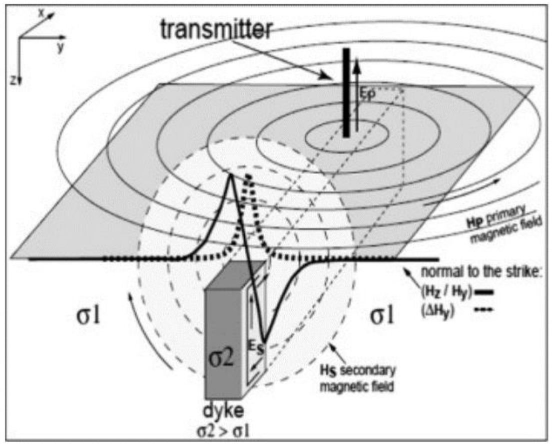


Figure 2: EM field distribution for the VLF method in E-polarization with theoretical signals over a vertical conductive dike (after Bosch and Müller, 2001).

4.2 Magnetic surveys

Magnetics is the most commonly used geophysical method for gold, diamond, platinum group metals and base metal exploration. Measurements of the magnetic field contain information about subsurface variations in magnetic susceptibility. Data can be acquired in the air (planes, satellites), on the ground (stationary, moving platforms, marine) and underground (boreholes, tunnels). The measurements record the sum of Earth's field and fields induced in magnetic materials. More magnetic (i.e. susceptible) materials have stronger induced fields. Removing Earth's field from the observations yields anomalous fields that can be interpreted in terms of where magnetic material lies and also its susceptibility and shape. Processed data are presented as maps or profiles, and advanced processing, involving inversion, yields parametric structures or 3D models of the subsurface susceptibility distribution.

Magnetic surveying is extremely versatile and can be applied in many areas in the geosciences including geologic mapping and mineral exploration. In gold exploration, magnetics helps in direct detection of associated mineralization and for mapping large- and local-scale structure (faults, dikes, and shear zones).

To a first approximation, the Earth's magnetic field resembles a large dipolar source with a negative pole in the northern hemisphere and a positive pole in the southern hemisphere. The dipole is offset from the center of the earth and is also tilted. The north magnetic pole at the surface of the earth is approximately at Melville Island, Nunavut. The field at any location on the Earth is generally described in terms described of magnitude $|B|$, declination D and inclination I as illustrated in Figure 3.

When the magnetic source field is applied to earth materials it causes the material to become magnetized. Magnetization is dipole moment per unit volume. This is a vector quantity because a dipole has a strength and a direction. Because Earth's field is different at different locations on the earth, then the same object gets magnetized differently depending on where it is situated. As a consequence, magnetic data from a steel drum buried at the north pole will be very different from that from a drum buried at the equator.

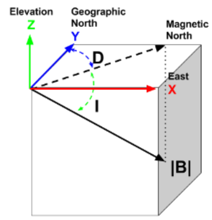


Figure 3: Earth's magnetic field, declination (D) and inclination angles (2018, GeoSci Developers).

5.0 Results and recommendations

For VLF-EM, the Fraser filter of in-phase and out-of-phase signals for frequencies 16.4, 24.8 and 25.2 kHz are presented in Figures 4 through 9. The total magnetic intensity map and derivatives are presented in Figures10-12. The VLF-EM lines are listed in order of measured frequencies in Table-2.

The data can be processed in advanced levels using 2D inversion software for VLF data to create a resistivity model, and using 3D inversion codes for mag data to create susceptibility model for detail analysis and visualization. This will ensure that 3D geological models respect a consistent structural, stratigraphic, and topological framework in addition to ensuring consistency between different geophysical models.

The combination of geophysical models and geological information allows some general correlations to be made. Predominantly, geophysical signatures of prospective deposits for magnetic can be characterized as short-wavelength magnetic anomalies over volcanic terranes because of variable magnetizations and polarizations. This pattern may contrast with an area of moderate to intense alteration that will display a longer-wavelength low, often linear in the case of vein systems, caused by the destruction of magnetite. Local magnetic highs may be associated with intrusions. Magnetic lows will be associated with alteration, however, discriminating such lows from the background and host rock lithology may be difficult on a deposit scale.

Regional resistivity is generally low for weathered, fractured and altered rocks as compared to high resistivity typical of buried intrusions. However, there may be geologic structures and petrologic complications that distort this ideal picture.

The lineament interpretations of VLF and magnetic results can better identify lithological and structures features, as well as fracture zones.

Advanced inversion modeling and interpretation of VLF and magnetic data is recommended for detailed, and property scale exploration targeting work. A study of regional magnetic grids is recommended.

6.0 Deliverables

Report in pdf format

Ground VLF-EM and magnetic survey 2020; Field Report - Basic data Processing; Bonanza Project (BZA), YT; August 2020

Database in Geosoft .dbf and .xyz formats

BZA_GVLF_raw.gdb
BZA_Gmag20_raw.gdb
BZA_GVLF_raw.xyz
BZA_Gmag20_raw.xyz

Geosoft grids in .grd and tiff format

BZA_Gmag20_RTP_prem_lvl.grd	Residual Magnetic Intensity - RTP
BZA_Gmag20_RTP_prem_lvl _1VD.grd	1st Vertical Derivative of RTP
BZA_Gmag20_RTP_prem_lvl _TDR.grd	Tilt Derivative of RTP
bza_IP164c.grd	In-phase response freq. 16.4 kHz, NWY
bza_IP1248c.grd	In-phase response freq. 24.8 kHz, WA
bza_IP252c.grd	In-phase response freq. 25.2 kHz, ND

Maps in .jpg format

BZA_GVLF20_TMI.jpg
BZA_GVLF20_TMI_1VD.jpg
BZA_GVLF20_TMI_TDR.jpg
BZA_GVLF20_FraserIP164_NWY_JXN.jpg
BZA_GVLF20_FraserOP164_NWY_JXN.jpg
BZA_GVLF20_FraserIP248_WA_NLK.jpg
BZA_GVLF20_FraserOP248_WA_NLK.jpg
BZA_GVLF20_FraserIP252_ND_NML.jpg
BZA_GVLF20_FraserOP252_ND_NML.jpg
BZA_GVLF20_Location.jpg

Shapefile

BZA_GVLF20_Lines

Table 2: VLF-EM frequencies collected per each line.

Line	1st freq.		2nd freq.		3rd freq.	
	(kHz)	Station	(kHz)	Station	(kHz)	Station
1001	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1002	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1003	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1011	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1012	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1013	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1021	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1022	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1023	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1031	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1032	16.4	JXN, NWY	18.6	Geonics Tx27	24.8	NLK, WA
1033	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1041	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1042	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1043	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1051	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1052	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1061	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1062	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1071	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1072	16.4	JXN, NWY	18.6	Geonics Tx27	24.8	NLK, WA
1081	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1082	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1090	16.4	JXN, NWY	18.6	Geonics Tx27	24.8	NLK, WA
1101	16.4	JXN, NWY	18.6	Geonics Tx27	24.8	NLK, WA
1102	16.4	JXN, NWY	18.6	Geonics Tx27	24.8	NLK, WA
1111	16.4	JXN, NWY	18.6	Geonics Tx27	24.8	NLK, WA
1112	16.4	JXN, NWY	18.6	Geonics Tx27	24.8	NLK, WA
1120	16.4	JXN, NWY	18.6	Geonics Tx27	24.8	NLK, WA
1130	16.4	JXN, NWY	18.6	Geonics Tx27	24.8	NLK, WA
1140	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1150	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1160	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1171	16.4	JXN, NWY	24.8	NLK, WA	21.4	NSS, MD
1172	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1180	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1190	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1201	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND

1202	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1203	16.4	JXN, NWY	24.8	NLK, WA	21.4	NSS, MD
1211	16.4	JXN, NWY	24.8	NLK, WA	21.4	NSS, MD
1212	16.4	JXN, NWY	24.8	NLK, WA	21.4	NSS, MD
1213	16.4	JXN, NWY	24.8	NLK, WA	21.4	NSS, MD
1220	16.4	JXN, NWY	24.8	NLK, WA	21.4	NSS, MD
1230	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1240	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1250	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1260	16.4	JXN, NWY	24.8	NLK, WA	21.4	NSS, MD
1270	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1281	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1282	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1290	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1300	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1311	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1312	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1320	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1330	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1340	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1350	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1360	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1370	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1380	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1390	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1400	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1411	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1412	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1420	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1430	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1441	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1442	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND
1450	16.4	JXN, NWY	24.8	NLK, WA	25.2	NML, ND

Table 3: Database channels of ground VLF and mag survey 2020.

Channel name	Description	category
basemag	Diurnal (cleaned up, final)	mag
mag0	magraw despiked	mag
mag1	mag0 interpolated despiked & NLF	mag
mag2	mag1 after diurnal correction	mag
magraw	raw mag	mag
east	best easting	nav
GPS_Z	GPS Z coordinate from GEM	nav
Lat	Latitude - GEM (raw)	nav
lat1	Latitude - GEM despiked	nav
Lon	Longitude - GEM (raw)	nav
lon1	Longitude GEM despiked	nav
Ltime	Local time (HHMMSS)	nav
north	best northing	nav
sat	amount of satellites (GEM gps)	nav
Slope	slope (raw)	nav
sq	signal quality	nav
X	UTM X from GEM gps	nav
Y	UTM Y from GEM gps	nav
IP_164	VLF In-Phase, 16.4 kHz (Raw)	vlf
IP_186	VLF In-Phase, 18.6 kHz (Raw)	vlf
IP_248	VLF In-Phase, 24.8 kHz (Raw)	vlf
IP_252	VLF In-Phase, 25.2 kHz (Raw)	vlf
khz_164	VLF - freq 16.4 (confirmation /test channel)	vlf
khz_186	VLF - freq 18.6 (confirmation /test channel)	vlf
khz_248	VLF - freq 24.8 (confirmation /test channel)	vlf
khz_252	VLF - freq 25.2 (confirmation /test channel)	vlf
oP_164	out of phase /quad 16.4	vlf
oP_186	out of phase /quad 16.4	vlf
oP_248	out of phase /quad 16.4	vlf
oP_252	out of phase /quad 16.4	vlf
pT_164	signal strength VLF- 16.4 kHz	vlf
pT_186	signal strength VLF-18.6 khz	vlf
pT_248	signal strength VLF- 14.8 khz	vlf
pT_252	signal strength VLF-25.2 khz	vlf

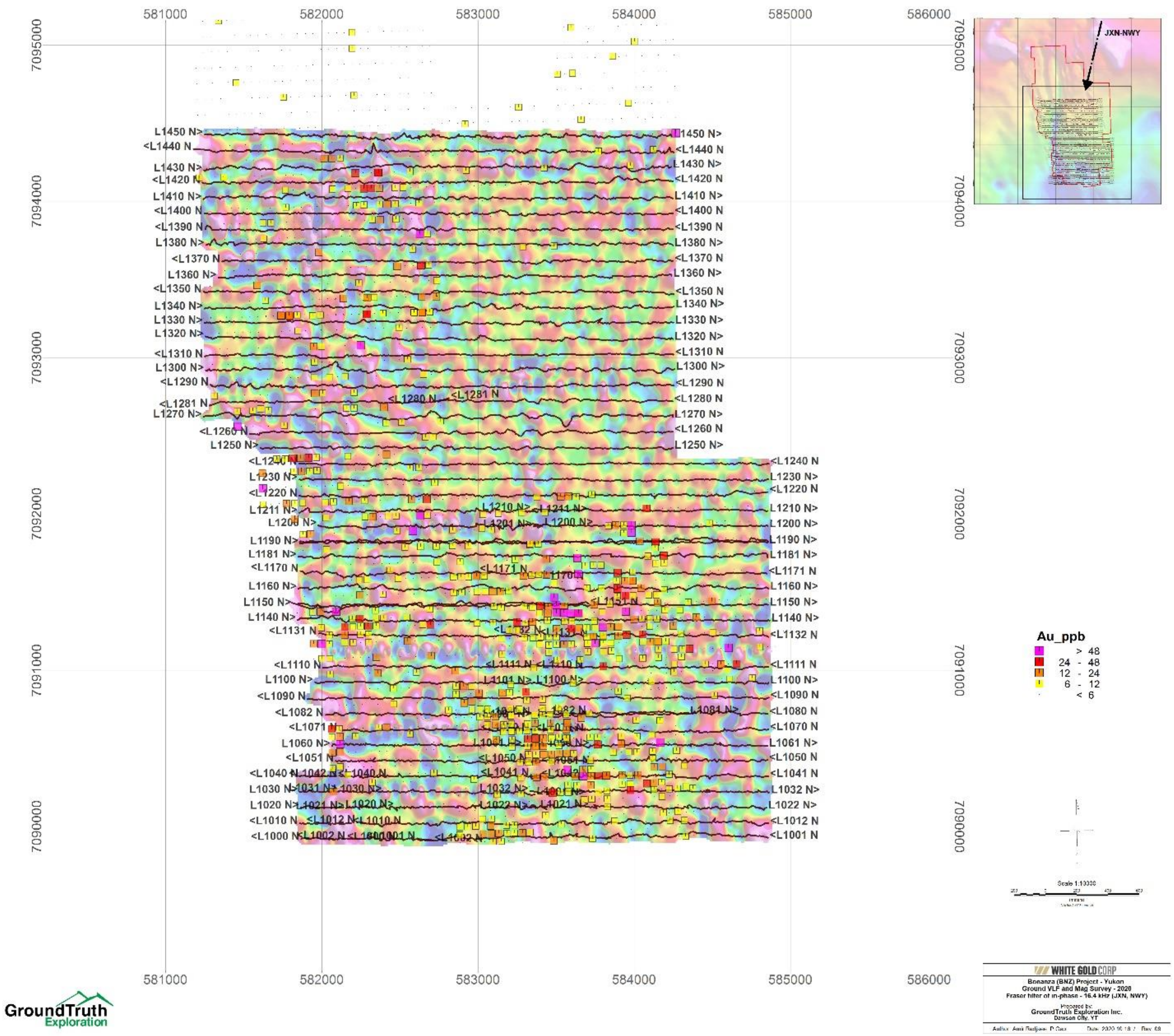


Figure 4: Ground VLF-EM survey 2020, Fraser filter of in-phase signal frequency 16.4 kHz JXN, NWY.

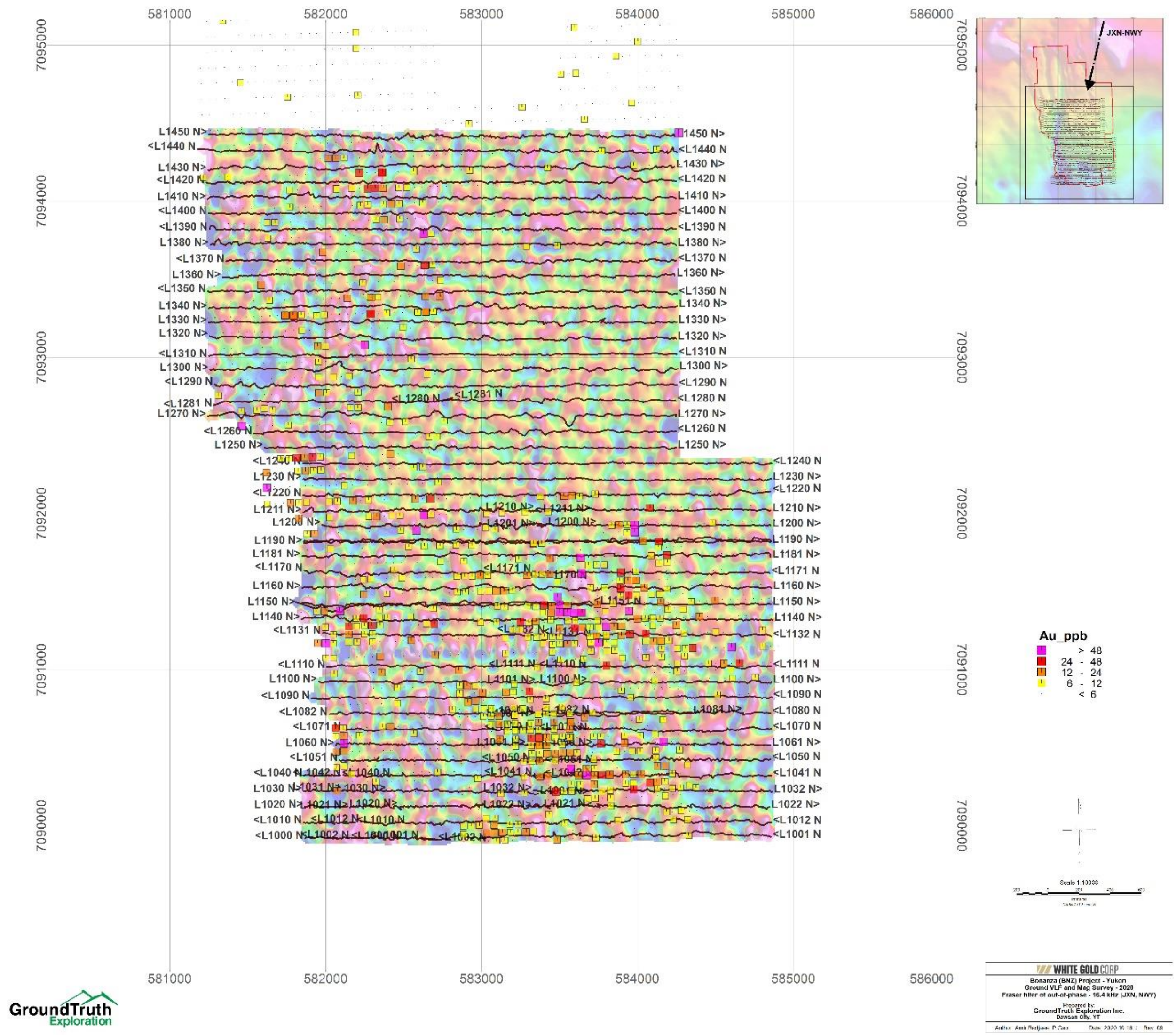


Figure 5: Ground VLF-EM survey 2020, Fraser filter of out-of-phase signal frequency 16.4 kHz JXN, NWY.

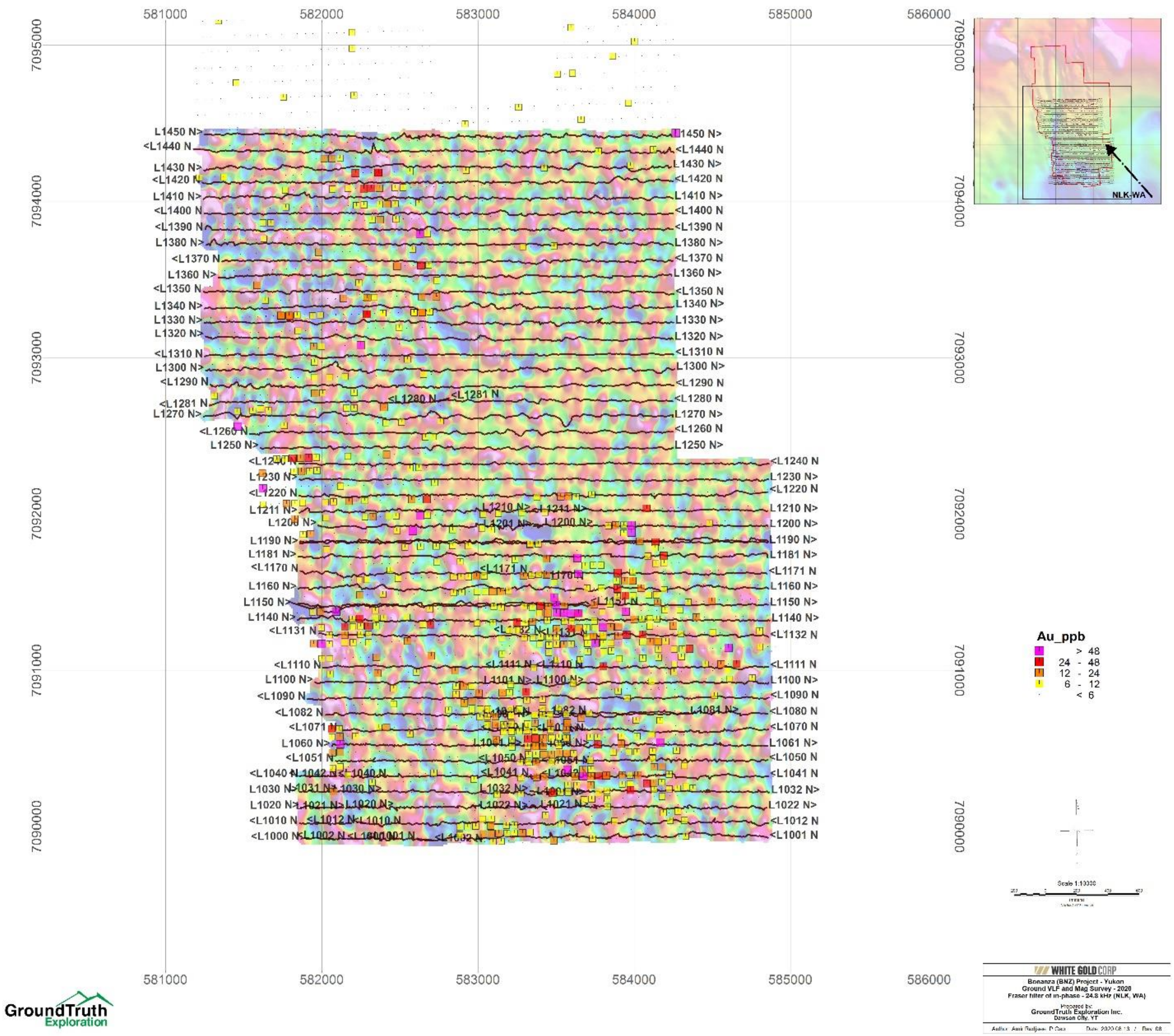


Figure 6: Ground VLF-EM survey 2020, Fraser filter of in-phase signal frequency 24.8 kHz NLK, WA, USA.

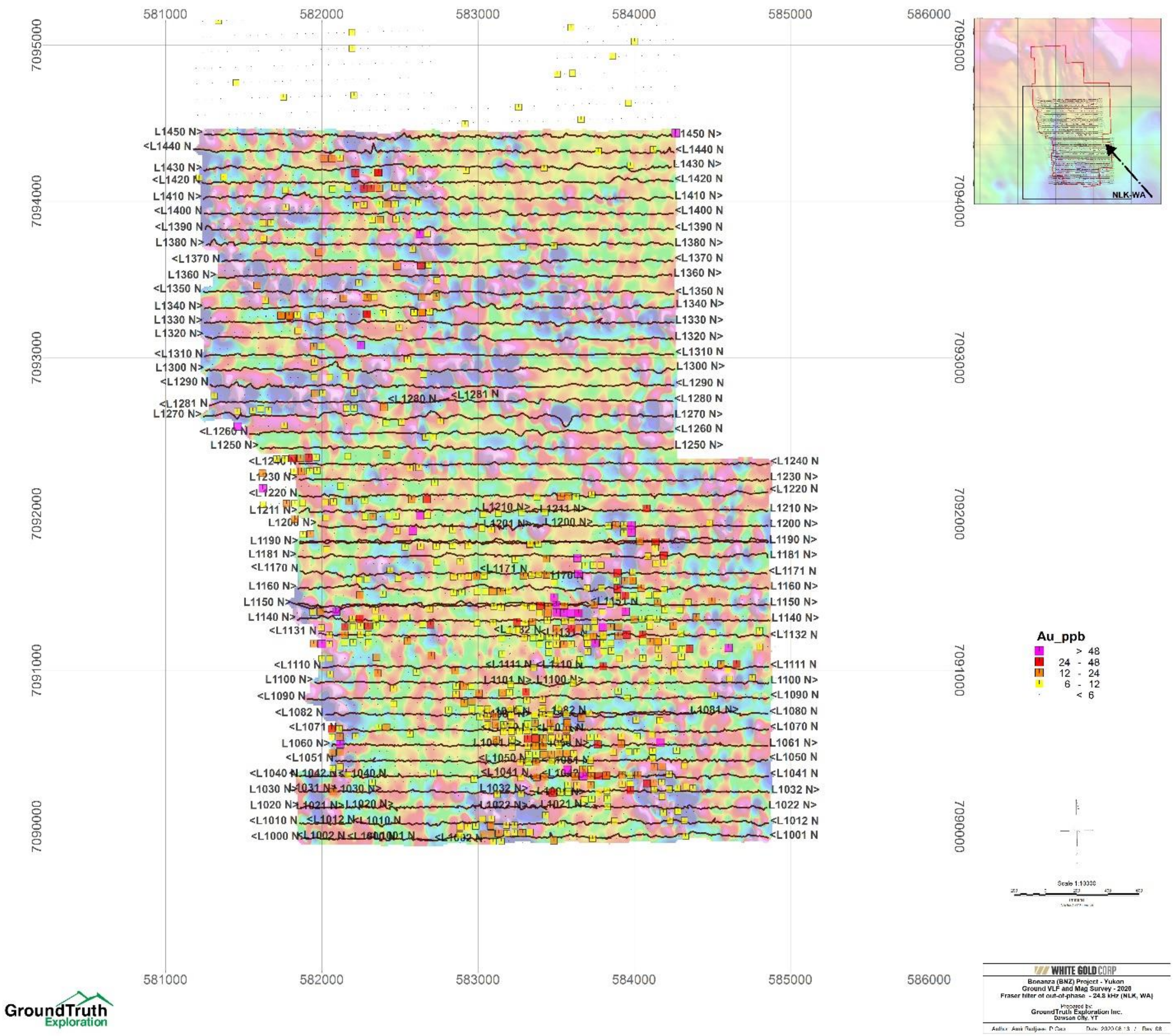


Figure 7: Ground VLF-EM survey 2020, Fraser filter of out-of-phase signal frequency 24.8 kHz NLK, WA, USA.

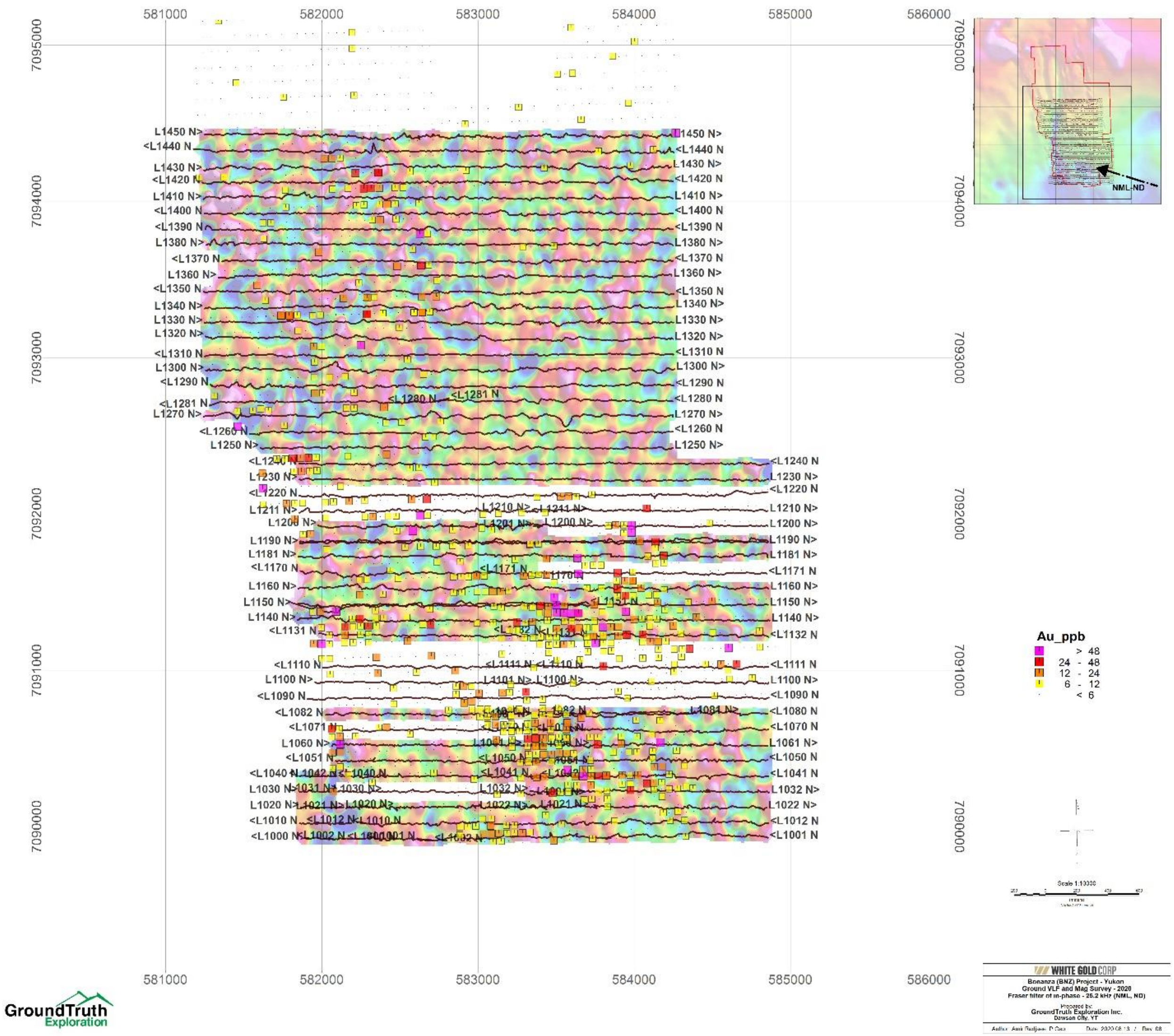


Figure 8: Ground VLF-EM survey 2020, Fraser filter of in-phase signal frequency 25.2 kHz NML, ND, USA.

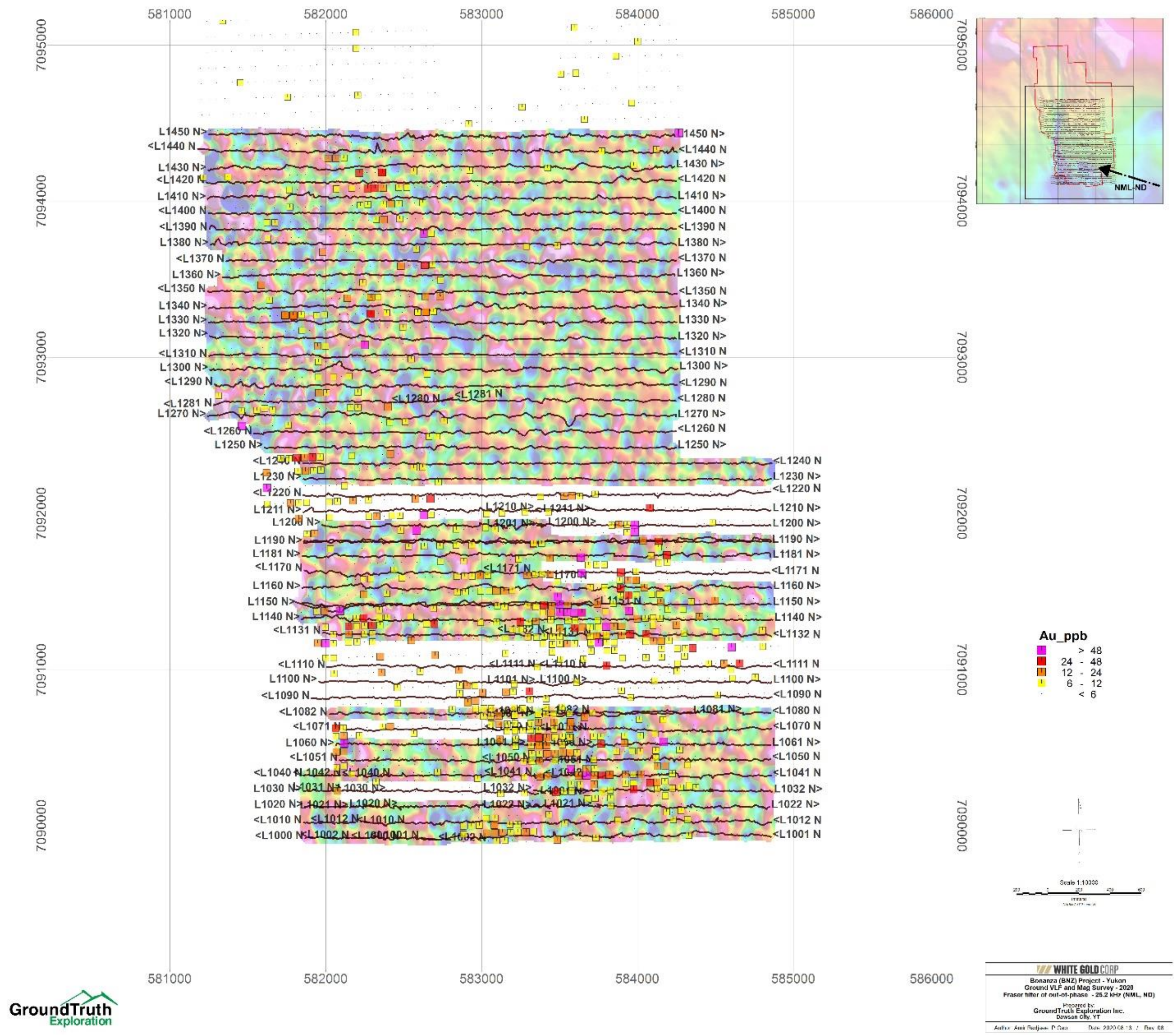


Figure 9: Ground VLF-EM survey 2020, Fraser filter of out-of-phase signal frequency 25.2 kHz NML, ND, USA.

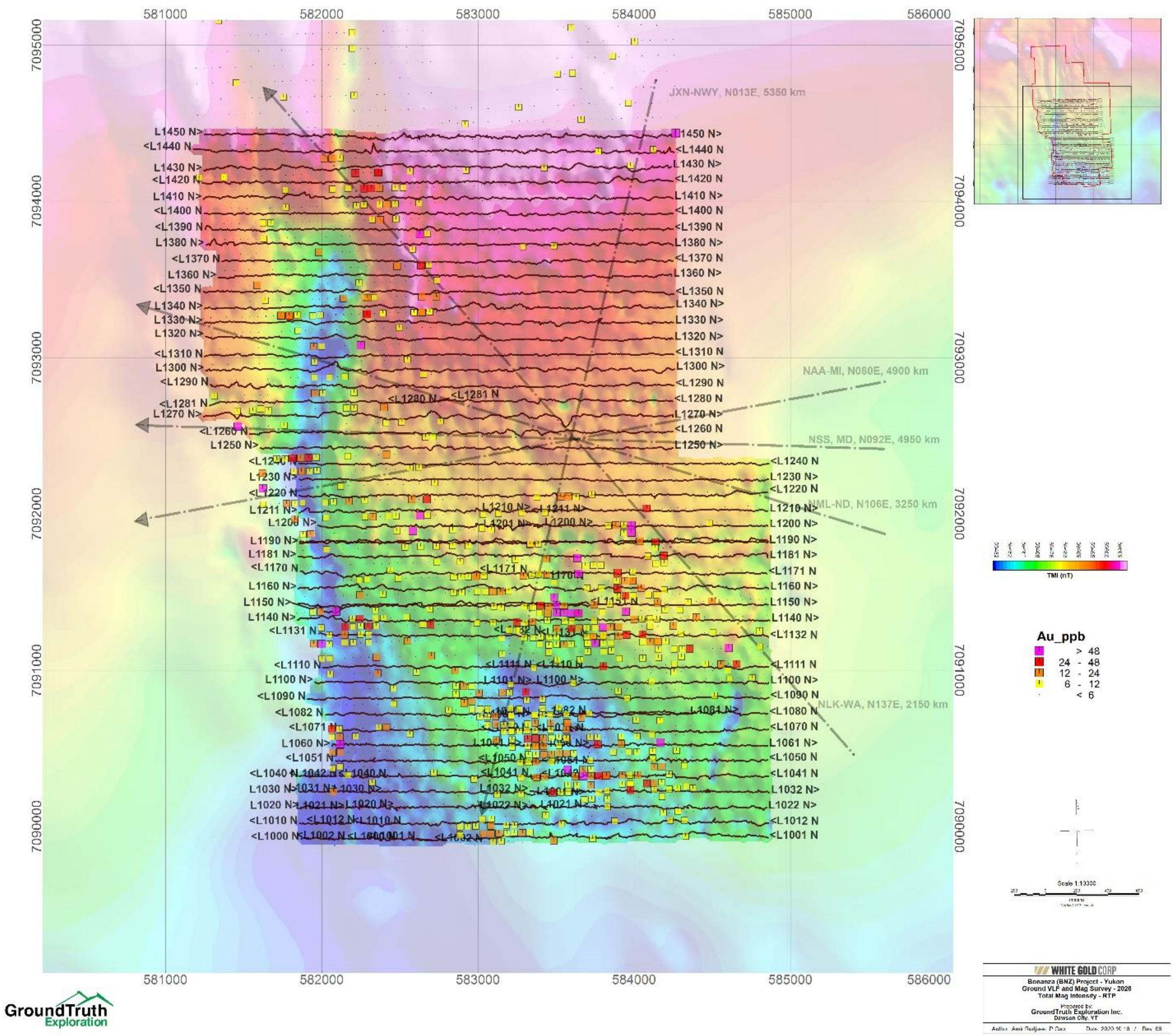


Figure 10: Total Magnetic Intensity RTP from ground magnetic survey 2020.

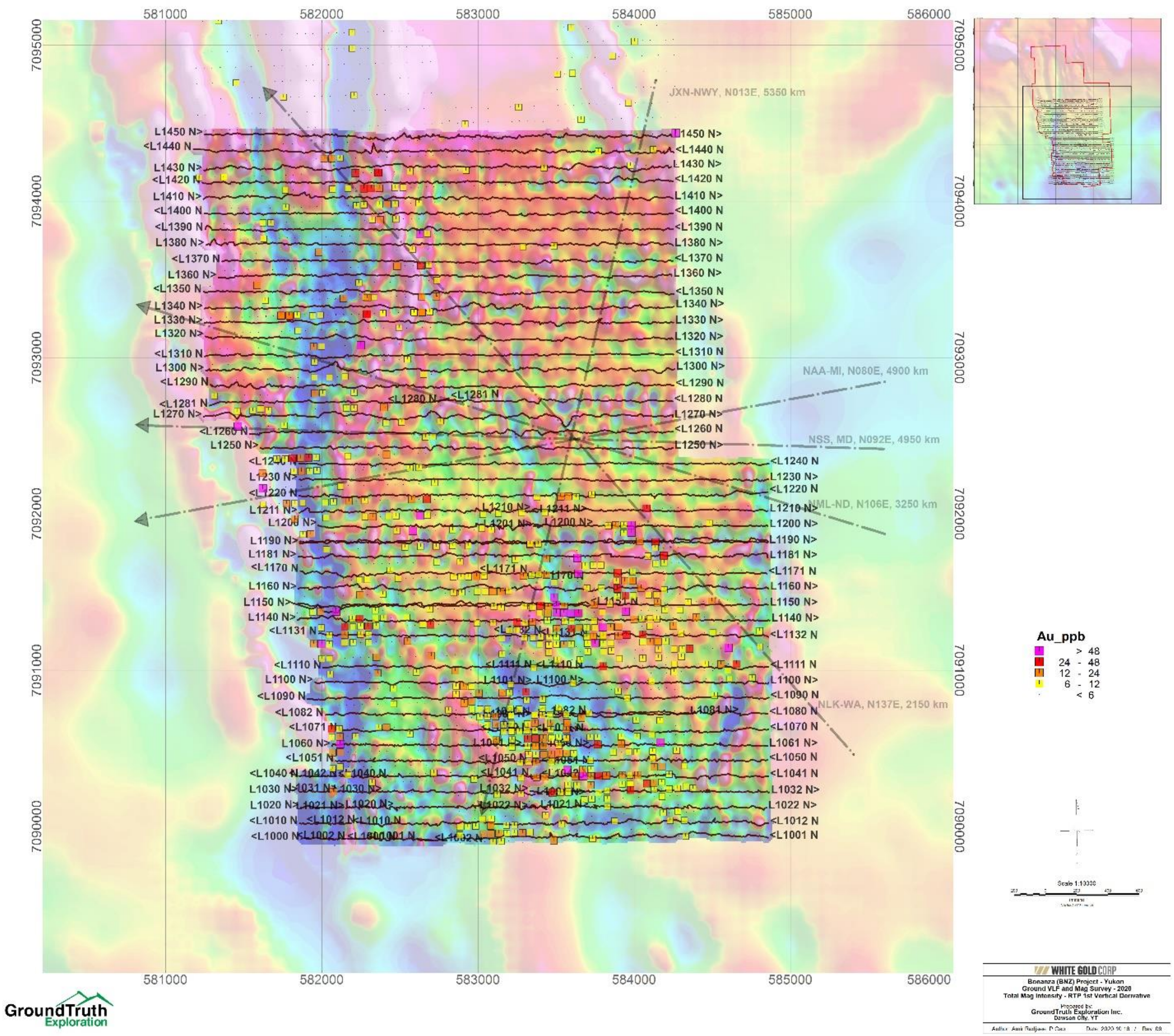
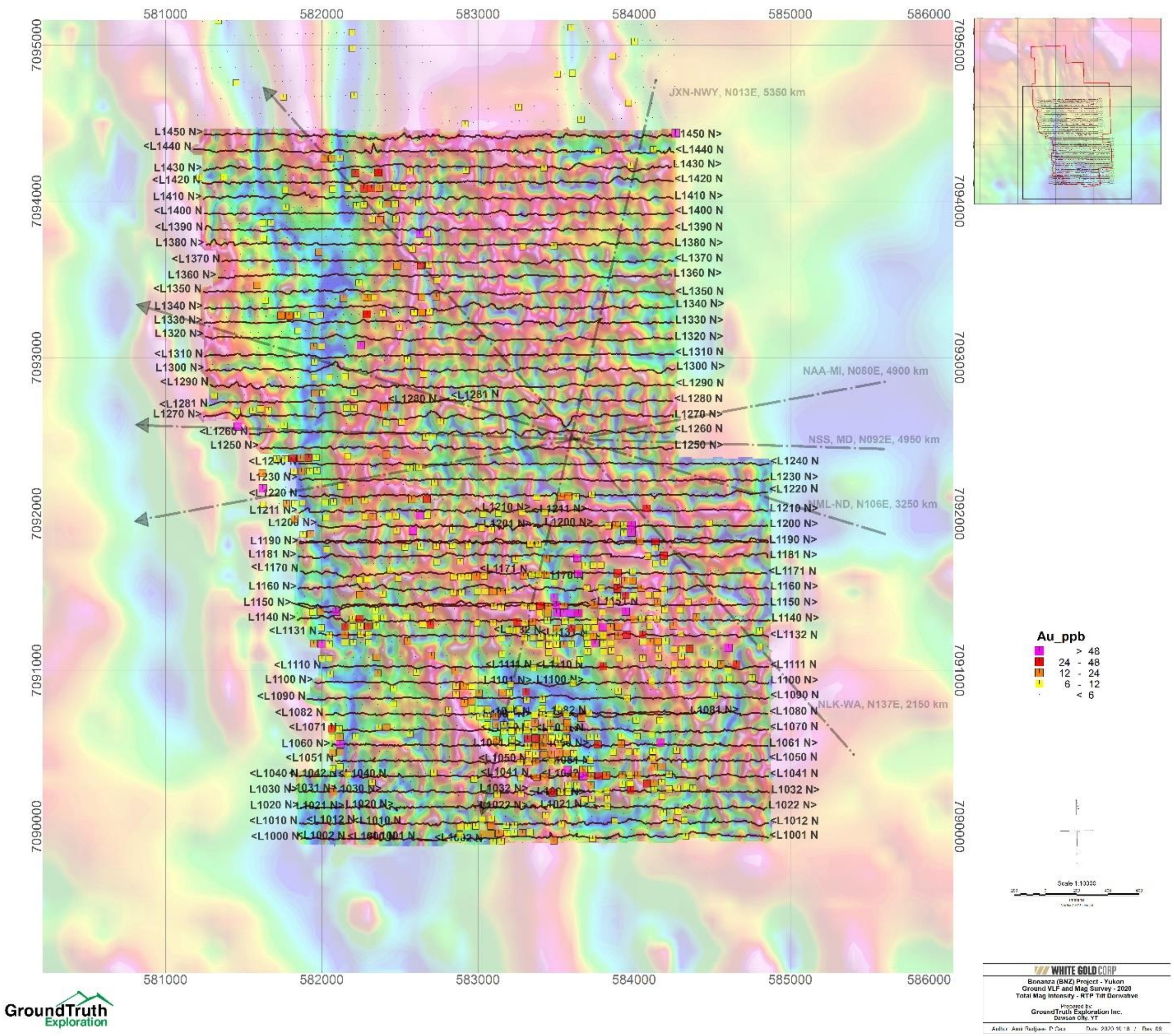


Figure 11: First Vertical Derivative of RTP from ground magnetic survey 2020.



GroundTruth Exploration

Figure 12: Tilt Derivative of RTP from ground magnetic survey 2020.