Technical Report
Geophysical VLF-EM Ground Survey

Bishop Property
MB2-18/YE27702-27718 Claim Series
Center UTM-7N X=596900, Y=7061500
NTS 115O11
Dawson Mining District, Yukon

Field Work Performed August 15th to 17th, 2016, for

TAKU GOLD CORP.

Taku Gold Corporation
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Report by Joël Dubé, May 23rd 2017

Dynamic Discovery Geoscience

Prepared by
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May 2017

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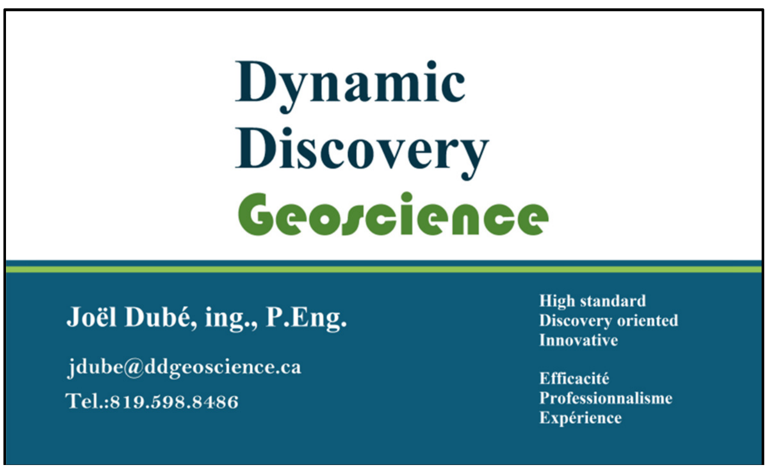

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I. INTRODUCTION

At the request of the mineral exploration company Taku Gold Corporation, the exploration services company Breakaway Exploration Management Inc. of Val-d'Or (QC) conducted a Very Low Frequency Electro-Magnetic (VLF-EM) survey on the Bishop Project (Figure 1). The consulting firm Dynamic Discovery Geoscience Ltd. of Ottawa (ON) received the mandate to control the quality of the survey, to process the acquired data and to present and interpret these data in the current report.

Figure 1: General location of the Bishop Project

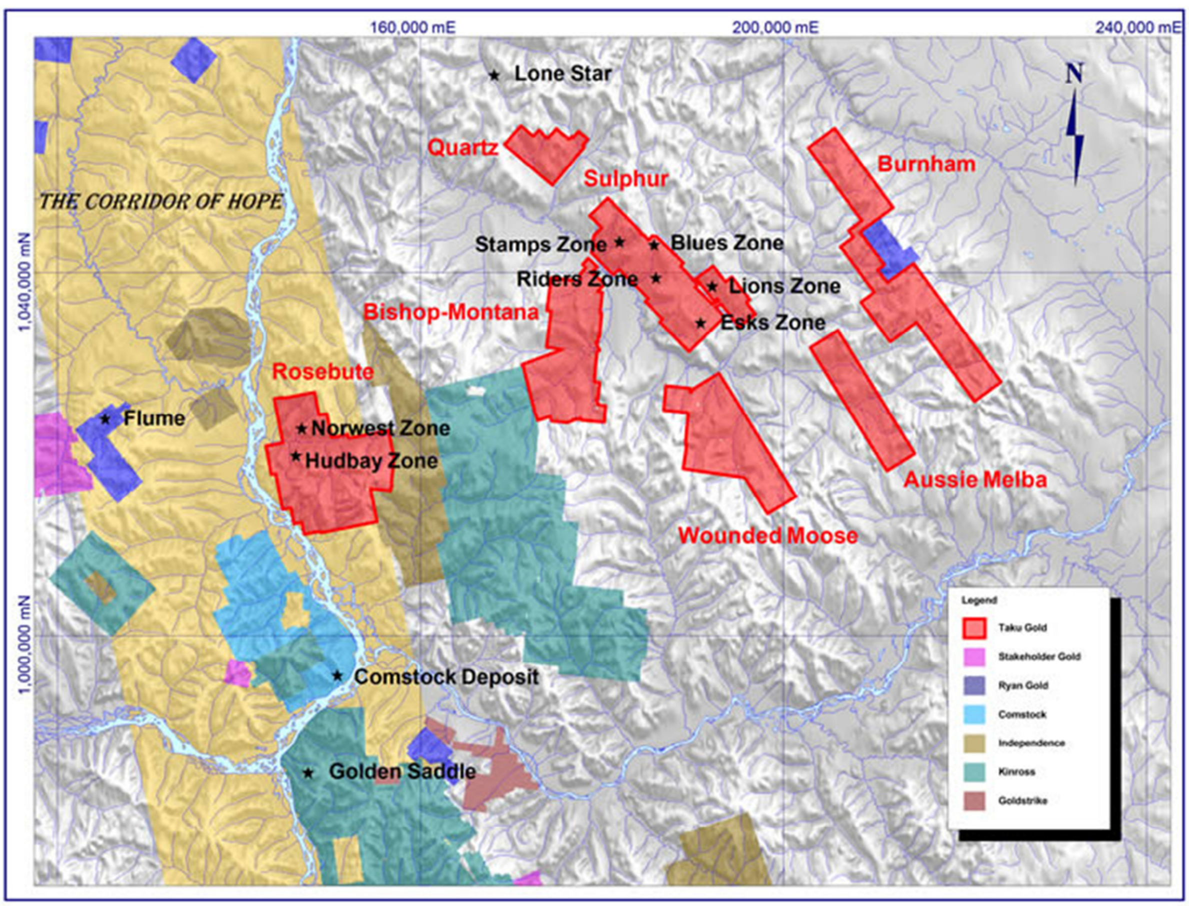
The survey was conducted from August 15th to 17th, 2016, by Mr. Marty Huber and Josh Judson, under the supervision of Mr. Mark Fekete, P.Geo., for a total of 23.4 linear km.

The goal of the survey was to characterize the sub-surface rocks with respect to their signature to the VLF-EM method, and to identify responses possibly associated to mineralized occurrences. In order to provide assistance in the data interpretation process, airborne magnetic data acquired in the area in 2000 are also used (Stewart River I survey, available at Natural Resources Canada, 2017).

II. BISHOP PROJECT

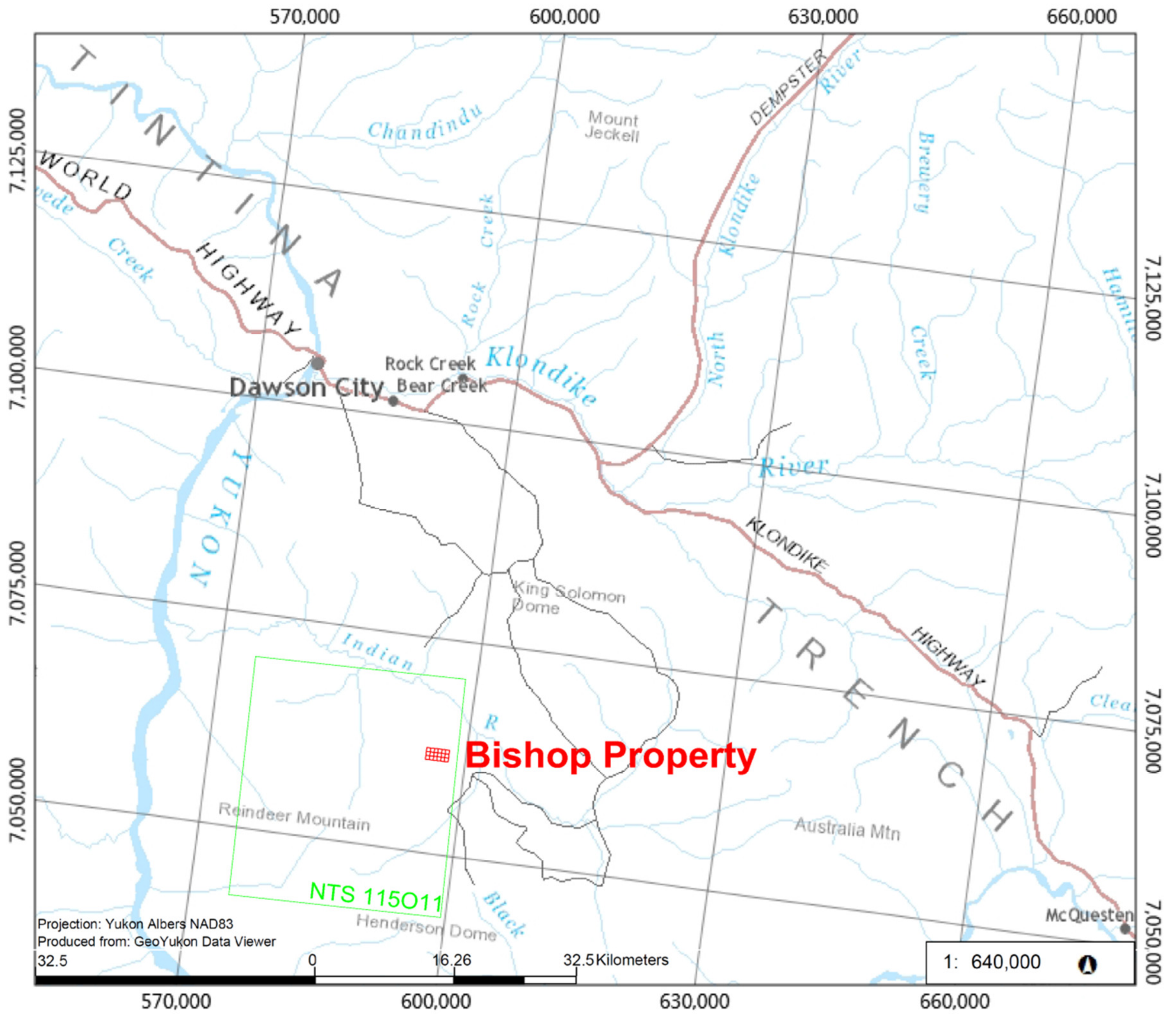
The Bishop Property consists of a block of mineral claims located about 48 km southeast of Dawson City. This property is part of a constellation of properties owned by Taku Gold Corp. in the area, and shown in red in Figure 2.

Figure 2: Mineral properties south of Dawson City



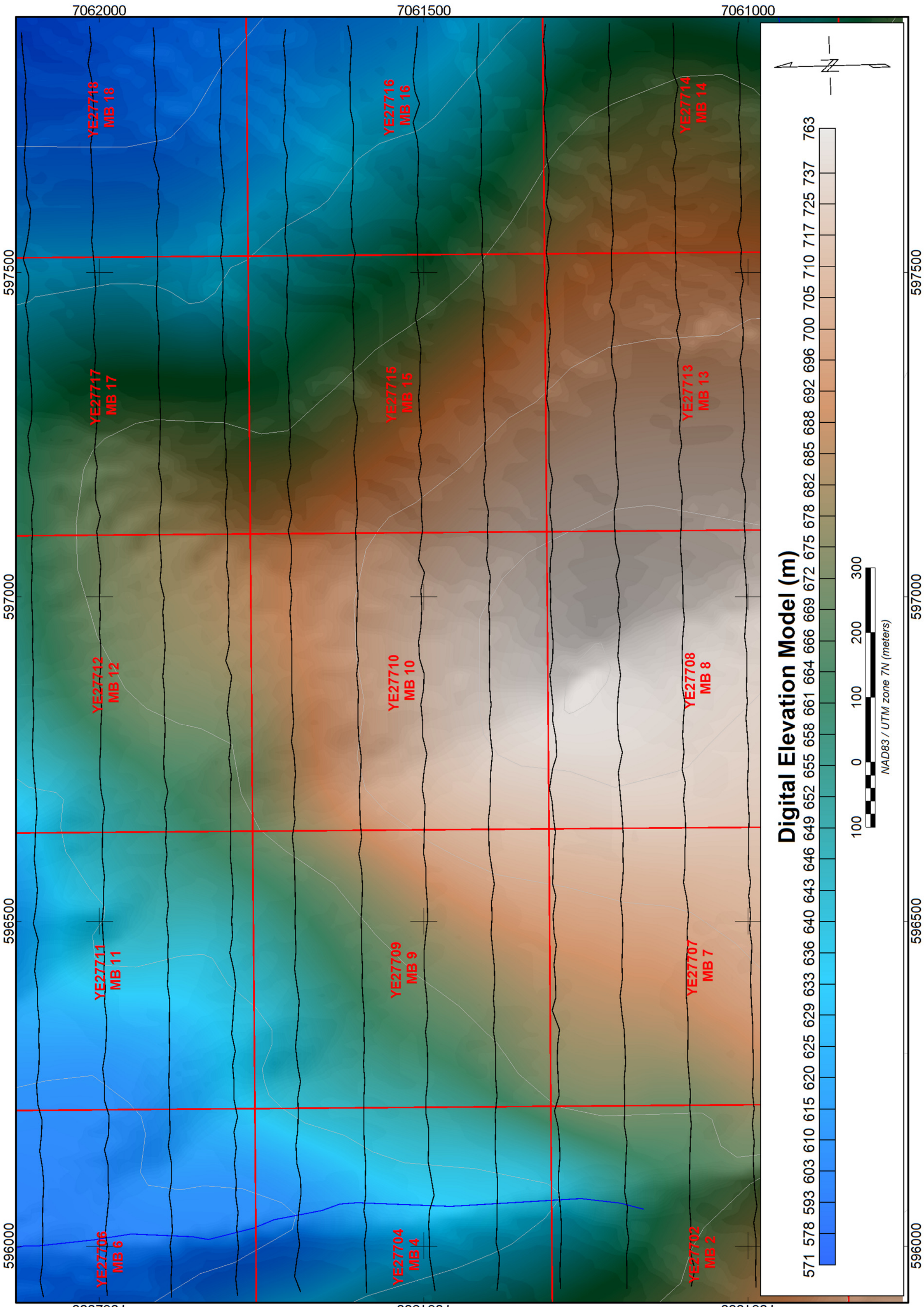
The Bishop Property claims are shown in Figures 3. Most of the Property has been covered by the VLF-EM survey. This zone can be accessed in the summer via secondary roads connecting to Dawson City.

Figure 3: Regional location of the Bishop Property and surveyed area



The Property is located within NTS map sheet 115O11. The survey grid consists of a network of 12 lines oriented N090 and spaced every 100 m. Survey lines are all 1950 m in length, for a total survey production of 23.4 km. The survey was carried out through the bush with the help of real-time GPS navigation, which made line cutting and chaining unnecessary. Mining titles covered by the survey lines are shown in Figure 4, and all the Bishop Property claims that have been at least partly covered by the survey are listed in Appendix A.

Figure 4: Survey lines and Bishop mineral claims location



III. TECHNICAL SPECIFICATIONS

Field Operations

The VLF-EM survey, totalling 23.4 km, was carried out from August 15th to 17th 2016, by Marty Huber and Josh Judson of Breakaway Exploration Management. VLF-EM data were recorded every 25 m along the lines, for a total of 948 data points collected. Technical supervision was provided by Joël Dubé, P.Eng. On top of data inspection performed on the field by the operators while conducting the survey and transferring the data to a computer, the data were transferred to Dynamic Discovery Geoscience's office in Ottawa to undergo full data QC.

Survey Equipment

The equipment used for the VLF-EM survey consisted of an EM-16 device manufactured by Geonics. The EM-16 VLF system enables measurements of the vertical in-phase (P) and out-of-phase (Q) components expressed as % of the VLF horizontal primary field, with a resolution of 1 %.

Two VLF transmitter antennae were used: NPM Lualualei, Hawaii, emitting at a frequency of 21.4 kHz and NLK Seattle, Washington, emitting at a frequency of 24.8 kHz. The Hawaii antenna is located about 4900 km from the survey block, at an azimuth of N206, while the Seattle antenna is at a distance of 2040 km in the N142 direction. This implies that conductors striking NNE-SSW are best coupled with the EM signal from the Hawaii antenna, while the Seattle antenna's signal is best coupled with NW-SE conductors. The 64 degrees difference between the primary field directions from both antennae ensures that no conductors are left undetected with this survey configuration. By convention, all VLF-EM measurements were made with the instrument facing N120 for the Hawaii antenna and N060 for the Seattle antenna, for proper polarity of the results.

A GPS unit was used both for navigation purposes along an ideal local grid (no lines were cut) and for recording of survey stations locations, with an absolute accuracy of 2 to 5 m.

IV. DATA PROCESSING AND PRESENTATION

Data compilation including editing and filtering, quality control (QC), and final data processing was performed by Joël Dubé, P.Eng. Processing was performed on high performance computers optimized for quick daily QC and processing tasks. Geosoft software Oasis Montaj version 9.1.3 was used.

VLF-EM data

The vertical in-phase and out-of-phase components are presented in profiles. The in-phase component was further processed with a Fraser filter which results in a signal with maximum amplitude at the inflexion point of the input signal. This parameter was interpolated onto a regular grid using a bi-directional gridding algorithm to create a two-dimensional grid equally incremented in x and y directions. The final grids were created with 20 m grid cell size, appropriate for the survey lines spaced at 100 m, and were filtered with a 3x3 Hanning filter to reduce short wavelength noise in the grids. The Fraser filtered in-phase component effectively enables identification of the conductors in an intuitive way by looking at maximum amplitude lineaments on its contour map.

Deliverables

The maps created to present the information extracted from the survey are summarized in Table 1. All maps are referred to NAD-83 in the UTM projection Zone 7 North, with coordinates in metres. Maps are at a 1:5,000 scale and are provided in PDF, PNG and Geosoft MAP formats.

Table 1: Delivered maps

No.	Nom	Description
1	DEM	Location of the survey lines and of the mineral claims
2	PQprof_Hawaii	VLF-EM in-phase & out-of-phase profiles for Hawaii antenna
3	P-FRASERcont_Hawaii	Fraser filtered VLF-EM in-phase contours for Hawaii antenna
4	PQprof_Seattle	VLF-EM in-phase & out-of-phase profiles for Seattle antenna
5	P-FRASERcont_Seattle	Fraser filtered VLF-EM in-phase contours for Seattle antenna
6	INTERPRETATION	Interpretation map with regional airborne Residual Total Field

Digital data are also supplied for all the parameters recorded during the survey. The database is delivered in the Geosoft GDB format. As well, data grids created for mapping purposes are included in the deliverables. They are referenced to NAD-83 in the UTM projection Zone 7 North, with coordinates in metres. Grids are provided in Geosoft GRD format, with a 20m grid cell size. Finally, interpretation elements found on the interpretation map are supplied in the Esri SHP format.

V. RESULTS INTERPRETATION AND DISCUSSION

Supporting data

Although no magnetic data were acquired as part of this project, public domain airborne magnetic data are presented here in an effort to support the interpretation process. The heliborne magnetic data used were acquired in 2000 with a 500 m line spacing at an altitude above the ground of 120 m, and is published by Natural Resources Canada (NRCan, 2017). This survey is referred to as the Stewart River I survey.

Magnetic data

The residual Total Magnetic Intensity (TMI) of the area is presented in Figure 5 together with interpreted features extracted from the interpretation map. The magnetic signal variations seen in the block are reflected in Table 2 which summarizes data statistics of the TMI.

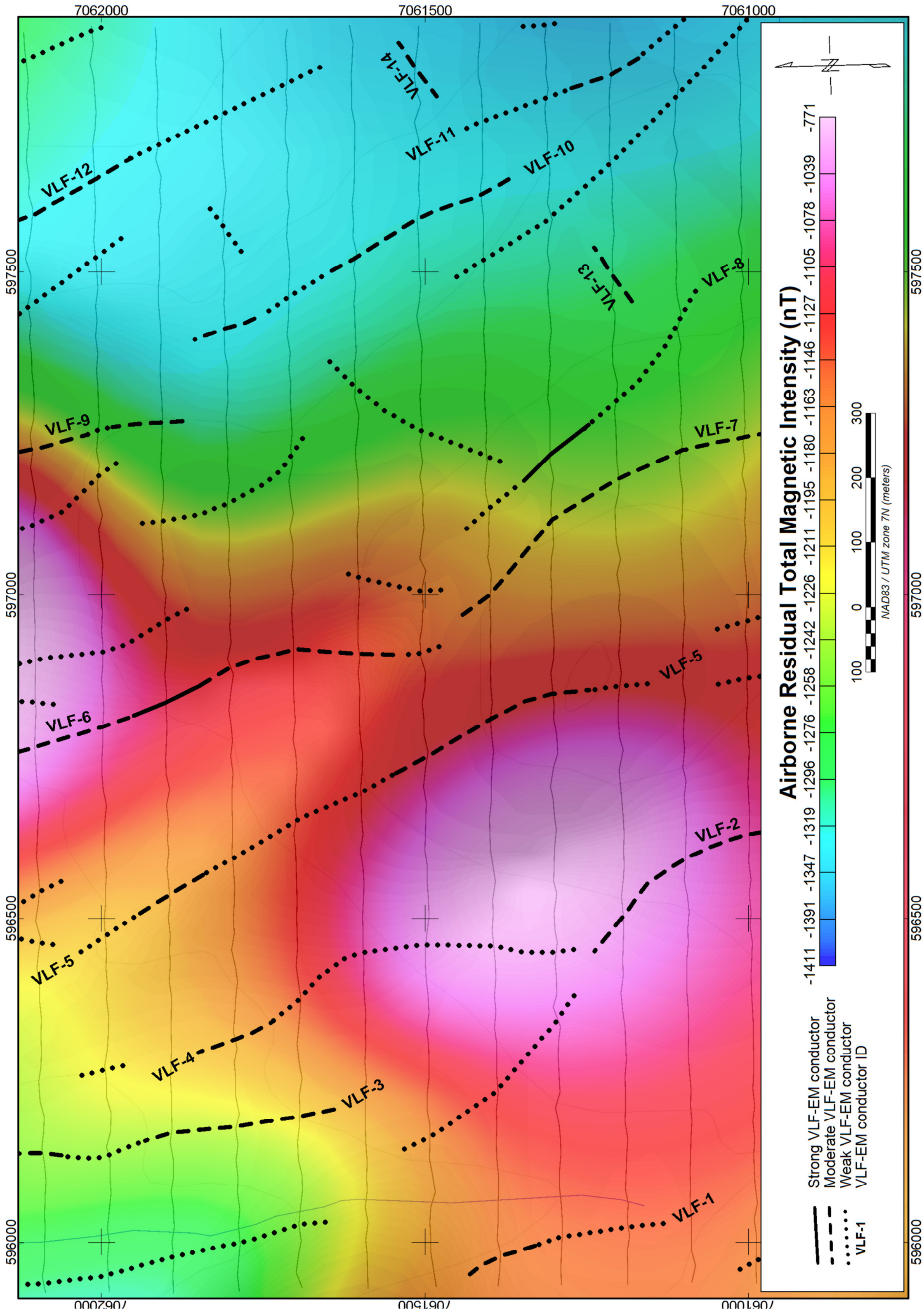
The area is characterized by two magnetic anomalies: one in the middle of the north edge of the survey grid, and the other in its south-west quadrant. The western half of the survey block is overall more magnetic than the eastern half. Areas with strong magnetic signal could relate to mafic/ultra-mafic rocks or to sulphides rich zones, while areas with depreciated magnetic background are more likely to relate to sedimentary rocks. The central part of the surveyed area could therefore represent an important contact zone generally trending N-S. The magnetic grain seems to indicate a general NNW-SSE trend of the geology, but this is possibly biased by the airborne survey lines oriented N048.

Given the low resolution of the available magnetic data (500 m line spacing), these data should be regarded as regional information only and are of limited use for direct local targeting since anomalies are not well defined. For the same reasons, definition of local faulting structures is impossible based on these magnetic data.

Table 2: Residual Total Magnetic Intensity statistics

Statistic	TMI (nT)
Minimum	-1411
Maximum	-771
Median	-1210
Mean	-1209
Standard Deviation	111

Figure 5: Airborne Residual Total Magnetic Intensity and geophysical interpretation



VLF-EM data

VLF-EM anomalies have been identified by looking at both the in-phase and out-of-phase components for typical cross-over patterns, in conjunction with the Fraser-filtered in-phase contours, which aim at making the cross-over detection easier. The Fraser-filtered data are shown on Figure 6 for the NPM Hawaii antenna and on Figure 7 for the NLK Seattle antenna. The results are generally similar for both antennae in most areas (confirming that the results are of good quality), except for conductive features that are rather oriented WNW-ESE (poorly coupled to Hawaii antenna) or NE-SW (poorly coupled to Seattle antenna), which is expected when coupling between antennae used is at a high angle such as in this case. Since the results from the Seattle antenna appear less disturbed and more continuous, it tends to show that conductors found in the area are mostly trending NW-SE to NNW-SSE. The interpretation of conductive axes has therefore been carried out looking at results for both antennae simultaneously, but with precedence of results of the Seattle antenna over those of the Hawaii antenna.

Interpreted anomalies have been classified as weak (dotted black lines), moderate (dashed black lines) and strong (continuous black lines) based on the amplitude of the vertical components and the out-of-phase signal behaviour relative to the in-phase signal. For instance, strong conductors will generate an out-of-phase response that is opposite in sign to the in-phase component (reversed cross-over). Among the anomalies that have been outlined on the interpretation products, the few that were stronger and appearing related to possible mineralisation were identified with an ID number starting with the 'VLF' prefix. Based on the strength of the VLF-EM conductor, its continuity over several lines or its association to a magnetic anomaly, a priority number (1 being prioritized) has been given to each VLF-EM conductor axis in order to guide follow-up efforts. This information, together with the approximate strike length, the magnetic signature association and some comments for each conductive axis, are listed in Table 3. Out of the 14 VLF-EM conductors identified in the survey area, 1 is deemed of first priority, 8 of second priority and 5 of third priority.

It is important to mention that strong topographic features are known to affect the VLF-EM results (Nabighian, 1991). For instance, prominent ridges will cause a response typical of a conductor, while deep valleys will cause a reversed anomaly. However, these effects are dependent on the resistivity of the ground and cannot be corrected for since this parameter is unknown a priori. In the Bishop Property, it is possible that the NNW-SSE gentle ridge associated to the VLF-5 axis is contributing, at least partly, to generate this anomaly. This being said, it is also possible that a bedrock conductor is running parallel to this subtle ridge. Figure 8 shows the Digital Elevation Model (DEM) data together with the VLF-EM interpretation.

The interpreted VLF axes are mostly trending from NW-SE to NNW-SSE, but a few marginal ones are possibly trending N-S to NE-SW. In some cases, a few conductors appear to show correlation to the magnetic data locally, but, again, this is difficult to confirm given the weak resolution of the magnetic data. In some other cases, in particular in the postulated N-S contact zone found in the middle of the grid, conductive axes rather appear to highlight discontinuities in the magnetic signal. This suggests that some conductors may actually be associated to faults, fractures or shear zones. The overburden troughs, clay minerals or mineralization often found in association with fault structures can explain their conductive nature and hence their response to the VLF-EM method. Such structural features are known to enable the circulation and precipitation of mineralizing fluids. Consequently, VLF-EM axes that appear to denote such type of structure should definitely be investigated further.

Table 3: Interpreted VLF-EM anomalies

ID	Length (m)	Priority	Magnetic association	Comments
VLF-1	200	3	None	Weak to moderate VLF-EM conductor. Open to W.
VLF-2	200	2	Near strong high	Weak to moderate VLF-EM conductor. Possible continuity of VLF-4 conductor. Open to S.
VLF-3	400	2	None	Weak to moderate VLF-EM conductor. Open to N.
VLF-4	500	2	Near strong high	Weak to moderate VLF-EM conductor. Possible continuity of VLF-2 conductor.
VLF-5	800	2	Between two magnetic highs	Weak to moderate VLF-EM conductor. Associated to topographic ridge.
VLF-6	600	1	Near strong high	Weak to strong VLF-EM conductor. Possible continuity of VLF-7 conductor. Open to N.
VLF-7	400	2	At contact between high and low	Weak to moderate VLF-EM conductor. Possible continuity of VLF-6 conductor. Open to S.
VLF-8	300	2	At contact between high and low	Weak to strong VLF-EM conductor.
VLF-9	200	2	At contact between high and low	Moderate VLF-EM conductor. Possible continuity of VLF-10 conductor. Open to N.
VLF-10	400	3	Moderate low	Weak to moderate VLF-EM conductor. Possible continuity of VLF-9 and 11 conductors.
VLF-11	300	3	Moderate low	Weak to moderate VLF-EM conductor. Possible continuity of VLF-10 conductor. Open to E.
VLF-12	400	2	Moderate low	Weak to moderate VLF-EM conductor. Open to N.
VLF-13	N/A	3	None	Moderate VLF-EM conductor. Only seen on Hawaii antenna data.
VLF-14	N/A	3	None	Moderate VLF-EM conductor. Only seen on Hawaii antenna data.

Figure 6: Hawaii Fraser filtered in-phase component and geophysical interpretation

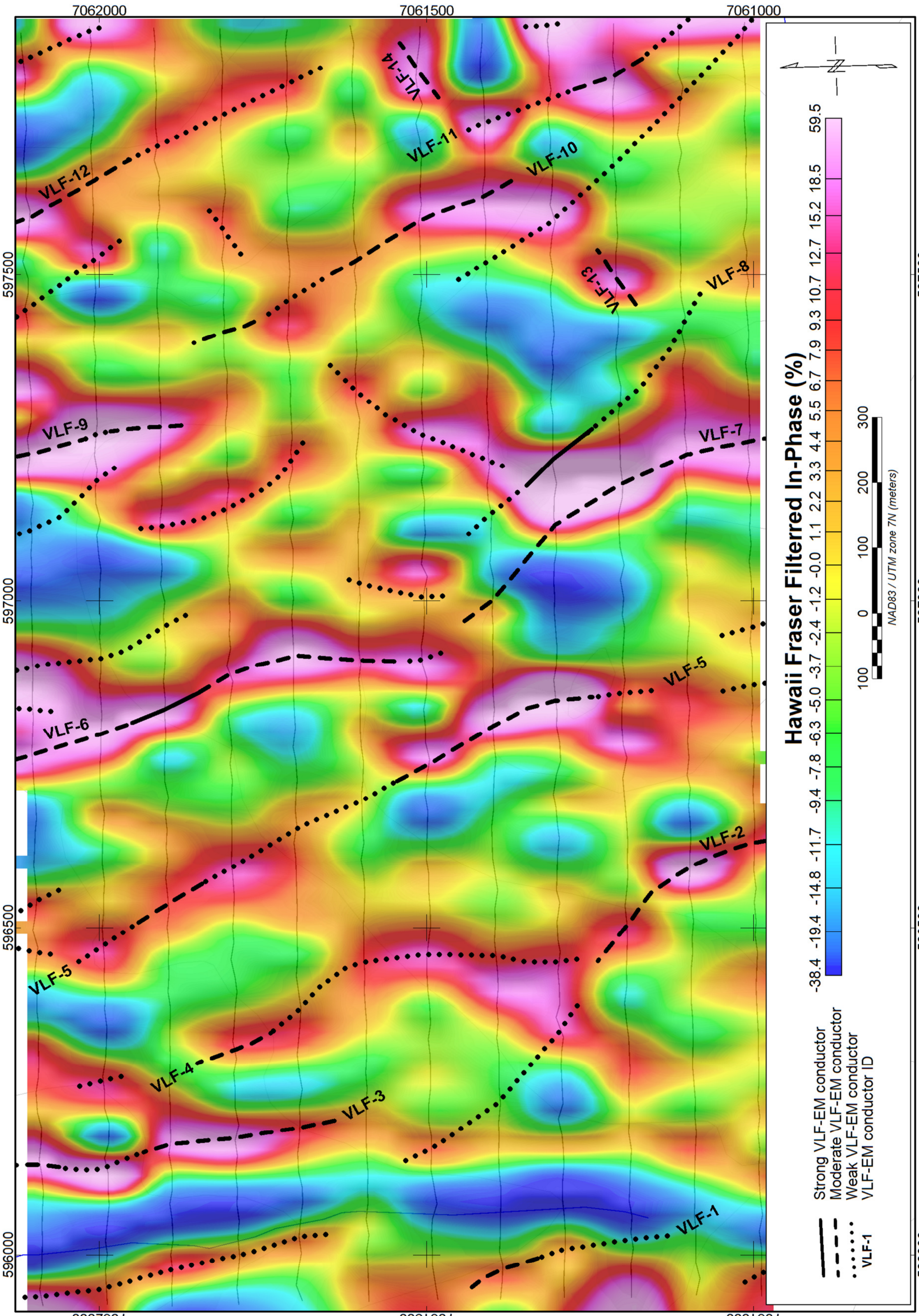


Figure 7: Seattle Fraser filtered in-phase component and geophysical interpretation

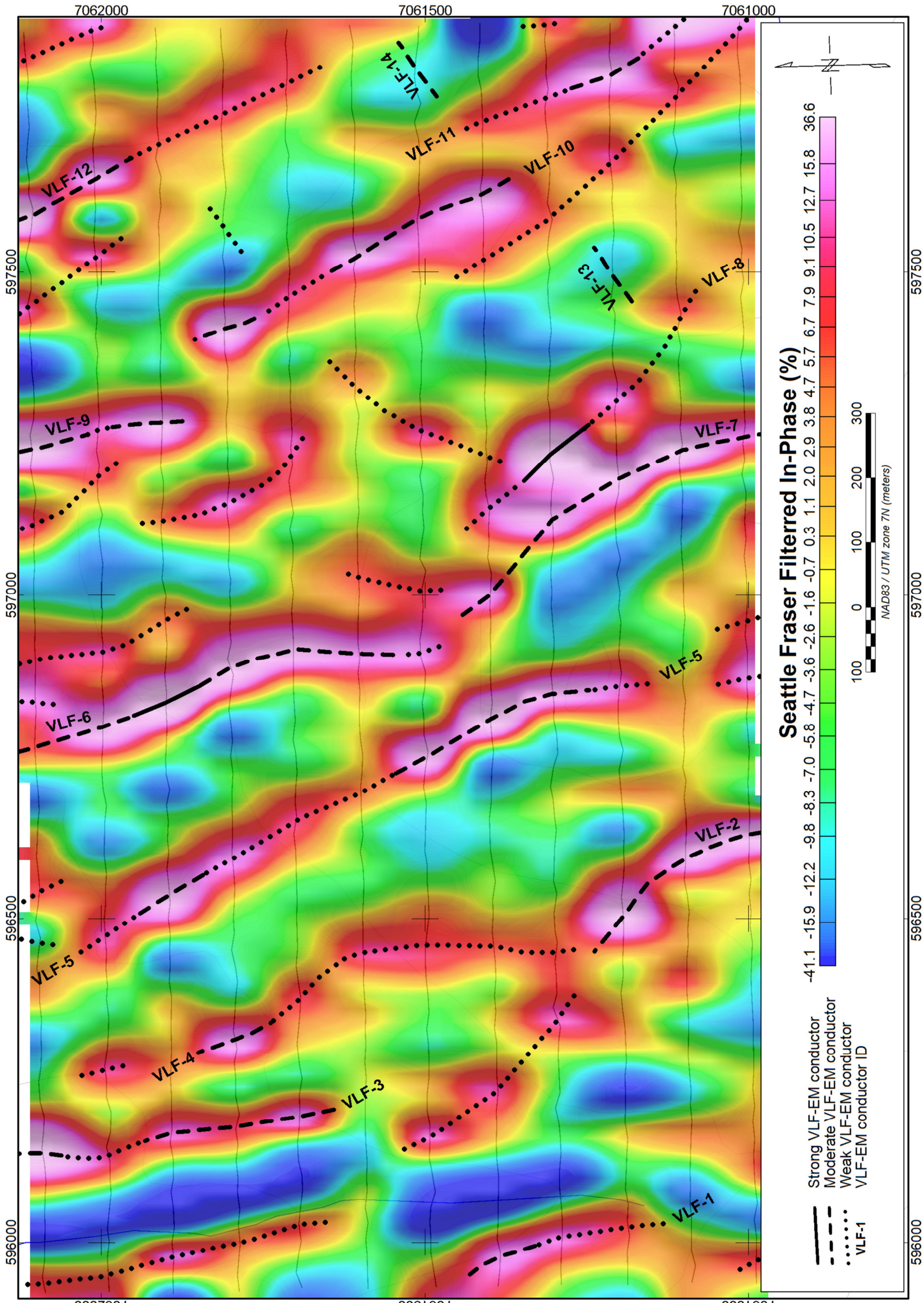
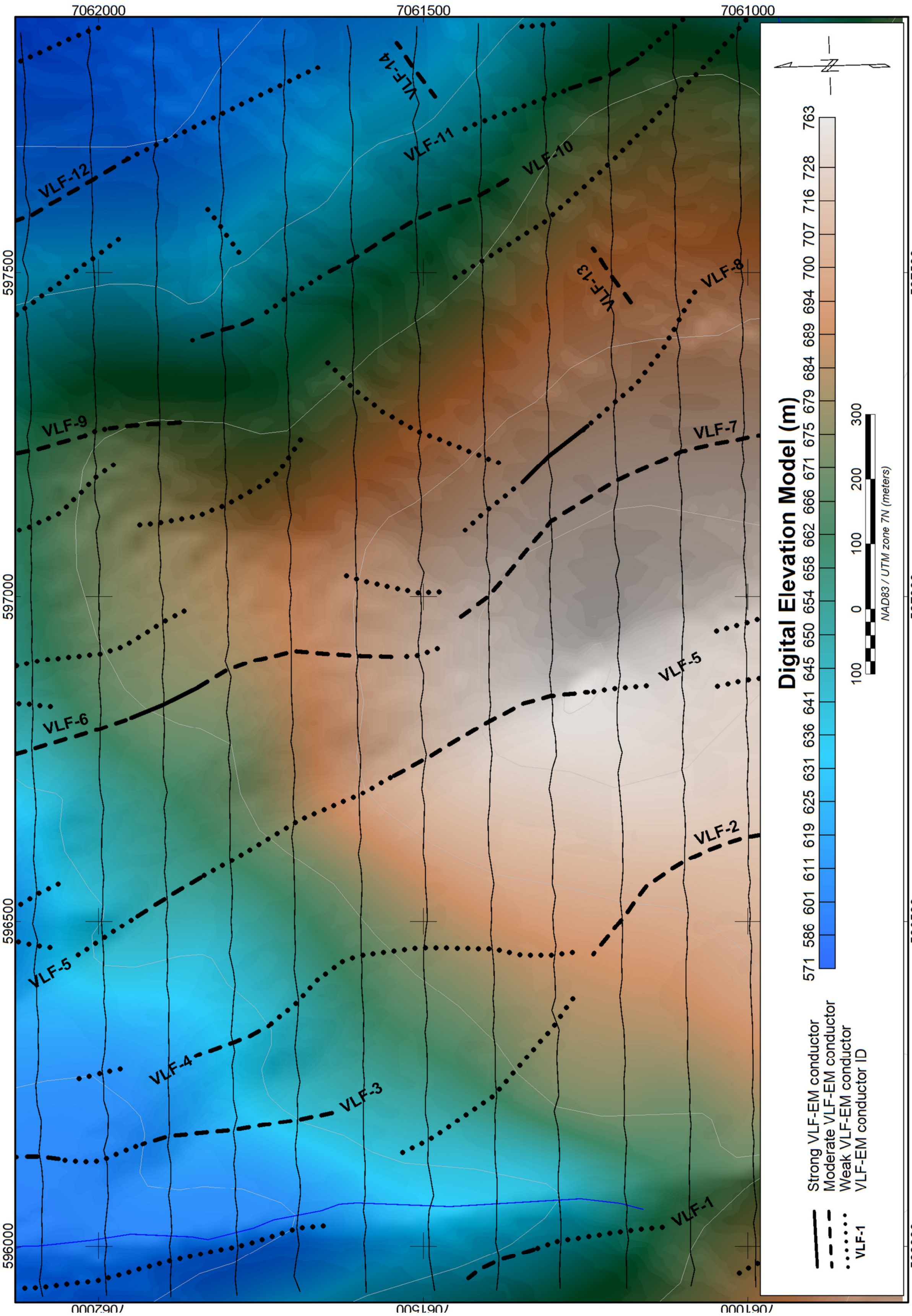


Figure 8: Digital elevation model and geophysical interpretation



Recommendations

It is worth mentioning that the penetration of the VLF-EM method is relatively weak compared to other methods. It is estimated in the order of 40-60 m in resistive areas, but can go down to 4-5 m in very conductive environments. However, this limitation is greatly compensated for by the limited efforts and expenses that must be deployed to acquire the results, which makes it a very efficient reconnaissance tool. The limited penetration depth of the method also implies that simple ground prospection and stripping techniques are usually sufficient to perform follow-up and determine the nature of the sources.

It is therefore recommended to investigate the outlined conductive anomalies by basic prospection methods, using the provided interpretation map and table as a guide to prioritize this reconnaissance effort. Areas where these VLF-EM conductors seem to cross-cut the magnetic signal could relate to fault structures and should be paid particular attention. Prioritization of targets should be revisited in light of other geoscience information such as geochemical and geological data.

Following a preliminary prospection phase, sources identified as promising for mineralization discoveries could then be the object of localized resistivity/IP surveys that can be efficiently used to penetrate the ground at further depth and better image the geometry of conductive and chargeable sources in preparation for drilling. This method has the advantage of responding to disseminated sulphide occurrences, to which gold mineralization is often associated.

VI. CONCLUSION

The VLF-EM survey conducted in August 2016 by Breakaway Exploration Management on Taku Gold's Bishop Property was successful in better characterising the physical properties distribution within the area, which could support a better understanding of the geological setting. In particular, several conductors were interpreted based on the results. Some of the VLF-EM conductors interpreted were identified as potential exploration targets and prioritized for further investigation. The survey parameters used and the general data quality of the survey were adequate to meet these objectives.

Respectfully submitted,

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Joël Dubé, P.Eng.
May 23rd 2017

VII. REFERENCES

Canadian Aeromagnetic Data Base (2017), Airborne Geophysics Section, GSC – Central Canada Division, Geological Survey of Canada, Earth Sciences Sector, Natural Resources Canada

Nabighian, M.N, 1991. *Electromagnetic Methods in Applied Geophysics, Vol 2;* Society of Exploration Geophysicists, p. 611

VIII. Statement of Qualifications

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I, Joël Dubé, P.Eng., do hereby certify that:

1. I am a Professional Engineer specialized in geophysics, President of Dynamic Discovery Geoscience Ltd, registered in Canada.

2. I earned a Bachelor of Engineering in Geological Engineering in 1999 from the École Polytechnique de Montréal.

3. I am an Engineer registered with the Ordre des Ingénieurs du Québec, No. 122937, and a Professional Engineer with Professional Engineers Ontario, No. 100194954 (CofA No. 100219617) and with the Association of Professional Engineers and Geoscientists of New Brunswick, No. L5202 (CofA No. F1853).

4. I have practised my profession for 18 years in exploration geophysics.

5. I have not received and do not expect to receive a direct or indirect interest in the properties covered by this report.

Dated this 23rd of May, 2017

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Joël Dubé, P.Eng. #100194954

IX. Appendix A – Bishop Property mineral claims covered

NTS Map Sheet	Grant Number	Mineral Claim Tag
115O11	MB 2	YE27702
115O11	MB 4	YE27704
115O11	MB 6	YE27706
115O11	MB 7	YE27707
115O11	MB 8	YE27708
115O11	MB 9	YE27709
115O11	MB 10	YE27710
115O11	MB 11	YE27711
115O11	MB 12	YE27712
115O11	MB 13	YE27713
115O11	MB 14	YE27714
115O11	MB 15	YE27715
115O11	MB 16	YE27716
115O11	MB 17	YE27717
115O11	MB 18	YE27718