ASSESSMENT REPORT TITLE PAGE AND SUMMARY

TITLE OF REPORT: Reconnaissance Airborne ZTEM survey Goose 1 Claim

TOTAL COST: $6,945.00

AUTHOR(S): **Peter Holbek**
SIGNATURE(S):

NOTICE OF WORK PERMIT NUMBER(S)/DATE(S):
STATEMENT OF WORK EVENT NUMBER(S)/DATE(S): **5663308 September 6/2017**
5676198 December 01/2017

YEAR OF WORK: **2016/2017**

PROPERTY NAME: **Goose**

CLAIM NAME(S) (on which work was done): **Goose 1**

COMMODITIES SOUGHT: **Ag, Zn, Au**

MINERAL INVENTORY MINFILE NUMBER(S),IF KNOWN:

MINING DIVISION: **Omenica**
NTS / BCGS: **93L/01W**
LATITUDE: **54° 10' 40**"
LONGITUDE: **126° 19' 13**" (at centre of work)
UTM Zone: **9** EASTING: **674900** NORTHING: **6006600**

OWNER(S): **Copper Mountain Mine B.C.**

MAILING ADDRESS: 550 **– 1700- 700 West Pender St, Vancouver, BC, V6C 1G8**

OPERATOR(S) [who paid for the work]: **Copper Mountain Mining Corp.**

MAILING ADDRESS: **As Above**

REPORT KEYWORDS (lithology, age, stratigraphy, structure, alteration, mineralization, size and attitude. (Do not use abbreviations or codes) **Cretaceous Skeena Group, Kasalka Group Lower Jurassic Hazelton Group, Ag-Zn Mineralization, breccia, lenticular discontinuous massive and semi-massive sulphide mineralization.**

REFERENCES TO PREVIOUS ASSESSMENT WORK AND ASSESSMENT REPORT NUMBERS: **17307,15967,14346, 09075, 05195, 03508, 02877, 02311**

TYPE OF WORK IN THIS REPORT	EXTENT OF WORK (in metric units)	ON WHICH CLAIMS	PROJECT COSTS APPORTIONED (incl. support)
GEOLOGICAL (scale, area)			
Ground, mapping			
Photo interpretation			
GEOPHYSICAL (line-kilometres)			
Ground			
Magnetic			
Electromagnetic			
Induced Polarization			
Radiometric			
Seismic			
Other			
Airborne	40 line km Electromag	Goose 1	$6945.00
GEOCHEMICAL (number of samples analysed for …)			
Soil			
Silt			
Rock			
Other			
DRILLING (total metres, number of holes, size, storage location)			
RELATED TECHNICAL			
Mineralographic			
Metallurgic			
PROSPECTING (scale/area)			
PREPATORY / PHYSICAL			
Line/grid (km)			
Topo/Photogrammetric (scale, area)			
Legal Surveys (scale, area)			
Road, local access (km)/trail			
Trench (number/metres)			
Excavator test pits			
Other			
		TOTAL COST	**$6,945.00**

2016 Reconnaissance ZTEM Survey

on the

Goose Property

Tenure Number

1046731

Mining Division: Omineca

NTS Map Sheet: 93 L 1 W

Latitude: 54° 11' N
Longitude: 126° 20' W

Owner of Claims: Copper Mountain Mining Corp.

Project Operator: Copper Mountain Mining Corp.

Report by: Peter Holbek, MSc., P.Geo.
and
Richard Joyes, BSc.

Date of Report: November 30th, 2017

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1. Introduction

1.1 Location and Access

The Goose property (Goose 1 Claim) is situated approximately 32km southeast of Houston, B.C. and is immediately northeast of the eastern end of Sam Goosly Lake, on NTS map sheet 93L 1W (Figure 1.1, and 1.2). The Goose property forms an approximate 2.0 by 2.5 km rectangle that with central co-ordinates of 673850E, 6008250N (NAD83 Zone 9; Lat: 54^{o} 11’ and Long 126^{o}, 20’).

The properties are easily accessed by the Equity Mine road and Forest Service roads from Houston, B.C. All roads are easily observed on Google Earth images. Figure 1.2 shows claims overlain on a Google Earth image illustrating the location of forestry roads and cut blocks.

Figure 1.2: Claim map, with Goose 1 claim outlined in blue on the northeast side of Goosly Lake.

Figure 1.1 Project Location Map.

1.2 Climate and Physiography

The project area is at moderate elevations in north-central British Columbia, on the eastern side of the Coast Range Mountains. Climate is similar to that of Houston and Smithers with cold, but relatively dry, winters and moist, cool summers. Vegetation, prior to logging consisted of spruce, fir and hemlock, or spruce and pine forests; depending on elevation. Much of the area has been logged or burned in forest fire, and the area is in various states of forest re-generation. Stream gullies may contain relatively thick undergrowth. Some of the low-lying areas, adjacent to Goosly Lake, are too damp for forest growth, with periodic flooding due to beaver activity, and support swamp and marsh flora.

Physiographically, the project area is situated on the northeastern edge of the Nechako Plateau. The property areas have low to moderate relief with elevations varying from 900m at Goosly Lake and sloping up to the northeast to a plateau at slightly over 1,200m. There is limited outcrop on the property, mostly restricted to road cuts at higher elevations on the eastern edge of the property. Much of the claim area, particularly at the lower elevations has gentle topography and is blanketed by relatively thick deposits of glacial debris.

Goosly Lake is oriented in a NW-SE direction and lies in a broad glacially carved valley. Ice flow direction is uncertain but may have originally been from west to east but flowing around the plateau in an east-southeasterly direction with the possibility of a reversal of direction with the waning of the large ice sheet.

1.3 Property Description

The property is composed of a single mineral tenure (1046731) as displayed in Figure 1.2. The claim is owned and operated by Copper Mountain Mining Corp.

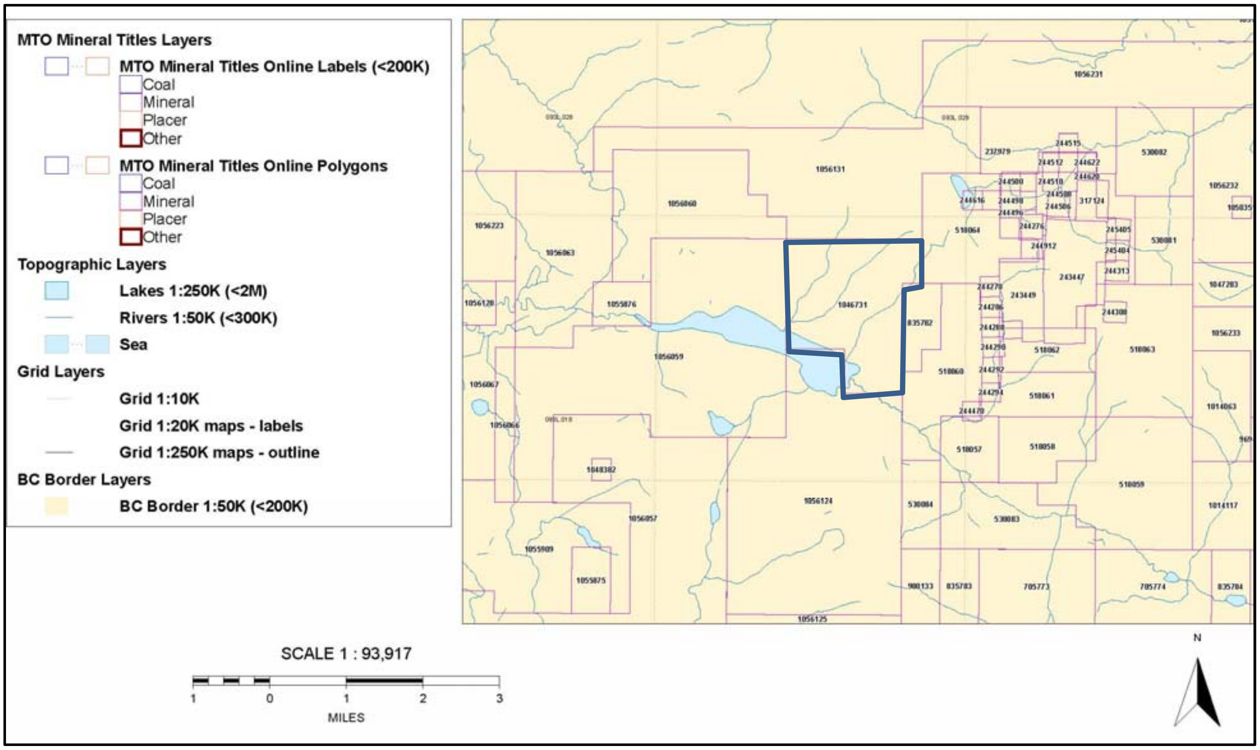


Figure 1.2: Claim map, with Goose 1 claim outlined in blue on the northeast side of Goosly Lake.

1.4 Property History

The property history is closely tied into the history of the Equity Silver Mine which is immediately adjacent. Kennco Explorations (Western) Ltd. undertook a large regional geochemical survey in the early 1960's, which included the Goosly Lake area, where numerous drainages returned anomalous values for Cu, Zn, As, and Ag. Follow-up soil sampling defined areas of anomalous Cu, Ag, Mo and F, which coincided with the discovery of tetrahedrite bearing altered volcanic rocks in the same area. The resulting diamond drill program discovered unusual Ag, Cu, Sb, Au, As mineralization, and eventually delineated a potentially economic sulphide deposit, termed Sam Goosly, which went into production as the Equity Silver mine in 1979.

Discovery of the Sam Goosly deposit led to a staking rush and much work in the area. The Goose 1 claim covers part of an area that was originally staked by Dorita Silver Mines Ltd. in 1969. Dorita carried out geochemical surveys, and optioned the property to Silver Standard Mines, who carried out additional work including IP surveys but the actual locations of this work is uncertain. Dorita abandoned the ground in 1971. Subsequently, Payette River Mines Ltd. stacked the area and conducted a 9.5 line km IP survey that defined a small chargeability anomaly on the slopes northeast of Goosly Lake (again location is uncertain). Payette tested the IP chargeability anomaly with four percussion drill holes, three of which managed to reach bedrock. The percussion holes intersected pyritic felsic volcanic rocks with anomalous Zn, Ag and As but no 'ore grades' and having explained the chargeability anomaly no further work was recorded. At some point in time, Faraway Gold mines conducted work and intersected Quartz-muscovite altered rock with anomalous Zn and Ag in the vicinity of Goosly Lake as referenced in a 1985 Assessment Report (14346) for KenGold Mines which conducted work immediately to the West of Faraway Gold Mine's claims. KenGold's property was optioned to Normine resources who carried out a percussion drilling program over a wide area, and describe up to 96m of till depth along the northeastern shore of Goosly Lake and also the interception of altered pyritic tuff with anomalous values of As, Mn, Pb, Sb, Au and Ag in an area believed to be within the area of the current Goose 1 claim.

The most significant work carried out on the property was a large drill program conducted in 1987 by Cordilleran Engineering for Equity Silver Mines on the Faraway Gold Mines Ltd, property. Equity completed 5,927m of drilling in 37 holes. Drill hole depths ranged between 100 and 300m and covered an area approximately 1000 by 400m. The results of this drilling are summarized in the quote below taken from the conclusions of Donkersloot (1988).

"*Most of the rocks intersected on the property are part of a series of moderately to strongly altered andesite, tuffs and volcanic breccias which belong to either the Goosly sequence or the Cretaceous Tip Top Hill volcanic package. Un-mineralized mudstone and conglomerate were found in the on the southern part of the property and are probably part of the basal clastic division of the Goosly sequence. Unaltered Tertiary volcanic rocks are found on the northwestern part of the claim.*

Minor ten cm to three m wide intervals of massive to semi-massive sulphides (mainly pyrite) were found within moderately altered tuffs and breccias. Some of these sulphide intervals contained up to 715 g/t silver and 9.5% zinc, but the majority contain between 30 and 100 g/t Ag and 0.15 to 1% zinc. A 70 to 200 m wide zone with pervasive tan to white coloured carbonate-quartz-sericite alteration was found north of the sulphide-rich zone. This altered zone contains 10 to 35% pyrite, but did not yield any significant assays."

No additional work has been recorded since the above.

1.5 Work Program

Airborne Geophysical Surveys were contracted to fly the survey which took place on September 20-23rd, 2016. The crew was based out of Houston, BC for the acquisition phase of the survey of which they flew a total of 240 line km's. The survey itself, consisted of a helicopter-borne AFMAG Z-axis Tipper electromagnetic (ZTEM) system and aero magnetics using a caesium magnetometer. Lines were flown in an east-northeast orientation with traverse line spacing of 200 and 300 metres and tie lines every 3000 metres. Individual lines were 10.4 kilometres in length.

The on-board operator was responsible for monitoring the system integrity. A detailed flight log was also maintained by the operator during the survey, tracking the times of flight as well as any unusual geophysical or topographic features. Copper Mountain Mining Corp. conducted a regional compilation of the district focusing on the presence of Ag, Zn, Pb, Au associated with felsic volcanic rocks in conjunction with exploration on its Fenton Project. To further evaluate mineralization at the Fenton project an Airborne ZTEM and Aeromagnetic survey was contracted to be flown. Additional areas of interest in the district were also flown. ZTEM survey lines have a minimum length of 10km so partly as an aid with the interpretation of the ZTEM data, reconnaissance lines were flown over the Goose 1 Claim and extended over the Equity Silver deposit area.

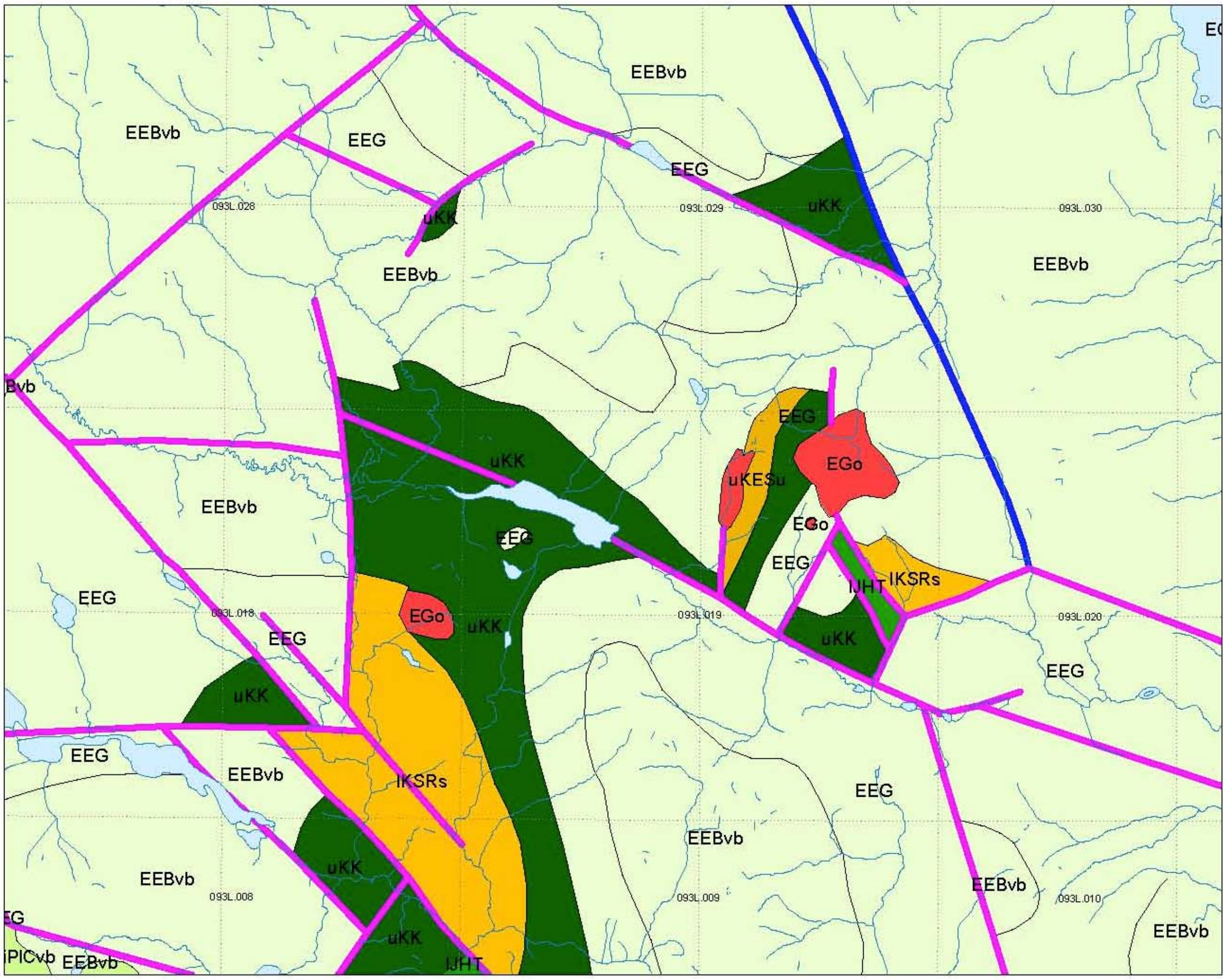
On return of the aircrew to the base camp the survey data was transferred from a compact flash card (PCMCIA) to the data processing computer. The data was then uploaded via ftp to the Geotech office in Aurora for daily quality assurance and quality control by qualified personnel.

2. Geology and Mineralization

2.1 Regional Geological Setting

The project area is situated east of the Coast Range in the southern part of the Skeena arch, an 'uplifted' area of Mesozoic to Tertiary volcanic rocks, related intrusions, and derived sedimentary rocks, that forms a wedge-shaped area within the west-central part of the Stikinia tectonic terrane. Tectonic deformation in early Cretaceous time resulted in extensive block faulting of the Skeena Arch with principle directions of breakage along northeast and northwest trends. These faults appear to have been defined, at least in part, by airborne magnetics as illustrated in the regional geological map and regional magnetics.

The property area is on the southwestern flank of an erosional window through Eocene basaltic flows of the Endako Group. The Equity mine area is within the erosional window where sedimentary and volcanic rocks of the Cretaceous Skeena Group are exposed. A simplified regional map centered on the Goose 1 claim as generated in MapPlace is presented as Figure 2.1.



Geology

Eocene

EEG	*Goosly Lake Fm - Trachyandesite, trachyte and basalt*
EEBvb	*Endako Group (Buck Creek Fm) - Basaltic volcanic rocks*
Ego	*Goosly Plutonic Suite -Syenomonzonite to gabbro*

Cretaceous

UKK	*Kasalka Group - Andesitic volcanic rocks*
UKESu	*Kasalka Group - Pyroclastic rocks*
IKSRs	*Skeena Group (Red Rose Fm) - Coarse clastic sedimentary rocks*

Figure 2.1: Regional Geology

2.2 Property Geology

A majority of the Goose 1 Claim is covered by a thick layer of glacial till until the northern edge where Eocene basalt flows are exposed at the higher elevations. The southern part of the claim is defined as Cretaceous Kasalka Group (Fig. 2.1), however, description of rocks intersected in the 1987 drill program (Donkersloot, 1988) would indicate that the rocks are possibly the same as the host rocks for the Equity mineralization. The non-mineralized rocks, which include grey-green conglomerate sandstone and mudstone which are thought to be basal clastic division of the Goosly sequence, whereas a majority of the drilling intersected strongly altered andesite tuffs, volcanic breccias with minor sandstone, and conglomerate interbeds, which are similar to the host rocks of Equity mineralization but not directly correlative.

2.3 Mineralization

The Equity Silver deposit is somewhat unique, both in form and content, being an intrusive related, polymetallic, disseminated to massive sulphide replacement, deposit. The origin of the deposit is not without controversy and will not be discussed here in detail. The mine, which closed in the late 80's, had pre-mining published reserves of 39.5 million tonnes grading 0.89g/t Au, 95.4g/t Ag, 0.33% Cu, 0.085% Sb (Church and Barakso, 1990) as well as undefined but abundant As and some Zn. The deposit was mined in two parts: the Southern Tail ore body and the main zone ore body. Mineralization in the Southern Tail is relatively high-grade and coarser grained sulphide mineralization in a zone 900m long and 40m wide with a moderate dip to the northwest; this zone was mined to a depth of 60m, although mineralization extends deeper, and produced 6.8mt grading 1.3g/t Au, 121g/t Ag, 0.48% Cu and 0.085% Sb. The Main zone deposit located about 500m to the northeast of the Southern Tail, is an ovoid shaped zone of fine grained disseminated sulphides with abundant small lenticular zones of very fine-grained massive sulphide. Mineralization is hosted by moderately dipping sedimentary strata adjacent to syenomonzonite-gabbro (Goosly) intrusion(s) of Tertiary (~50Ma) age. Both mineralization and alteration appear to be multi-episodic and the alteration suite of minerals is indicative of relatively high temperature which may be a contact metamorphic overprint related to slightly younger intrusive activity.

Mineralization intersected in the drill holes in the Goose 1 claim (Donkersloot, 1988) is described as crackle-breccia matrix sulphide and lenticular massive to semi-massive sulphide mineralization up to 3m in width. The mineralized breccias locally contained clay within the breccia matrix and are hosted by green-grey andesitic tuffs and breccias with some sericite-chlorite-quartz-carbonate alteration. The mineralization appears to form a zone with a 120 degree strike and steep northerly dip. North of the mineralized rocks is a 70 to 200m wide zone of distinctive tan to white coloured alteration containing up to 35% pyrite, trace amounts of arsenopyrite and chalcopyrite, but only one significant assay of 29 g/t Ag over 3.7m.

4. Conclusions and Recommendations

Although the property area has extremely limited exposure past work indicated local IP chargeability anomalies and later drilling confirmed the presence of alteration and mineralization with similarities to Equity Silver mine with respect to both host rocks and nature of the mineralization.   ZTEM data indicates conductive zones both under the southern part of the Equity mine and within the area of previous drilling on the Goose 1 claim; both zones display considerable depth extent. ZTEM data indicates more of a 160 degree trend to the zone rather than the 120 interpreted by Donkersloot (1988), as well as indicating that the ZTEM response is much wider that past work suggested.

It appears gold was not analyzed for in past work and with the abundance of sulphide mineralization in the previous drilling this should be considered.

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Appendix I: Statement of Expenditures

Helicopter Borne ZTEM electromagnetic and aeromagnetic survey

41 line km survey @ $145/km	$5,945.00
Logistics and Report Preparation	$1,000.00
Total	$6,945.00

Appendix II: Certificate of Qualifications

I, Peter M. Holbek with a business address of 1700 – 700 West Pender Street, Vancouver, British Columbia, V6C 1G8, do hereby certify that:

1. I am a professional geologist registered under the Professional Engineers and Geoscientists Act of the Province of British Columbia and a member in good standing with the Association of Professional Engineers and Geoscientists of British Columbia.
2. I am a graduate of The University of British Columbia with a B.Sc. in geology 1980 and an M.Sc. in geology, 1988.
3. I have practiced my profession continuously since 1980.
4. I am Vice President, Exploration for Copper Mountain Mining Corp. having a business address as given above.
5. I supervised the work program on the Goose 1 claim, and prepared this report.

_______Signed______
Peter Holbek, M.Sc., P.Geo.

Certificate of Qualifications

I, Richard J Joyes with a business address of 1700 – 700 West Pender Street, Vancouver, British Columbia, V6C 1G8, do hereby certify that:

1. I am a graduate of The University of Tasmania with a B.Sc. in geology 2000
2. I have practiced my profession continuously since 2000.
3. I am an exploration geologist, for Copper Mountain Mining Corp. having a business address as given above.
4. I assisted in supervising the work program on the Gosse 1 claim, and assisted in preparing this report.

_____Signed_______
Richard J Joyes B.Sc Geo.

Appendix III: Geophysical Report

AND AEROMAGNETIC
GEOPHYSICAL SURVEY

PROJECT: GOOSE 1 Claim

LOCATION: HOUSTON, BRITISH

COLUMBIA FOR: COPPER MOUNTAIN

MINING CORP SURVEY FLOWN:

SEPTEMBER 2016

PROJECT: GL150217

Geotech Ltd.
245 Industrial Parkway North
Aurora, ON Canada L4G 4C4

Tel: +1 905 841 5004
Web: www.geotech.ca
Email: info@geotech.ca

GEOTECH
AIRBORNE GEOPHYSICAL SURVEYS

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EXECUTIVE SUMMARY

Goose 1 Claim

HOUSTON, BRITISH COLUMBIA

On September 22nd to 2016 Geotech Ltd. carried out a helicopter-borne geophysical survey for Copper Mountain Mining Corp over the Goose 1 claim (Area 3 block) situated near Houston, British Columbia.

Principal geophysical sensors included a Z-Axis Tipper electromagnetic (ZTEM) system, and a caesium magnetometer. Ancillary equipment included a GPS navigation system and a radar altimeter. A total of 40 line-kilometres of geophysical data were acquired during the survey.

The survey operations were based out of Houston in British Columbia. In-field data quality assurance and preliminary processing were carried out on a daily basis during the acquisition phase. Preliminary and final data processing, including generation of final digital data and map products were undertaken from the office of Geotech Ltd. in Aurora, Ontario.

The processed survey results are presented as the following maps:

- Total Magnetic Intensity
- Digital Elevation Model
- 3D View of In-Phase Total Divergence versus Skin Depth
- In-Phase Total Divergence (30Hz, 90Hz and 360Hz)
- Tzx In-line In-Phase & Quadrature Profiles over 90Hz Phase Rotated Grid
- Tzy Cross-line In-Phase & Quadrature Profiles over 90Hz Phase Rotated Grid

The survey report describes the procedures for data acquisition, processing, final image presentation and the specifications for the digital data set. 2D inversions over all lines were performed in support of the ZTEM survey results.

1. INTRODUCTION

1.1 GENERAL CONSIDERATIONS

These services are the result of the Agreement made between Geotech Ltd. and Copper Mountain Mining Corp to perform a helicopter-borne geophysical survey over the Area 3 block situated near Houston, British Columbia (Figure 1).

Peter Holbek represented Copper Mountain Mining Corp during the data acquisition and data processing phases of this project.

The geophysical surveys consisted of helicopter borne AFMAG Z-axis Tipper electromagnetic (ZTEM) system and aero magnetics using a caesium magnetometer. A total of 580 line kilometres of geophysical data were acquired during the survey. The survey area is shown in Figure 2.

In a ZTEM survey, a single vertical-dipole air-core receiver coil is flown over the survey area in a grid pattern, similar to regional airborne EM surveys. Two orthogonal, ferrite-core horizontal sensors are placed close to the survey site to measure the horizontal EM reference fields. Data from the three sensors are used to obtain the Tzx and Tzy Tipper (Vozoff, 1972) components at six frequencies in the

30 to 720 Hz band. The ZTEM is useful in mapping geology using resistivity contrasts and magnetometer data provides additional information on geology using magnetic susceptibility contrasts.

Figure 1: Survey location

The crew was based out of Houston, British Columbia for the acquisition phase of the survey. Survey flying was started and completed on September 22nd 2016.

Data quality control and quality assurance, and preliminary data processing were carried out on a daily basis during the acquisition phase of the project. Final reporting, data presentation and archiving were completed from the Aurora office of Geotech Ltd. in October, 2016.

1.2 SURVEY AND SYSTEM SPECIFICATIONS

The survey area of Area 3 is located approximately 28 kilometres southeast of Houston in British Columbia respectively

The survey areas, Goose 1 claim were flown in an southwest to northeast (N 68° E azimuth) direction with traverse line spacing of 200, 300 and 500 metres as depicted in Figure 3, Figure 4 and Figure 5. Tie lines were flown perpendicular to the traverse lines. For more detailed information on the flight spacing and direction see Table 1.

1.3 TOPOGRAPHIC RELIEF AND CULTURAL FEATURES

Topographically, the survey area exhibits a rugged relief with an elevation ranging from 910 to 1468 metres above mean sea level over an area of 40 square kilometres (Figure 3).

There are various rivers and streams running through the survey area which connect various lakes and wetlands. There are visible sign of culture such as roads located through the survey area.

Figure 3: Flight path of Area 3 over a Google Earth Image

2. DATA ACQUISITION

2.1 SURVEY AREA

The survey area (see Figure 3 Appendix A) and general flight specifications are as follows:

Table 1: Survey Specifications

Survey block	Line spacing (m)	Area (Km^2)	Planned[1] Line-km	Actual Line-km	Flight direction	Line numbers
Goose	Traverse: 500	11	40	31.2	N 68° E / N 248° E	L3000 - L3020
	Tie: 5000			10.4	N 158° E / N 338° E	T4000

Survey area boundaries co-ordinates are provided in Appendix B.

2.2 SURVEY OPERATIONS

Survey operations were based out of Houston in British Columbia from September 14th until 22nd 2016. The following table shows the timing of the flying.

Table 2: Survey schedule

Date	Flight #	Flown km	Block	Crew location	Comments
14-Sep-2016				Houston, British Columbia	Crew arrived
15-Sep-2016				Houston, British Columbia	System assembly
16-Sep-2016				Houston, British Columbia	System assembly & testing
17-Sep-2016				Houston, British Columbia	System assembly & testing
18-Sep-2016				Houston, British Columbia	Testing
19-Sep-2016				Houston, British Columbia	No production due to weather
22-Sep-2016	5	40	Goose	Houston, British Columbia	Remaining kms were flown – flying complete

2.3 FLIGHT SPECIFICATIONS

During the survey the helicopter was maintained at a mean altitude of 156 metres above the ground with an average survey speed of 80 km/hour. This allowed for an actual average Receiver loop terrain clearance of 80 metres and a magnetic sensor clearance of 101 metres.

[1] Note: Actual Line kilometres represent the total line kilometres in the final database. These line-km normally exceed the Planned Line-km, as indicated in the survey NAV files.

The on-board operator was responsible for monitoring the system integrity. He also maintained a detailed flight log during the survey, tracking the times of the flight as well as any unusual geophysical or topographic features.

On return of the aircrew to the base camp the survey data was transferred from a compact flash card (PCMCIA) to the data processing computer. The data were then uploaded via ftp to the Geotech office in Aurora for daily quality assurance and quality control by qualified personnel.

2.4 AIRCRAFT AND EQUIPMENT

2.4.1 SURVEY AIRCRAFT

The survey was flown using a Eurocopter Aerospatiale (A-star) 350 B3 helicopter, registration C-GEOC. The helicopter is owned and operated by Geotech Aviation. Installation of the geophysical and ancillary equipment was carried out by a Geotech Ltd crew.

2.4.2 AIRBORNE RECEIVER

The airborne ZTEM receiver coil measures the vertical component (Z) of the EM field. The receiver coil is a Geotech Z-Axis Tipper (ZTEM) loop sensor which is isolated from most vibrations by a patented suspension system and is encased in a fibreglass shell. It is towed from the helicopter using an 85 metre long cable as shown in Figure 6. The cable is also used to transmit the measured EM signals back to the data acquisition system.

The coil has a 7.4 metre diameter with an orientation to the Vertical Dipole. The digitizing rate of the receiver is 2,400 Hz. Attitudinal positioning of the receiver coil is enabled using 3 GPS antennas mounted on the coil. The output sampling rate is 0.4 seconds (see Section 2.4.7)

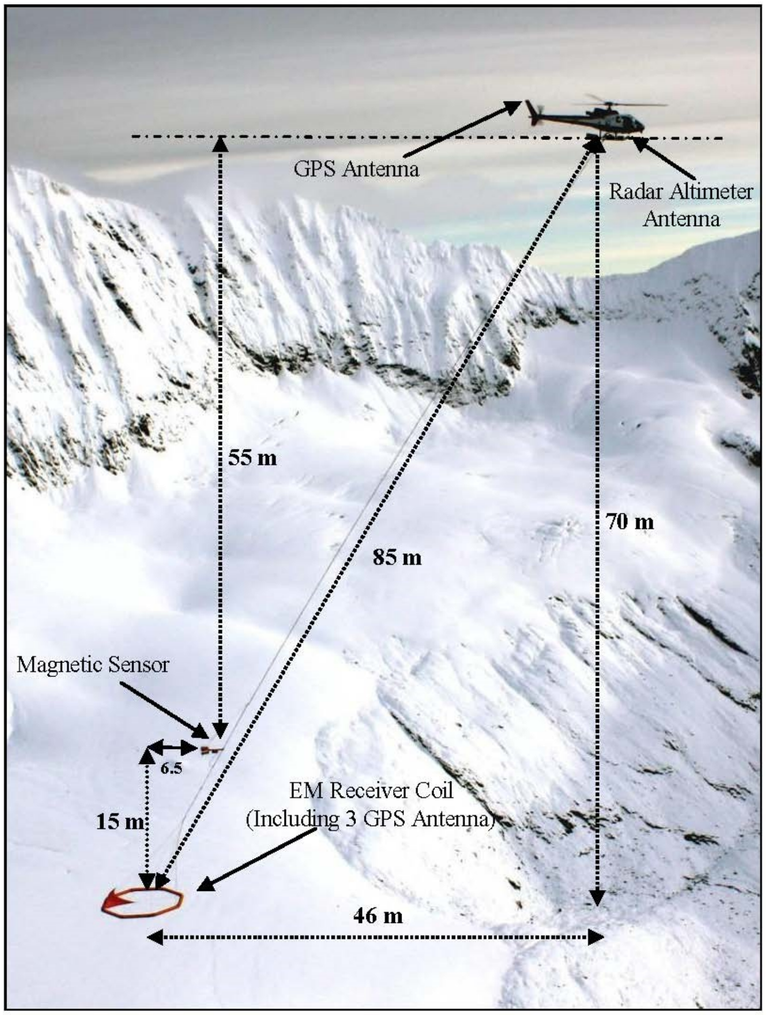

Figure 6: ZTEM™ Configuration

2.4.3 BASE STATION RECEIVER

The two Geotech ZTEM base station sensors measure the orthogonal, horizontal X and Y components of the EM reference field. They are set up perpendicular to each other and roughly oriented according to the flight line direction. The orientation of both units is not critical as the horizontal field can be further decomposed into the two orientations of the survey flight. The orientation of the base stations were measured using a compass.

The compact base station sensors have a length of 2.31m and diameter of 0.27m with a suspended ferrite core, as shown in Figure 7.

The base station receiver for the block was installed in a gravel pit (126° 55.8357' W, 54° 16.40682' N). The azimuth of the reference sensor was N218°E, (named as A) and for the orthogonal component it was N306°E, (named as B). Angles A and B are taken into account together with the survey lines azimuth to calculate the in-line (Tzx) and cross-line (Tzy) field utilizing a proprietary software.

Figure 7: ZTEM base station receiver sensor.

2.4.4 AIRBORNE MAGNETOMETER

The magnetic sensor utilized for the survey was a Geometrics split-beam optically pumped caesium vapour magnetic field sensor, mounted in a separate bird, and towed on a cable at a mean distance of 55 metres below the helicopter (Figure 6). The sensitivity of the magnetic sensor is 0.02 nanoTesla (nT) at a sampling interval of 0.1 seconds. The magnetometer will perform continuously in areas of high magnetic gradient with the ambient range of the sensor approximately 20k-100k nT. The Aerodynamic magnetometer noise is specified to be less than 0.5 nT. The magnetometer sends the measured magnetic field strength as nanoTesla to the data acquisition system via the RS-232 port.

2.4.5 RADAR ALTIMETER

A Terra TRA 3000/TRI 40 radar altimeter was used to record terrain clearance. The antenna was mounted beneath the bubble of the helicopter cockpit (Figure 6).

2.4.6 GPS NAVIGATION SYSTEM

The navigation system used was a Geotech PC104 based navigation system utilizing a NovAtel's WAAS(Wide Area Augmentation System) enable OEM4-G2-3151W GPS receiver, Geotech navigate software, a full screen display with controls in front of the pilot to direct the flight and an NovAtel GPS antenna mounted on the helicopter tail (Figure 6). As many as 11 GPS and two WAAS satellites may be monitored at any one time. The positional accuracy or circular error probability (CEP) is 1.8 m, with WAAS active, it is 1.0 m. The co-ordinates of the block were set-up prior to the survey and the information was fed into the airborne navigation system.

2.4.7 DIGITAL ACQUISITION SYSTEM

The power supply and the data acquisition system are mounted on an equipment rack which is installed into the helicopter. Signal and power wires are run through the helicopter to connect on to the tow cable outside. The tow cable supports the ZTEM and magnetometer birds during flight via a safety shear pin connected to the helicopter hook. The major power and data cables have a quick disconnect safety feature as well. The installation was undertaken by the Geotech Ltd. crew and was certified before surveying.

A Geotech data acquisition system recorded the digital survey data on an internal compact flash card. Data is displayed on an LCD screen as traces to allow the operator to monitor the integrity of the system. The data type and sampling interval as provided in Table 3.

Table 3: Acquisition and Processing Sampling Rates

DATA TYPE	ACQUISITION SAMPLING	PROCESSING SAMPLING
ZTEM Receiver	0.000416 sec	0.4 sec
Magnetometer	0.1 sec	0.4 sec
GPS Position	0.2 sec	0.4 sec
Radar Altimeter	0.2 sec	0.4 sec
ZTEM Base station	0.000416 sec	– –

2.5 MAG BASE STATION

A combined magnetometer/GPS base station was utilized on this project. A Geometrics Caesium split- beam vapour magnetometer was used as a magnetic sensor with a sensitivity of 0.001 nT. The base station was recording the magnetic field together with the GPS time at 1 Hz on a base station computer.

The base station magnetometer sensor for the survey was installed at an open field on airport property (126° 46.4991' W, 54° 26.1921' N) away from electric transmission lines and moving ferrous objects such as motor vehicles. The base station data were backed-up to the data processing computer at the end of each survey day.

3. PERSONNEL

The following Geotech Ltd. personnel were involved in the project. FIELD:

Project Manager:	Adrian Sarmasag (Office)
Data QC:	Nick Venter (Office)
Crew chief:	Brian Youngs
Operator:	Tunde Bello

The survey pilot and the mechanical engineer were employed directly by the helicopter operator – Geotech Aviation.

Pilot:	Andre Vandrei
	Rob Girard
Mechanical Engineer:	n/a

OFFICE:

Preliminary Data Processing:	Nick Venter
Final Data Processing:	Ali Latrous
Final Data QA/QC:	Geoffrey Plastow
Reporting/Mapping:	Liz Mathew

Data acquisition phase was carried out under the supervision of Andrei Bagrianski, P. Geo, and Chief Operating Officer. Processing and Interpretation phases were carried out under the supervision of Geoffrey Plastow, P. Geo, Data Processing Manager. The customer relations were looked after by David Hitz.

4. DATA PROCESSING AND PRESENTATION

Data compilation and processing were carried out by the application of Geosoft OASIS Montaj and programs proprietary to Geotech Ltd.

4.1 FLIGHT PATH

The flight path, recorded by the acquisition program as WGS 84 latitude/longitude, was converted into the WGS84 Datum, UTM Zone 9 North coordinate system in Oasis Montaj.

The flight path was drawn using linear interpolation between x, y positions from the navigation system. Positions are updated every second and expressed as UTM easting's (x) and UTM northing's (y).

4.2 IN-FIELD PROCESSING AND QUALITY CONTROL

In-Field data processing and quality control are done on a flight by flight basis by a qualified data processor (see Section 3.0). Processing steps and check-up procedures are designed to assure the best possible final quality of ZTEM survey data. A general overview of those steps is presented in the following paragraphs.

The In-Field quality control can be separated into several phases:

a. GPS Processing Phase: GPS Data are first examined and evaluated during the GrafMov processing.

b. Raw data, ZTEM viewer phase:

   Data can be viewed, examined for consistency, individual channel spectra examined and overall noise estimated in the viewer provided by the ZTEM proprietary software, on the raw flight data and raw base station data separately, on the merged data, and finally on the data that have undergone ZTEM processing.

c. Field Geosoft phase:

   Magnetic data, Radar altimeter data, GPS positioning data are re-examined and processed in this phase. Prior to splitting the lines EM data are examined flight by flight and the effectiveness of applying the attitude correction evaluated. After splitting the lines, a set of grids are generated for each parameter and their consistency evaluated. Data profiles are also re-evaluated on a line to line basis. A power line monitor channel is available in order to identify power line noise.

4.3 GPS PROCESSING

Three GPS sensor (mounted on the airborne receiving loop) measurements were differentially corrected using the Waypoint GrafMov™ software in order to yield attitude corrections to recorded EM data.

4.4 ZTEM ELECTROMAGNETIC DATA

The ZTEM data were processed using proprietary software. Processing steps consist of the following preliminary and final processing steps:

4.4.1 PRELIMINARY PROCESSING

a. Airborne EM, Mag, radar altimeter and GPS data are first merged with EM base station data into one file.
b. Merged data are viewed and examined for consistency in an incorporated viewer
c. In the next, processing phase, the following entities are taken into account:
    - the Base station sensor orientation with respect to the Magnetic North,
    - the Local declination of the magnetic field,
    - Suggested direction of the X coordinate (North or line direction),
    - Sensitivity coefficient that compensates for the difference in geometry between the base station and airborne coils.
    - Rejection filters for the 50 Hz and helicopter generated frequencies.
d. Six frequencies (30, 45, 90, 180, 360, and 720 Hz) are extracted from the airborne EM time- series sensor response using windows of 0.4 seconds and the base station coils using windows of 1.0 seconds.
e. The real (In-Phase) and imaginary (Quadrature) parts of the tipper transfer functions are derived from the In-line (X or Tzx) and Cross-line (Y or Tzy) components.
f. Such processed EM data are then merged with the GPS data, magnetic base station data and exported into a Geosoft xyz file.

4.4.2 GEOSOFT PROCESSING

Next stage of the preliminary data processing is done in a Geosoft TM environment, using the following steps:

a. Import the output xyz file from the AFMAG processing, as well as the base Mag data into one database.
b. Split lines according to the recorded line channel,
c. GPS processing, flight path recovery (correcting, filtering, calculating Bird GPS coordinates, line splitting)
d. Radar altimeter processing, yielding the altitude values in metres.
e. Magnetic spike removal, filtering (applied to both airborne and base station data). Calculation of a base station corrected mag.
f. Apply preliminary attitude corrections to EM data (In phase and Quadrature), filter and make preliminary grids and profiles of all channels.

4.4.3 FINAL PROCESSING

Final data processing and quality control were undertaken by Geotech Ltd headquarters in Aurora, Ontario by qualified senior data processing personnel.

A quality control step consisted of re-examining all data in order to validate the preliminary data processing and to allow for final adjustments to the data.

Attitude corrections were re-evaluated, and re-applied, on component by component, flight by flight, and frequency by frequency bases. Any remaining line to line system noise was removed by applying a mild additional levelling correction.

4.4.4 ZTEM PROFILE SIGN CONVENTION

Tzx and Tzy tipper components do not exhibit maxima or minima above conductors, resistors or at contacts; in fact they produce cross-over type anomalies (Ward, 1959; Vozoff, 1972; Labson, 1985). The sign of the cross-over (positive-to-negative or neg-to-pos) or its polarity (normal or reversed) depends on the line direction and follows a well-defined convention. The crossover polarity sign convention for ZTEM is according to the right hand Cartesian rule (Z positive – up) that is commonly used for multi- component transient electromagnetic methods.

For the Area 3 block, southwest to northeast tie-lines the In-phase Tzx in-line component crossover is positive-negative pointing N68° for tabular conductors' perpendicular to the profile (Figure 8 - right). The corresponding Tzy component in-phase cross-over polarity is positive-negative pointing N338˚ (90 degrees counter clockwise to Tzx) according to the right hand Cartesian rule.

Conversely, tabular resistive bodies produce In-Phase cross-overs for the In-line Tzx and Cross-line Tzy components that are opposite in sign to conductors, i.e., negative to positive cross-overs.

On the other hand, the Quadrature part of the tipper transfer function can produce cross-overs in Tzx and Tzy that are of either polarity over a conductor or resistor. For this reason, the ZTEM profile sign convention only applies to the In-phase part of the tipper response. A brief discussion of ZTEM and AFMAG, along with selected forward model responses is presented in Appendix D.

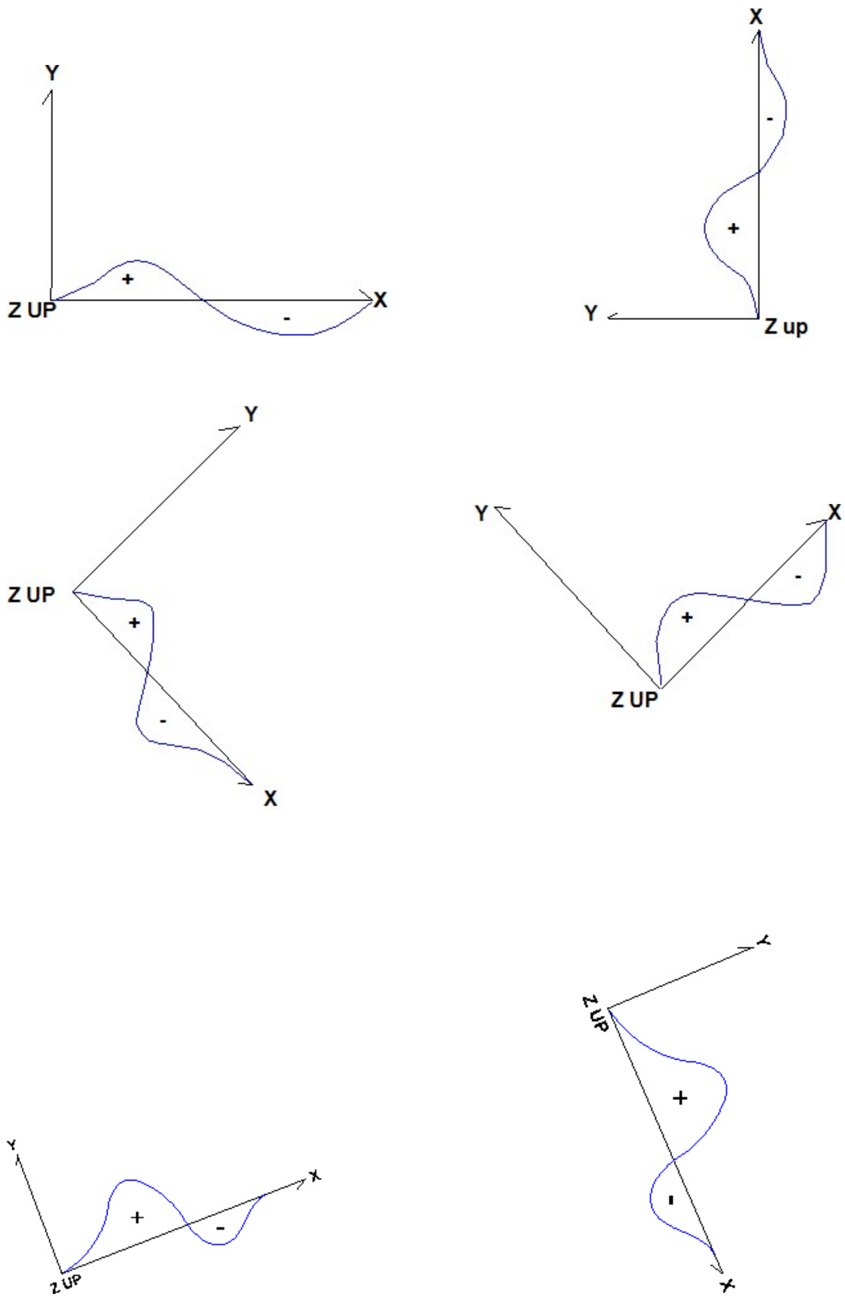

Figure 8: ZTEM Crossover Polarity Convention for Tzx and Tzy for survey line (left) and tie-lines (right) – Fenton, Topshelf Eastshelf and Area 3.

4.4.5 ZTEM Quadrature Sign Dependence

One important note regarding the sign of the ZTEM Quadrature, relative to the In-Phase component, particularly with regards to computer modeling and inversion.

The sign of the magnetotelluric Quadrature relative to the In-Phase tipper transfer function component pertains to the Fourier transformation of the time series to give frequency domain spectra. There are two widely used conventions for time dependence in the transformations, **exp(+iωt)** and **exp(-iωt).** That which is implemented largely is a matter of personal preference and precedent. The importance of the In- Phase and Quadrature sign convention is not critical, provided that it is known and documented.

In ZTEM, the data processing code used for the Fourier transformation the time-series data to frequency domain spectra adopts a **exp(-iωt)** time dependence (J. Dodds, Geo Equipment Manufacturing, pers. comm., Nov-2009). Whereas in the forward modeling and inversion program Zvert2d, the sign of the Quadrature relative to the In-Phase transfer function assumes an **exp(+iωt)** dependence[2].

As a result, for users interested in computer modeling and inversion of ZTEM data, the sign of the Quadrature will need to be reversed, relative to the In-Phase component, in order to provide a proper result (Figure 9). Indeed this reverse Quadrature polarity convention is assumed in all forward modeling and inversion of ZTEM data, as described in Figures 5-7 in Appendix D.

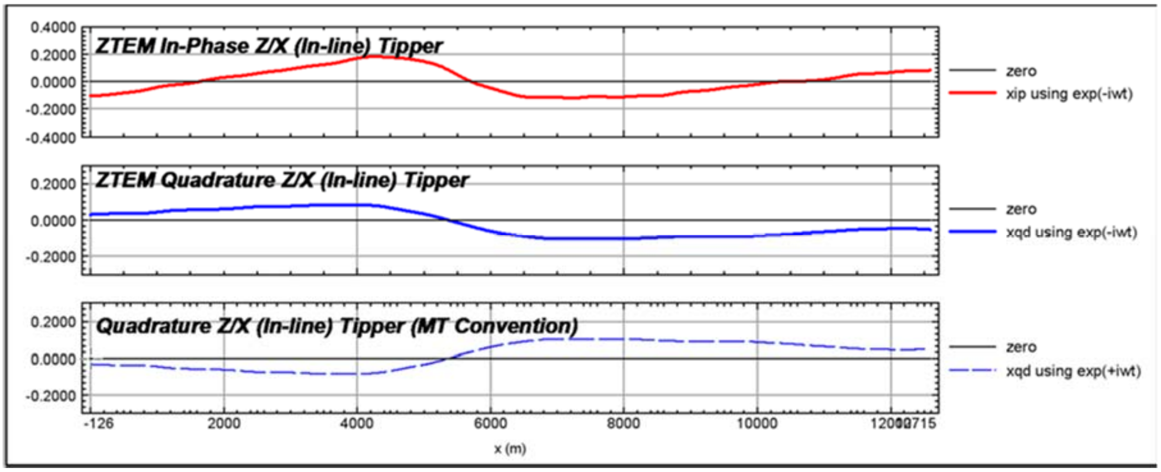

Figure 9: Illustration of ZTEM In-Phase & Quadrature Tipper transfer function polarity convention (e-iωt) relative to equivalent MT Tipper Quadrature polarity convention (e+iωt) for a graphitic conductor in Athabasca Basin, SK.

4.4.6 TOTAL DIVERGENCEAND PHASE ROTATION PROCESSING

In a final processing step DT (Total Divergence) and PR (Phase Rotation) processing are applied to the multi-frequency In-phase and Quadrature ZTEM data. This is due to the crossover nature of the Tipper Responses; these additional processing steps are applied to convert them into local maxima for easier interpretation.

To present the data from both tipper components into one image, the Total Divergence parameter, termed the DT is calculated from the horizontal derivatives of the Tzx and Tzy tippers (Lo and Zang, 2008). It is analogous to the "Peaker" parameter in VLF (Pedersen, 1998).

Total Divergence DT: ***DT = DIV (Tzx, Tzy)= d(Tzx)/dx+d(Tzy)/dy***

This DT parameter was introduced by Petr Kuzmin (Milicevic, 2007, p. 13) and is derived for each of the In Phase and Quadrature components at individual frequencies. These in turn allow for minima over conductors and maxima over resistive zones. DT grids for each of the extracted frequencies were generated accordingly, using a reverse colour scheme with warm colours over conductors and cool colours over resistors.

[2] Phillip E. Wannamaker (2009): Two-dimensional Inversion of ZTEM data: Synthetic Model Study and Test Profile Images, Internal Geotech technical report by Emblem Exploration Services Inc., January 22, 2009, 32 pp.

The DT gives a clearer image of conductor's location and shape but, as a derivative, it does not preserve some of the long wavelength information and is also sensitive to noise.

As an alternative, a 90 degree Phase Rotation (PR) technique is also applied to the grids of each individual component (Tzx and Tzy). It transforms bipolar (cross over) anomalies into single pole anomalies with a maximum over conductors, while preserving long wavelength information (Lo et al., 2009). The two orthogonal grids are then usually added to obtain a Total Phase Rotated (TPR) grid for the In-Phase and Quadrature.

Total Phase-Rotation TPR:	***= PR (Tzx) + PR (Tzy)***

A presentation of the ZTEM test survey results over unconformity uranium deposits that illustrates DT and TPR examples, as documented by Lo et al. (2009) is provided in Appendix E.

4.4.7 2D EM Inversion

2d inversions of the ZTEM results were performed over selected lines using the Geotech Av2dtopo software developed by Phil Wannamaker, U. of Utah, for Geotech Ltd. The inversion algorithm is based on the 2D inversion code with Jacobians of de Lugao and Wannamaker (1996), the 2D forward code of Wannamaker et al (1987), and the Gauss-Newton parameter step equations of Tarantola (1987). Av2dtopo has been developed /modified for use with our ZTEM platform by taking into account the ground topography and the air-layer between the receiver bird and the ground surface. It also implements a depth-of-investigation (DOI) index, using the 1.5x MT maximum skin depth and integrated 1D conductance method of Spies (1989). This is shown using a dashed DOI line and opaque coloring in the 2d inversion section of Appendix F.

The 2D code only considers the In-Line (Tzx) data and assumes that the strike lengths of bodies are infinite and orthogonal to the profile. The code is designed to account for the ZTEM vertical coil receiver and fixed base station reference measurements. The inversion uses a model-mesh consisting of 440 cells laterally and 112 cells vertically. Typically the ZTEM data are de-sampled to 192 pts, in order to allow the inversion to run in 20 minutes or less. Typically, between 1-2% errors are added to the In-line in-phase (XIP) and Quadrature (XQD) data obtained at 30,45,90,180,360 & 720Hz. Errors are adjusted until numerical convergence (<1.0 rms) is attained in 5 iterations or less. All inversions are based on an apriori homogeneous starting half-space model, usually between 100 – 1000ohm metres, as determined by the interpreter, based on model testing, as described in Appendix F.

4.5 MAGNETIC DATA

The processing of the total magnetic field intensity (TMI) data involved the correction for diurnal variations by using the digitally recorded ground base station magnetic values. The base station magnetometer data was edited and merged into the Geosoft GDB database on a daily basis. The aeromagnetic data was corrected for diurnal variations by subtracting the observed magnetic base station deviations.

Tie line levelling was carried out by adjusting intersection points along traverse lines. A micro-levelling procedure was applied to remove persistent low-amplitude components of flight-line noise remaining in the data.

The corrected magnetic data was interpolated between survey lines using a random point gridding method to yield x-y grid values for a standard grid cell size of 75 metres (Fenton and Topshelf Eastshelf block) and 125 metres (Area 3 block). The Minimum Curvature algorithm was used to interpolate values onto a rectangular regular spaced grid.

5. CONCLUSIONS AND RECOMMENDATIONS

A helicopter -borne ZTEM and aeromagnetic geophysical survey has been completed over the Goose 1 claim block situated near Houston, British Columbia.

The total area coverage is 11 km ^{2}. Total survey line coverage is 40 line kilometres. The principal sensors included a Z-Axis Tipper electromagnetic (ZTEM) system and a caesium magnetometer. Results have been presented as stacked profiles and contour colour images at a scale of 1:20,000.

There is no summary interpretation included in this report; however, 20 inversions were performed in support of the ZTEM survey results.

Based on the geophysical results obtained, a number of interesting conductive structures were identified across the property. The magnetic results also contain worthwhile information in support of exploration targets of interest. We therefore recommend a more detailed interpretation of the available geophysical data, including 30 ZTEM and 30 Magnetic inversions and ground follow-up, in conjunction with the geology, prior to ground follow up and drill testing.

Respectfully submitted,

Nick Venter

Geotech Ltd.

Ali Latrous

Geotech Ltd.

Data Processing Manager

Geotech Ltd.

c.Y

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o, PRACTISING MEMBER

October, 2016

[3] Final data processing of the EM and magnetic data were carried out by Ali Latrous. 2D Inver sions by Ali Latrous from the office of Geotech Ltd. in Aurora, Ontario, under the supervision of Geoffrey Plastow, Data Processing Manager.

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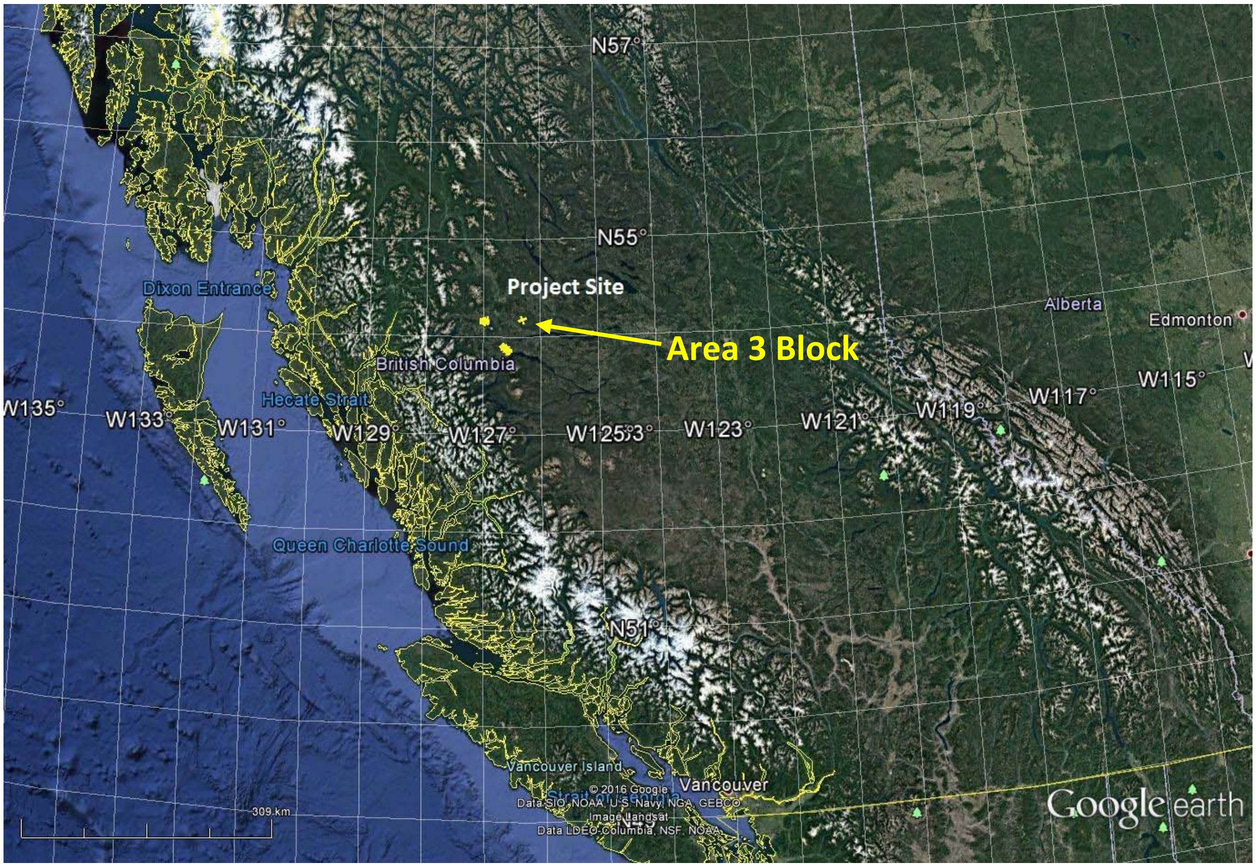
APPENDIX A

SURVEY AREA LOCATION MAP



Overview of the Survey Area

APPENDIX B

SURVEY AREA COORDINATES

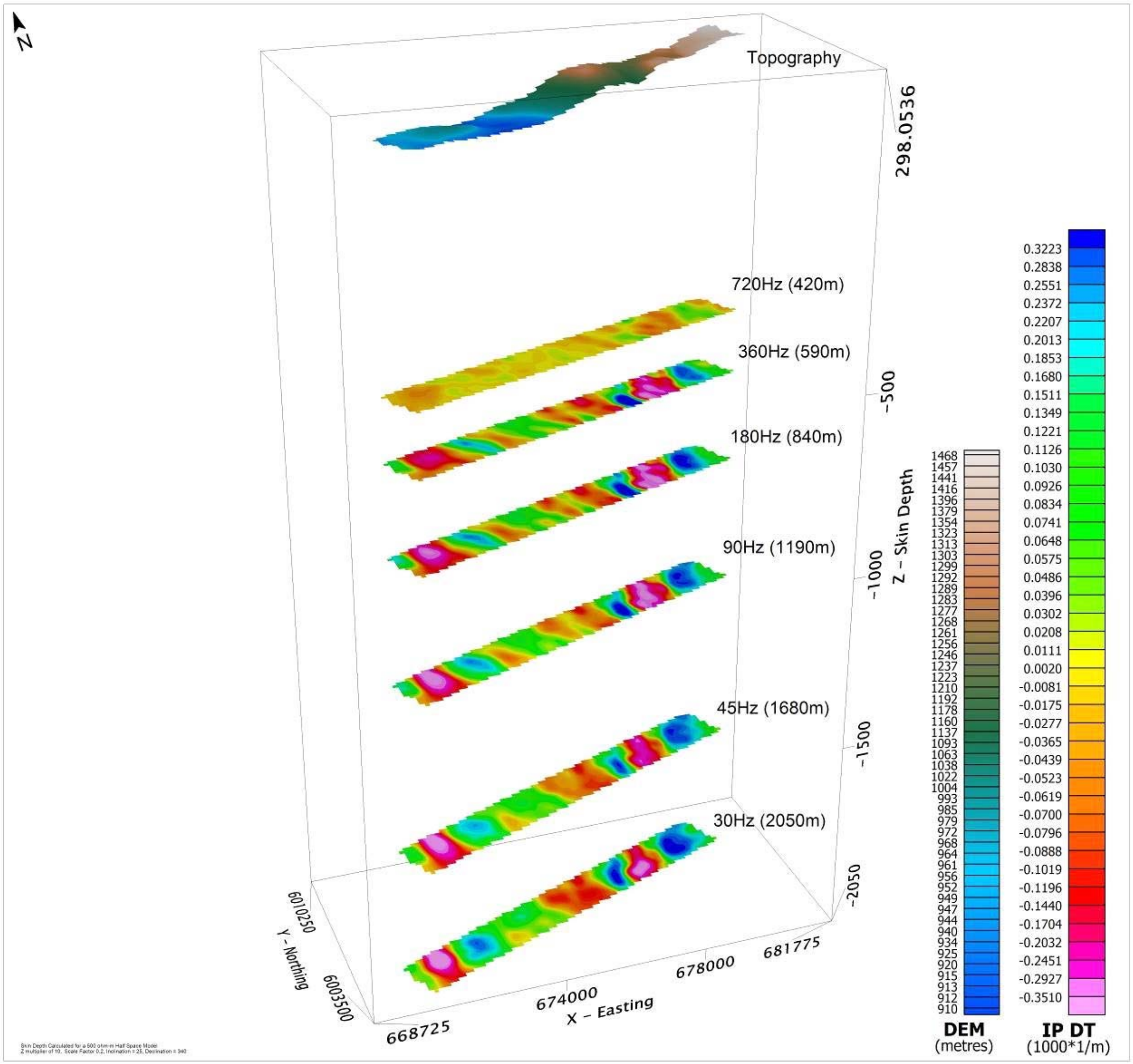
(WGS 84, UTM Zone 9 North)

Area 3

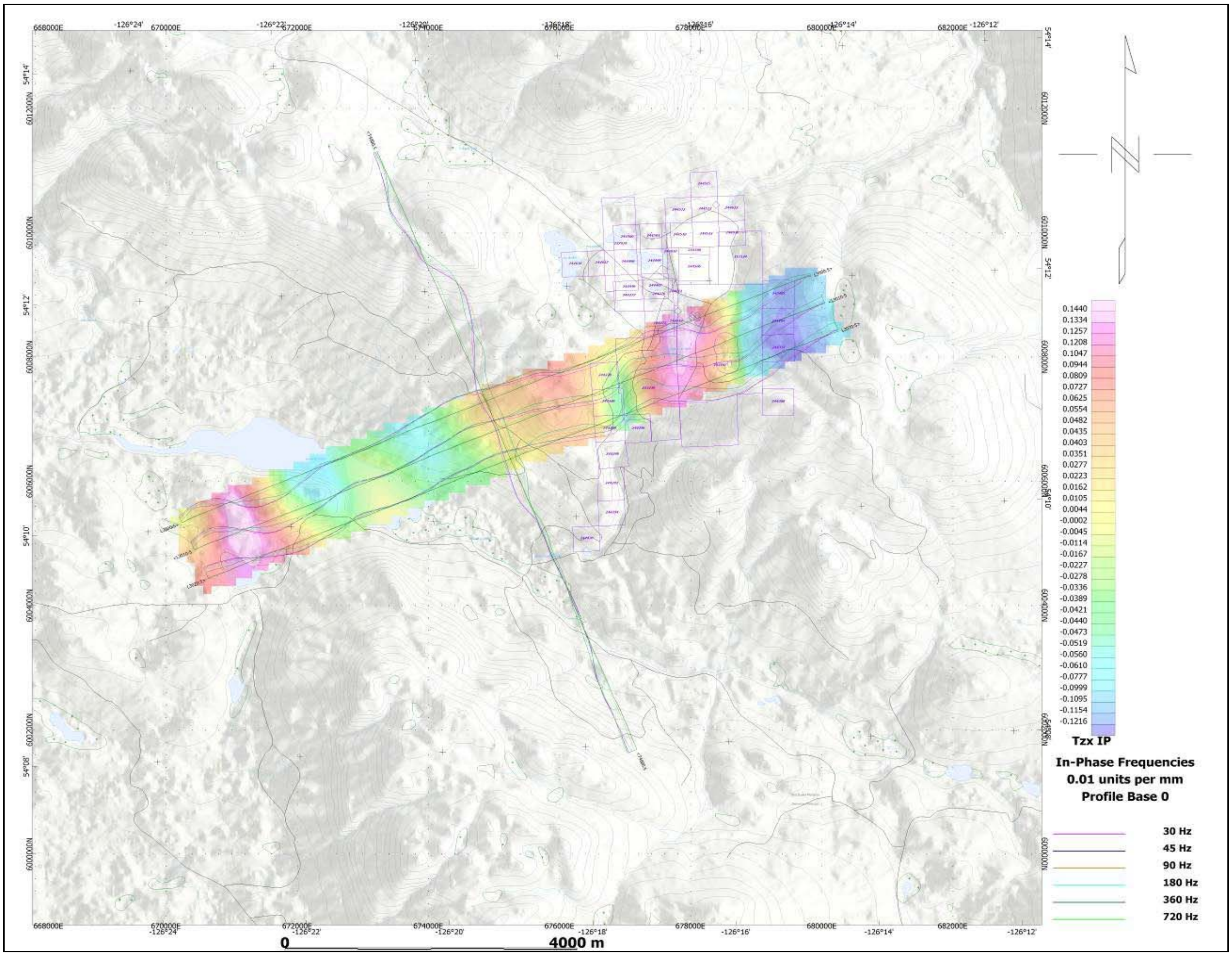
X	Y
679600	6009225
670460	6005460
670910	6004390
680080	6008250

APPENDIX C

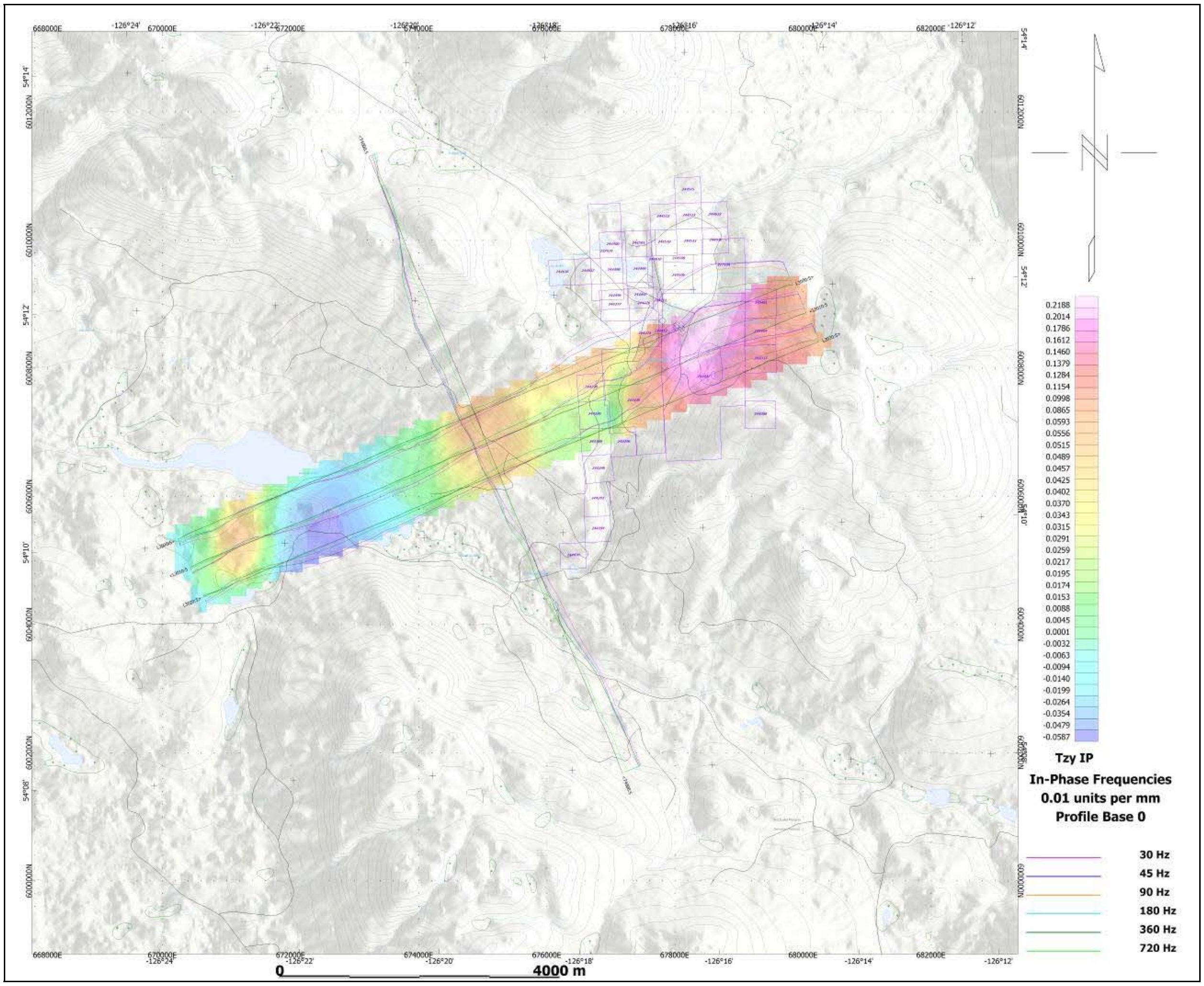
GEOPHYSICAL MAPS[1]



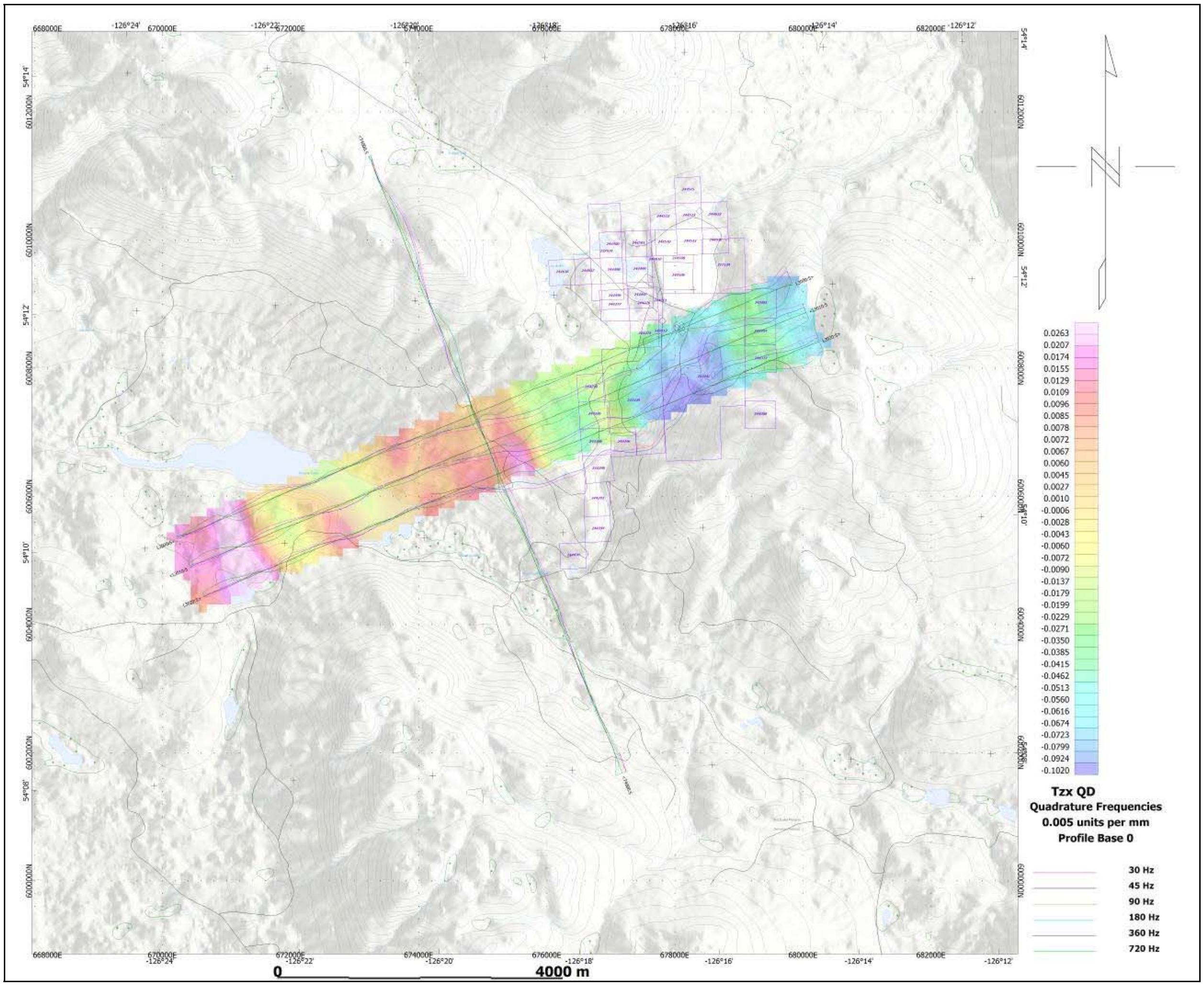
Area 3 - 3D View of In-Phase, Total Divergence (DT) grids versus Skin Depth (30 Hz - 720 Hz)



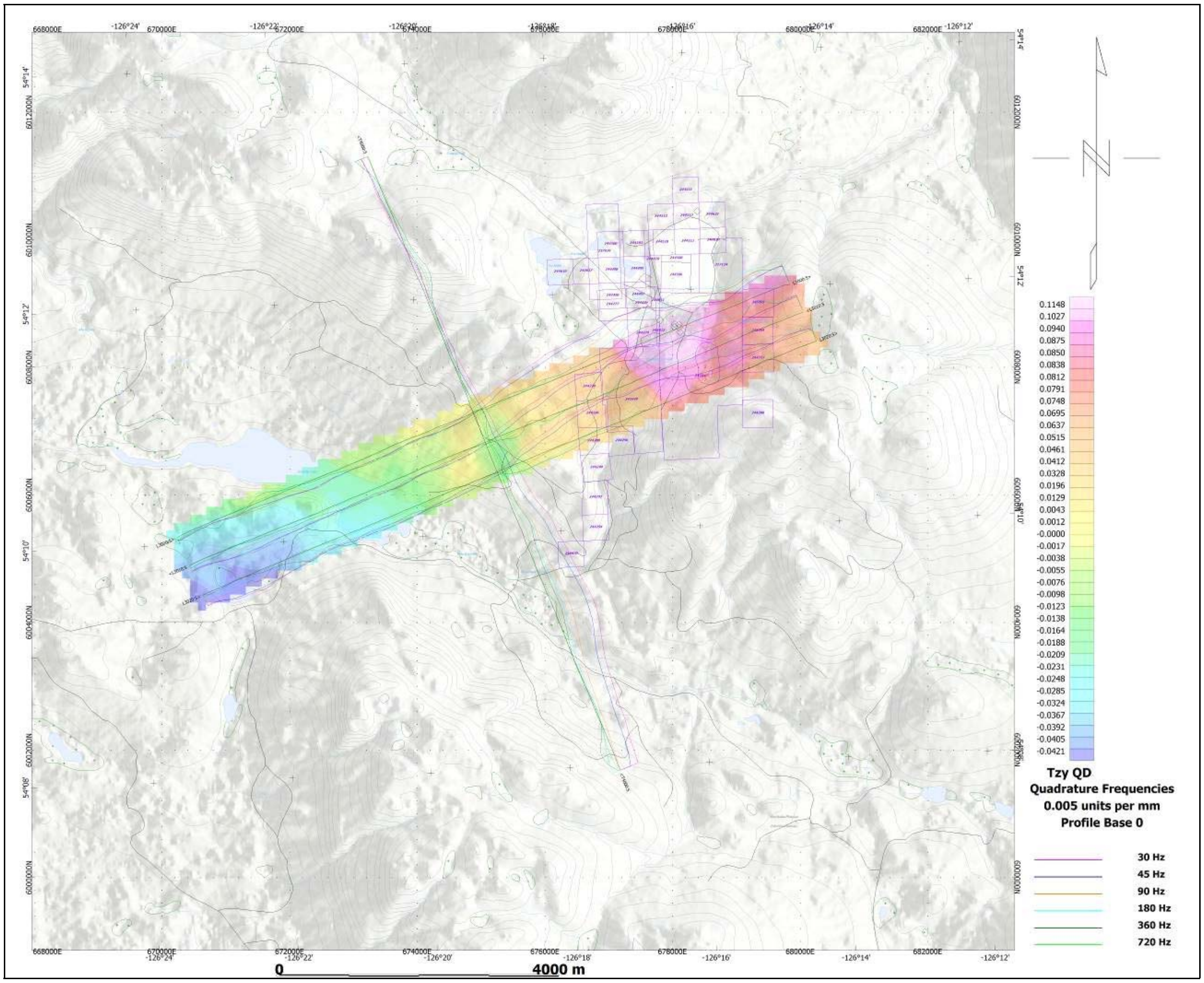
Area 3 - Tzx (In-line) In-Phase Profiles over 90Hz Rotated Tzx In-Phase Grid



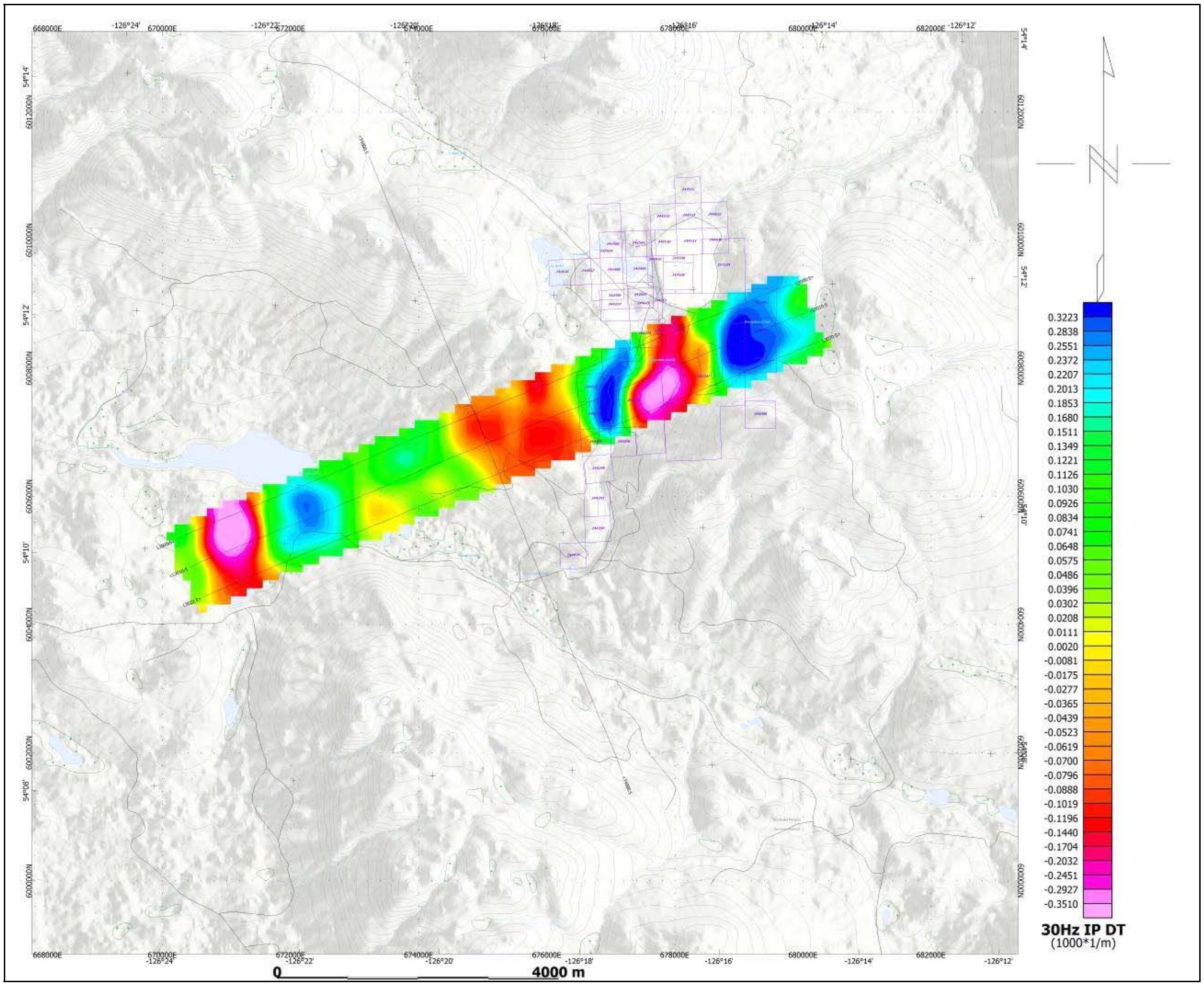
Area 3 - Tzy (Cross-line) In-Phase Profiles over 90Hz Rotated Tzy In-Phase Grid



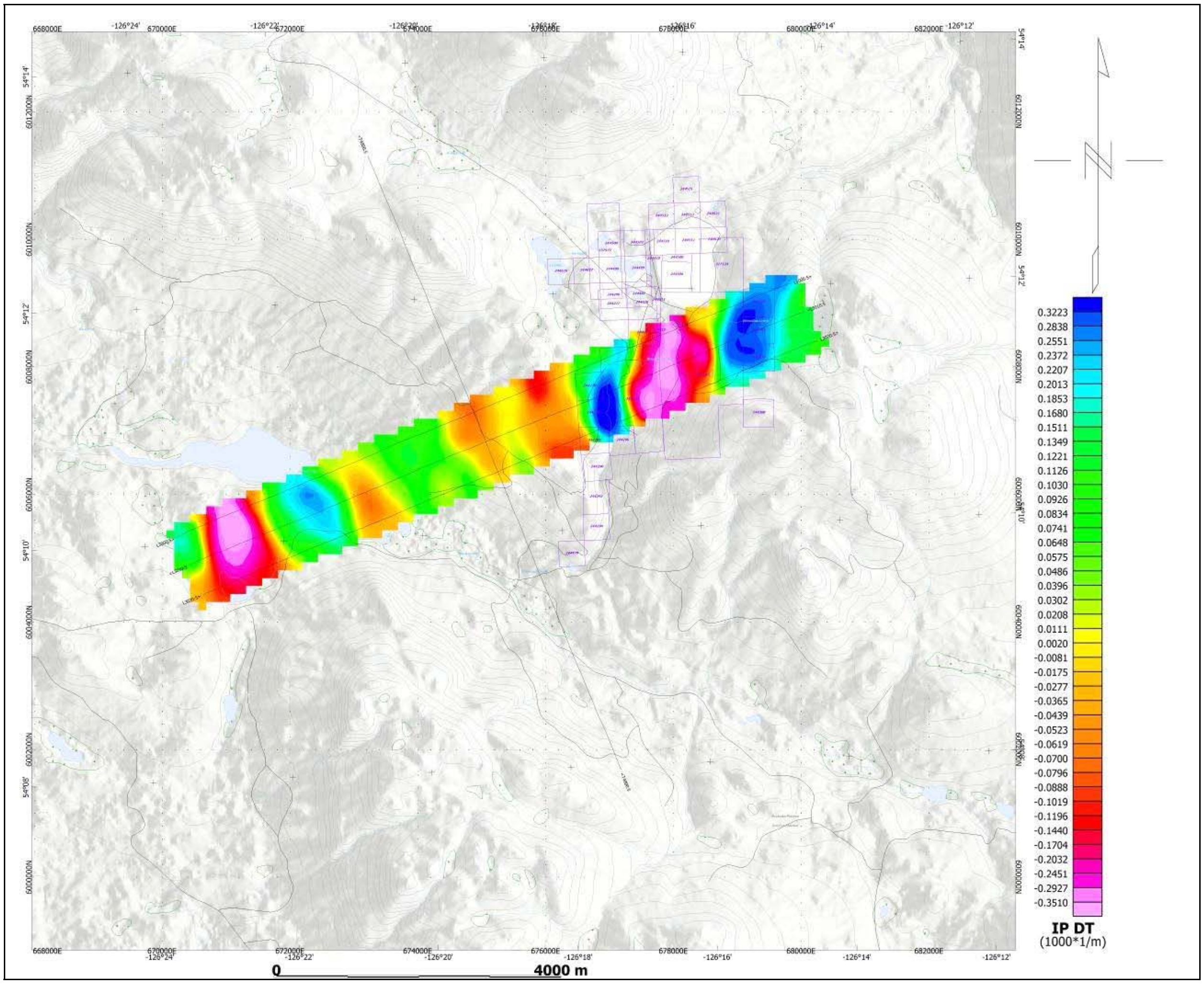
Area 3 - Tzx (In-line) Quadrature Profiles over 90Hz Rotated Tzx Quadrature Grid



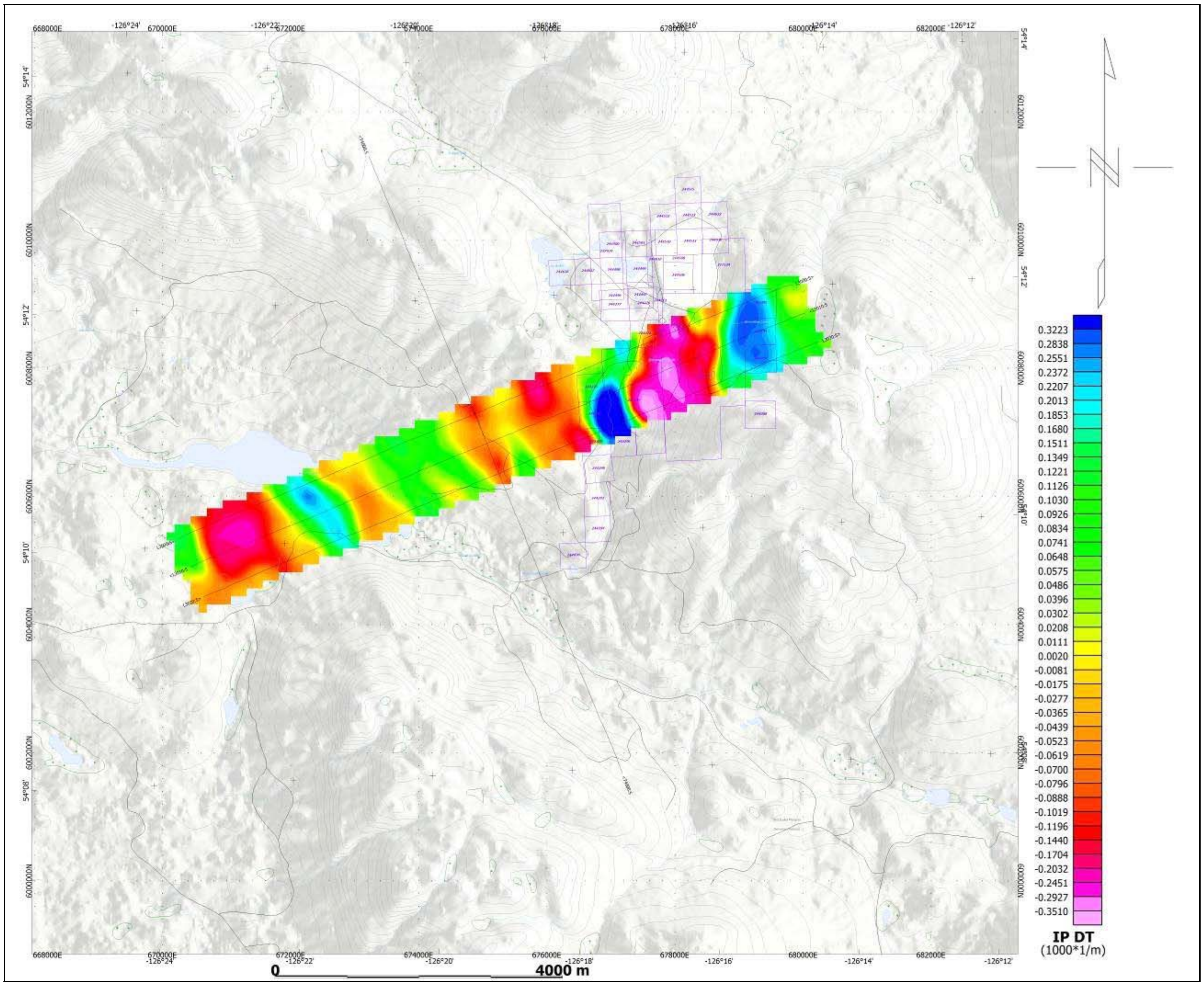
Area 3 - Tzy (Cross-line) Quadrature Profiles over 90Hz Rotated Tzy Quadrature Grid



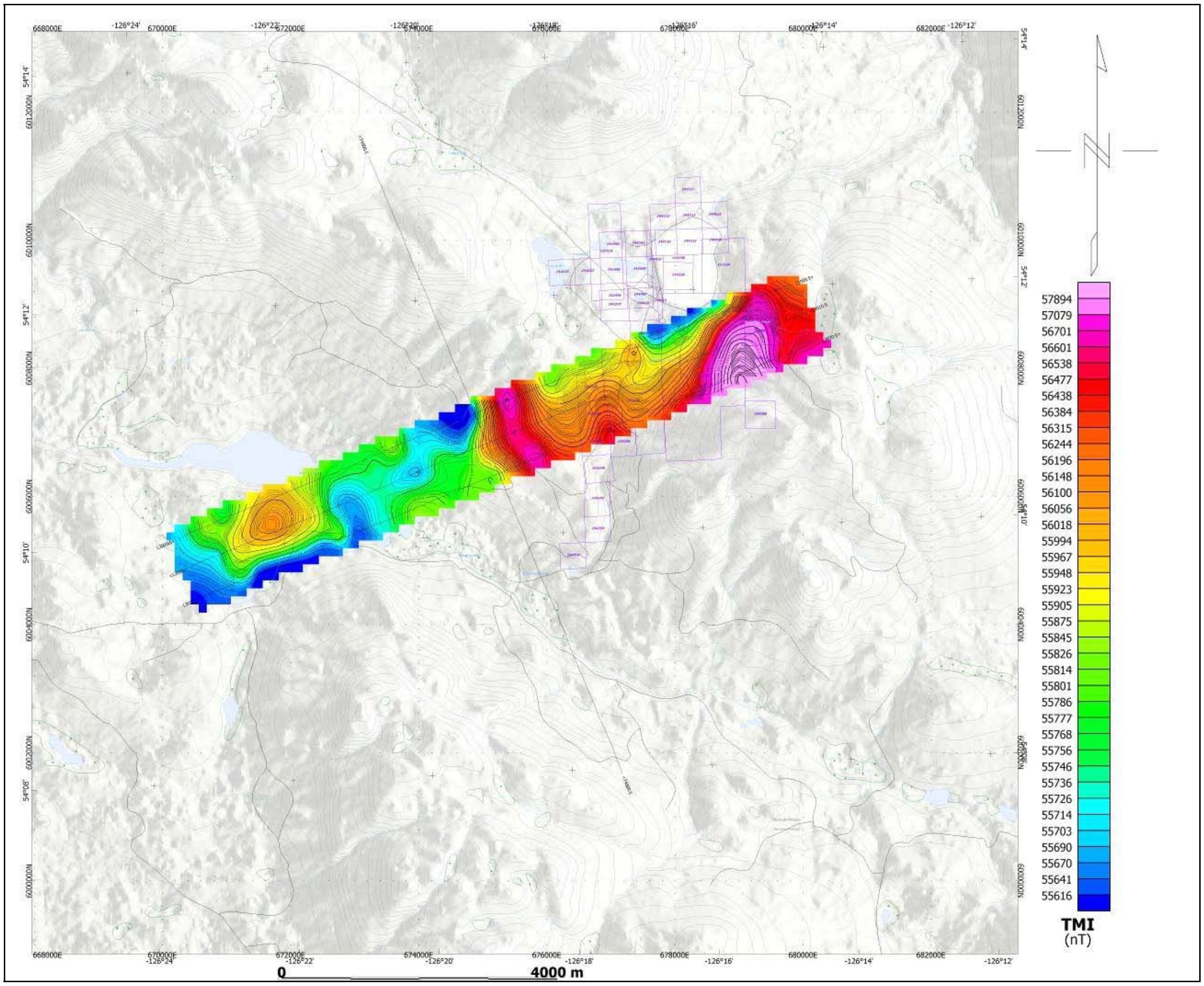
Area 3 - 30Hz Total Divergence In-Phase (DT) Grid



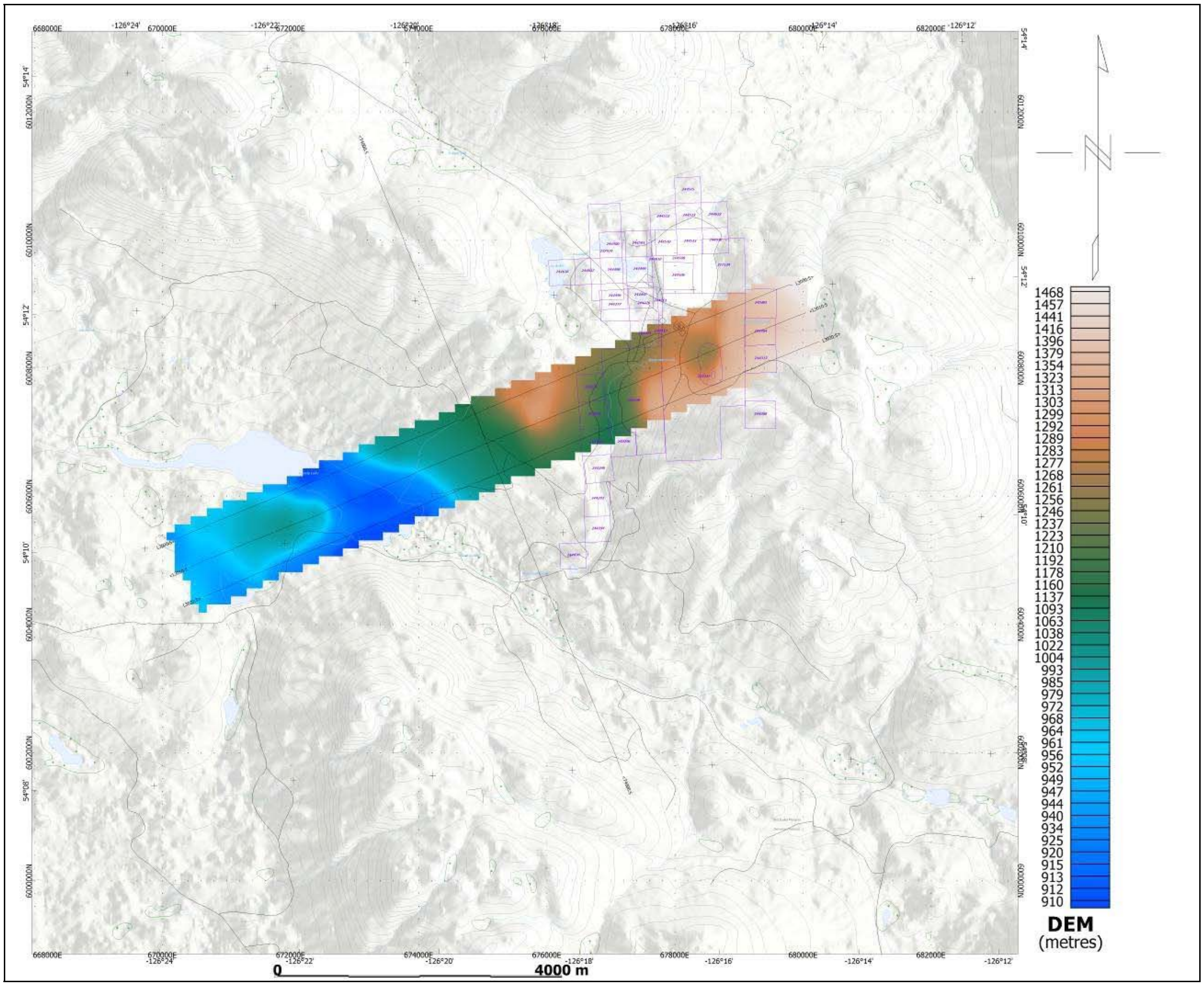
Area 3 - 90Hz Total Divergence In-Phase (DT) Grid



Area 3 - 360Hz Total Divergence In-Phase (DT) Grid



Area 3 - Total Magnetic Intensity (TMI)



Area 3 - Digital Elevation Model (DEM)

APPENDIX D

ZTEM THEORETICAL CONSIDERATIONS

A brief section on the theory behind the AFMAG technique is provided for completeness and a more comprehensive development of the theory can be found in standard texts. The natural EM field is normally horizontally polarized. Subsurface lateral variations of conductivity generate a vertical component, which is linearly related to the horizontal field. Although the fields look like random signals, they may be treated as the sum of sinusoids. At each frequency the field can be expressed as a complex number with magnitude and argument equal to the amplitude and phase of the sinusoid. The relation between the field components can then be expressed by a linear complex equation with two complex coefficients at any one frequency. These coefficients are dependent upon the subsurface and not upon the horizontal field present at any particular time and are appropriate parameters to measure (Vozoff, 1972).

$$Hz(f) = Tx(f)\, Hx(f) + Ty(f)\, Hy(f), \quad (1)$$

Where

Hx(f), Hy(f) and Hz(f) are x, y and z components of the field, Tx(f) and

Ty(f) are the "tipper" coefficients.

In the case of a horizontally homogeneous environment, Tx and Ty are equal to zero because Hz =0. They show certain anomalies only by the presence of changes in subsurface conductivity in the horizontal direction. The real parts of the coefficients correspond to tangents of tilt angles measured with a controlled source. The complex tensor [Tx, Ty] known as the "tipper" defines the vertical response to horizontal fields in the x and y directions respectively.

Tx and Ty are two unknown coefficients in one equation, and we therefore must combine two or more sets of measurements to solve them. To reduce effects of noise, multiple sets of measurements can be made, and the coefficients, which minimize the squared error in predicting the measured Z from X and Y, can be found. This leads to next formulas for estimating the coefficients.

$$Tx = ([HzHx^*]\,[HyHy^*] - [HzHy^*]\,[HyHx^*]) \,/\, ([HxHx^*]\,[HyHy^*] - [HxHy^*]\,[HyHx^*]), \quad (2)$$

and

$$Ty = ([HzHy^*]\,[HxHx^*] - [HzHx^*]\,[HxHy^*]) \,/\, ([HxHx^*]\,[HyHy^*] - [HxHy^*]\,[HyHx^*]. \quad (3)$$

Where

[HxHy*] (For example) denotes a sum of the product of Hx with the complex conjugate of Hy.

In practical processing algorithms, all numbers Hx, Hy and Hz can be obtained by applying the same digital band-pass filters to three incoming parallel data signals. FFT algorithms are also applicable. All sums like [HxHy*] can be calculated on the basis of a discrete time interval in the range from 0.1 to 1 sec or on a sliding time base.

Using platform attitude data in the EM data processing can be done at different stages of the signal processing. The most obvious idea is to transform parallel data from local coordinates of the platform into absolute geographical coordinates before the main signal processing procedure. Unfortunately, the proper algorithms of attitude data obtained, often require some post-processing algorithms such as using post-calculated accelerations based on GPS data etc. That is why it is preferable to treat x-y-z coordinates in formulas above in the local coordinate system of the platform and to recalculate resulting local tilt angles into a geographical or global coordinate system later, during the data post processing.

In weak field conditions where the level of the signal is comparable with input noise levels in preamplifiers, the bias in the estimated values of Tx and Ty caused by noise in the horizontal signals become substantial and cannot be reduced by any averaging. This bias can be removed by the use of separate reference signals containing noise uncorrelated with noise in signals Hx and Hy. (Anav et al., 1976).

$$Tx = ([HzRx^*]\,[HyRy^*] - [HzRy^*]\,[HyRx^*]) \,/\, ([HxRx^*]\,[HyRy^*] - [HxRy^*]\,[HyRx^*]), \qquad (4)$$

and

$$Ty = ([HzRy^*]\,[HxRx^*] - [HzRx^*]\,[HxRy^*]) \,/\, ([HxRx^*]\,[HyRy^*] - [HxRy^*]\,[HyRx^*]). \qquad (5)$$

Where:

Rx is the reference field x component, Ry is
the reference field y component.

An additional two electromagnetic sensors, providing these reference signals can be placed at some distance away from the main x, y and z sensors. Currently, though, no additional remote-reference processing are applied to ZTEM data.

NUMERICAL MODELLING

In order to understand the airborne AFMAG responses to conductors for a variety of geological environments, EMIGMA™ modelling code from PetRos EiKon (Toronto, ON) was obtained to conduct the formulated model studies.

Below are some of the modelling results from their study.

Modelling assumption:

The assumptions for the modelling are that:

3 components of the magnetic field are measured and they are processed according to: Hz(f) = Tx (f)

Hx (f) + Ty (f) Hy (f)

The vector (Tx,Ty) is usually referred to as the 'tipper' vector and is determined in the frequency domain through processing. This is normally done by determining transfer functions from an extended time series.

For the modelling exercise, the 3 components of the magnetic vector (Hx,Hy,Hz) are modelled twice for 2 orthogonal polarizations of a plane wave source field and then the tipper is calculated from a matrix calculation using the results of the 2 source polarizations' models. For the 2D forward modelling results, the tipper vectors are shown as a function of frequency

BASIC MODEL RESPONSE

For the initial models, we assume a thin plate-like model. The model is perpendicular to the flight direction. Initially, we will assume very long strike directions. From this quasi-2D model, there are 2 basic responses. The so-called TE response and the so-called TM response.

For the initial models, we will assume the strike is in the y (North) directions and the flight is in the x (East) direction Sensor heights are 30m above ground.

TE Mode: For the TE response, the electric field excitation flows along strike (current channelling) and the horizontal H field (Hx) flows perpendicular to strike thus causing induction through Faraday's law. The Hz response is generated both from channelling and induction.

TM Mode: For this response, the electric field excitation flows perpendicular to strike generating quasi-static charges on faces and the horizontal H field (Hx) flows parallel to strike. Since, the XZ face is very small for this model, little current is induced. The charges on the faces have a small dipole moment due to the thinness of the model.

For the rest of the models unless otherwise noted, the parameters used are: Strike Length: 1km

Depth Extent: 1km

Conductance: 100S Depth to
Top: 10m

Background: Thin-overburden (10m), Resistive Basement (1000 Ohm-m)

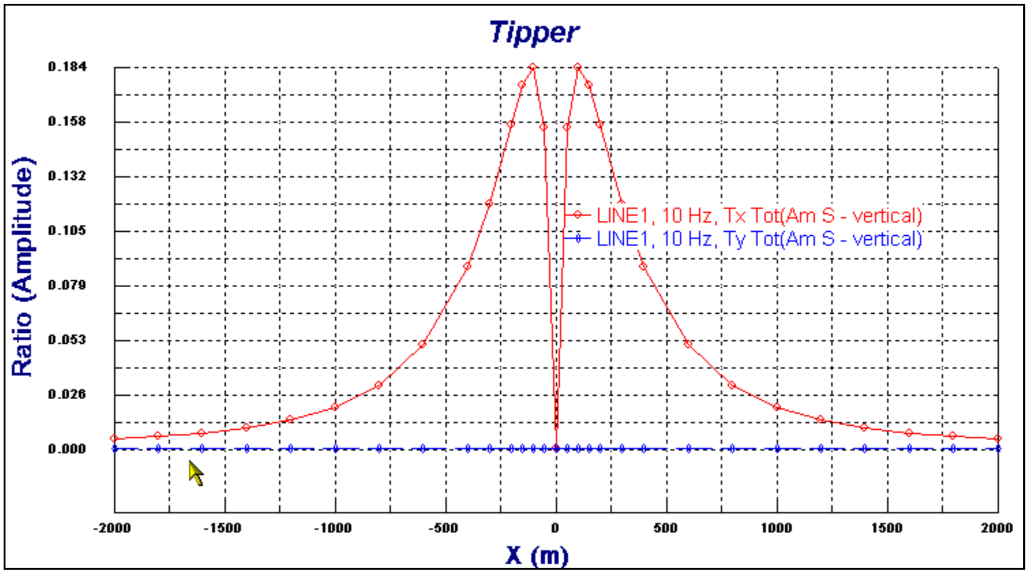


Figure D-1 – Calculated Tipper components at 10 Hz for above model parameters.

Figure D1 shows the Tipper (Tx,Ty) Amplitudes at 10Hz using a10^m overburden. Note small Ty (ie quasi-TM response)

AMPLITUDE RESPONSE

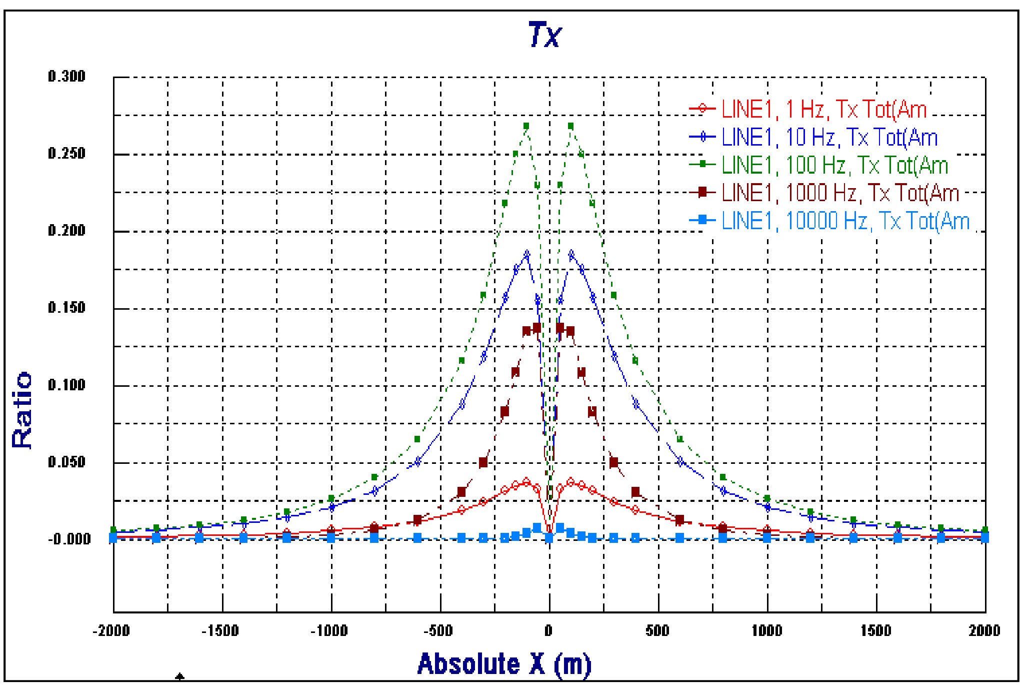


Figure D-2 – Calculated Tx component of the Tipper at various frequencies

The (Tx) response amplitude at 1,10,100,1000,10000 Hx. Peak amplitude at 100Hz

INPHASE AND QUADRATURE RESPONSE

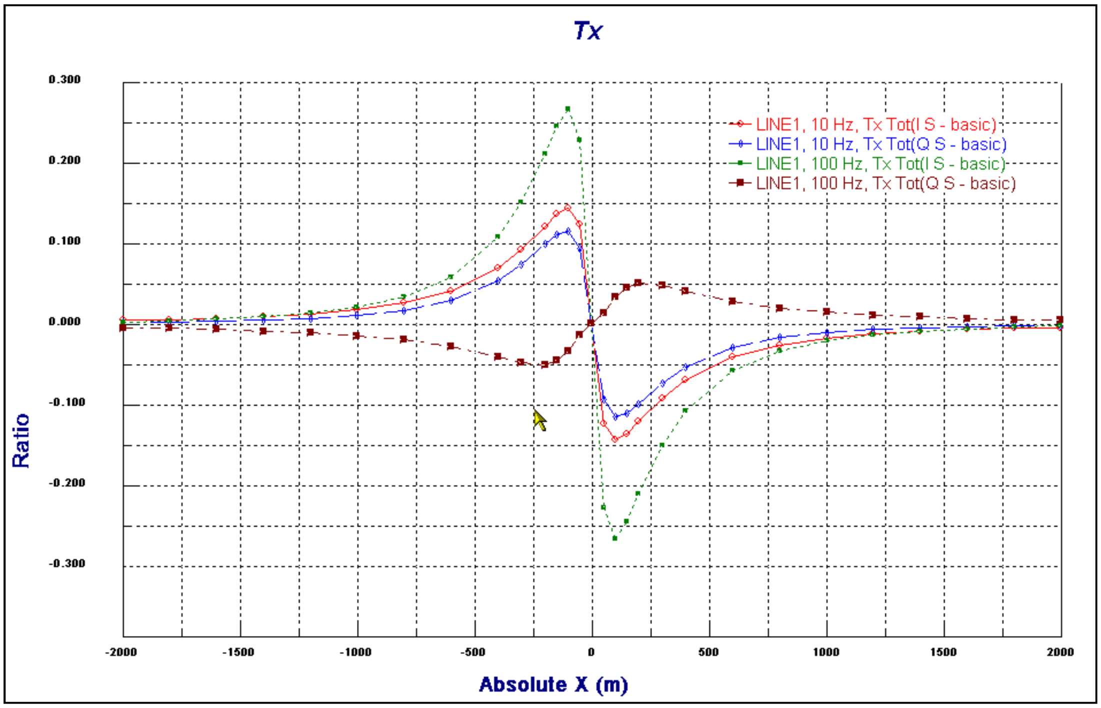


Figure D-3 – Calculated In-phase and Quadrature of the Tx component at various frequencies

Figure D-3 shows the In-phase and Quadrature response at 10 and 100Hz. Note the crossovers in the In-phase and Quadrature, and the phase reversal in the Quadrature responses from low to high frequencies.

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