GroundTruth Exploration

2020

2019 Ground Geophysics

Very Low Frequency Electromagnetics and UAV Drone Imagery

on the
Oz Property
Dawson City, Yukon

GRANT_NUM	LABEL
YC35959-972	Oz 1-14
YD130445-474	OZ 15-44
YD130485-492	OZ 55-62

NTS: 1:50,000 Map sheet 116B/12 & 116B/13

UTM: 559691 E 7180384 N

NAD83 Zone 7N

Dawson Mining District

Work Performed:
VLF: September 7, 2019
UAV Drone: September 7, 2019

Prepared for Shawn A. Ryan
By GroundTruth Exploration Inc.

Written By: Kaitlyn Crawford and Amir Radjaee
Compilation Date: March 30, 2020

Box 70, DAWSON, YT
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Summary

During the summer of 2019, Shawn A. Ryan commissioned GroundTruth Exploration Inc. to run a "Very Low Frequency Electromagnetic" survey (VLF+Mag) and UAV drone survey on the OZ property. On September 7, 2019, a crew of two VLF technicians and two drone operators were set out to the Oz property. 9.9 line km of VLF data was acquired on twelve 800 m lines and the UAV drone survey was performed over 10 km^2. The Oz property is located 77 km north of Dawson City, in the Dawson mining district. Helicopter staging for the property was out of Dawson City, the closest permanent supply settlement.

The Oz claims were originally staked in 1974 by Dynasty Exploration Ltd.. Geochemical sampling, geological mapping and drilling has been done on the property. Shawn A. Ryan re-staked 14 claims as Oz in 2005 and staked the other 39 claims in 2011. Since then he has conducted a drone survey as well as an IP/Resistivity survey.

The North American shelf has three erosional inliers in Western Yukon. These are Proterozoic erosional windows of the northwestern Cordillera. The inliers are unconformably overlain by Cambrian and younger platformal carbonate rocks to the north, west and east. The south of the platformal carbonates are truncated by the Dawson Fault. The property lies in an area known as the Coal Creek Inlier. The main rock types on the Oz property are primarily dolomite and stromatalitic dolostone.

Mineralization is found to be associated with breccias and faulting in the area. Underlying geophysical anomalies can indicate structures associated with mineralization. Further geophysics, bedrock mapping and soil sampling is required to fully understand the potential of the property.

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Introduction

During the summer of 2019, Shawn A. Ryan commissioned GroundTruth Exploration Inc. to run a “Very Low Frequency Electromagnetics” (VLF+MAG) survey and a UAV Drone survey on the OZ property. The property is 77 km north of Dawson City, the location of the main helicopter staging area. The property is located on the National Topographic System NTS Map sheet 116B/12 and 116B/13. The approximate center of the property is 559691E 7180384N.

On September 7, 2019 a crew of two VLF technicians and two drone operators were set out to the Oz property. 9.9 of VLF data was acquired on twelve 800 m lines. Lines were set at 100 m spacing. This was follow up work for the drone work done during the summer of 2018. The UAV Drone covered 10 km^2 of the Oz claim block.

Location and Access

The Oz property is located 77 km north of Dawson City, in the Dawson mining district. Helicopter staging for the property was out of Dawson City, the closest permanent supply settlement. The property is located on the National Topographic System (NTS) Map sheet 116B/12 and 116B/13 (Figure 1). The approximate center of the property is 559691 E and 7180384 N.

The property is remote with no road access in the area. Elevation ranges from 1100 to 1600m with prominent slopes. Small creeks flow in the center of the valleys. On the western portion of the property there are talus slopes with moss or bare soil in between large rocks.

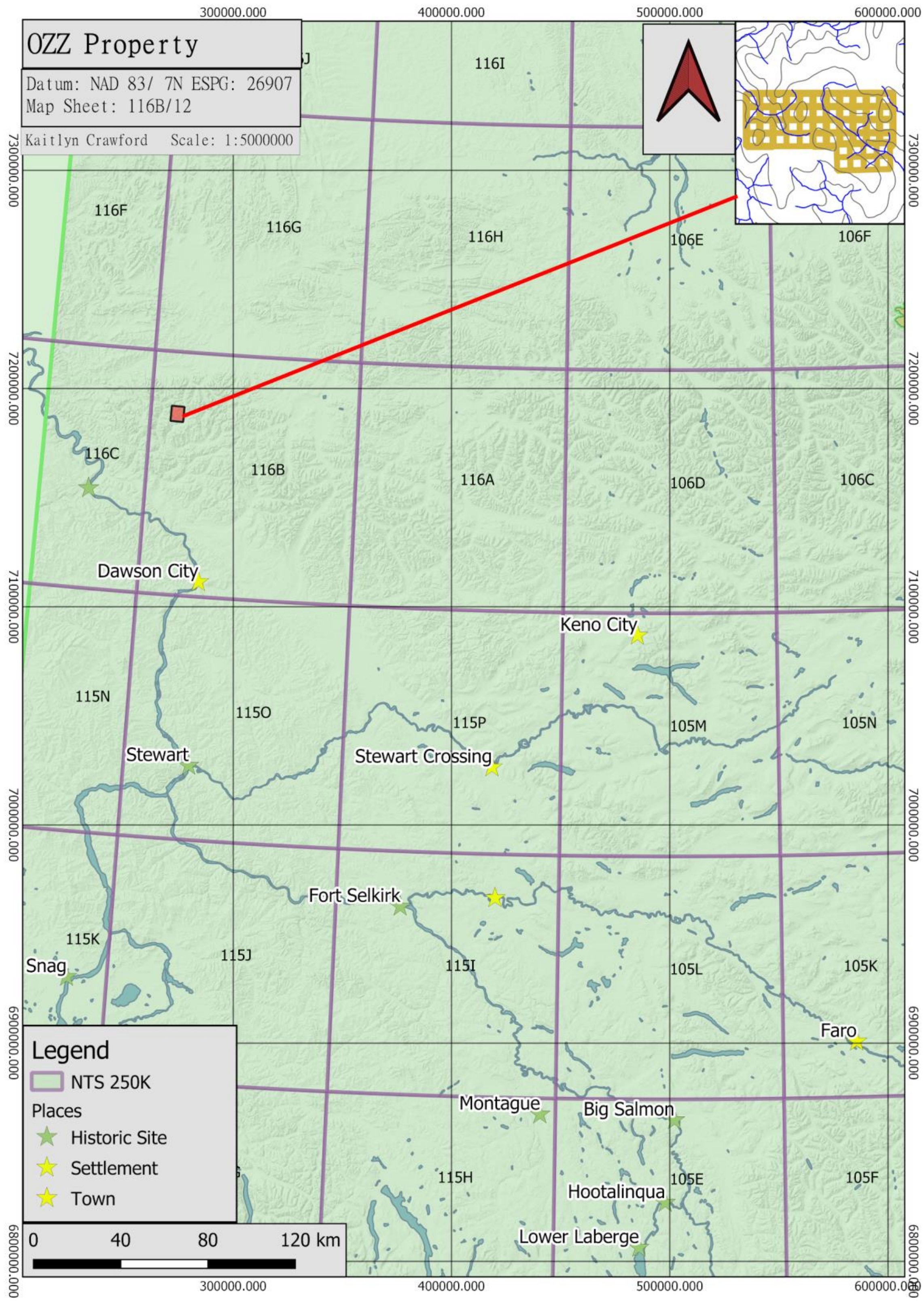

Figure 1: Location of the OZZ property on NTS map sheets

Claims

The OZ property is composed of 54 claims, all active and 100% owned by Shawn Ryan. A summary of these claims is below (Table 1). Most of the work was done on grant numbers YC35959-YC3596, YD130459, YD130461, YD130487, YD130489, YD130491 (Figure 1, Table 2).

GRANT_NUM	STATUS	LABEL	OWNER	STAKE_DATE	RECORDED	EXPIRY_DAT	DISTRICT
YC35959-972	Active	Oz 1-14	Shawn	5/29/2005	6/2/2005	6/2/2020	Dawson
YD130445-474	Active	OZ 15-44	Shawn	3/6/2011	3/9/2011	3/9/2020	Dawson
YD130485-492	Active	OZ 55-62	Shawn	3/6/2011	3/9/2011	3/9/2021	Dawson

Table 1: Claims that had work done on them in 2019

GRANT_NUM	CLAIM_NAME	CLAIM_NUM	OWNER	EXPIRY_DAT	Mapsheet
YC35959-YC35962	Oz	1-4	Shawn	6/2/2020	116B/12
YD130459	OZ	29	Shawn	3/9/2021	116B/12
YD130461	OZ	31	Shawn	3/9/2021	116B/12
YD130487	OZ	57	Shawn	3/9/2021	116B/12
YD130489	OZ	59	Shawn	3/9/2021	116B/12
YD130491	OZ	61	Shawn	3/9/2021	116B/12

Table 2: Summary of the OZZ claims

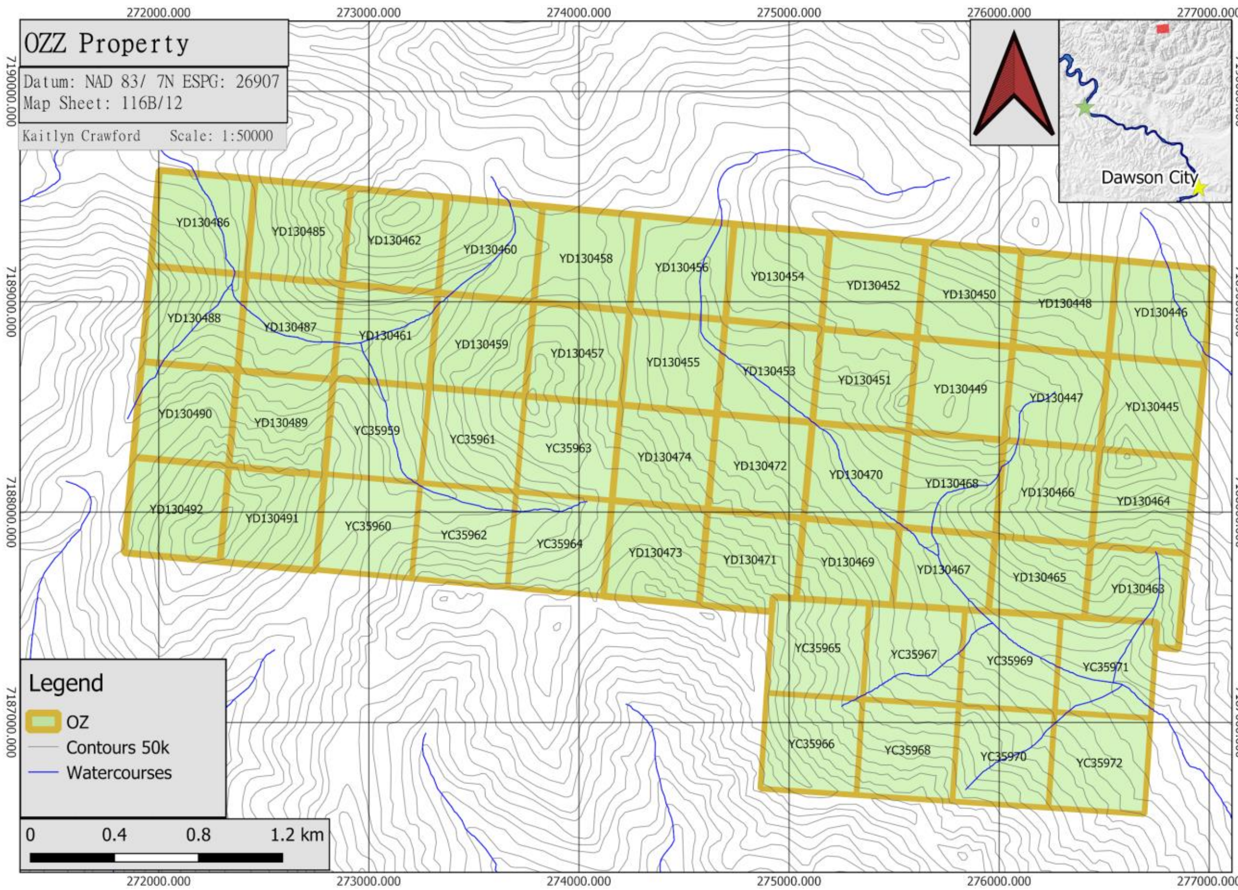

Figure 2: OZZ claims with grant numbers

History and Previous Work

The Oz claims were originally staked in 1974 by Dynasty Exploration Ltd. Mapping, as well as soil and rock geochemistry were performed on the property that same year. In 1975, the claims were transferred to Cyprus Anvil Mining Corp. Additional mapping, soil geochemistry, hand trenching and 379.5 meters of drilling was completed in 3 holes.

Enterprise Exploration Ltd. re-staked the claims as Harp in 1982. The claims were then transferred to U. Schmidt & E. Jensen, who prepared a topographic map in 1985. In 1991 U. Schmidt expanded the claims. Finally, in 1995, the Harp claims were transferred to Jensen. In 1996, 1 km to the north, Schmidt completed a property site map showing the location of claim posts, trenches and old drill hole locations. Schmidt also completed grid soil sampling, a radiometric survey and prospecting program. In 1996, High Sense Geophysics Ltd. under contract to Equity Engineering Ltd. flew a regional, helicopter borne, magnetic and radiometric survey over most of the Coal Creek Inlier, but no new claims were staked.

Shawn A. Ryan re-staked 14 claims as Oz in 2005 and staked the other 39 claims in 2011. During the summer of 2018 Resistivity and Induced Polarization survey was completed (Figure 3).

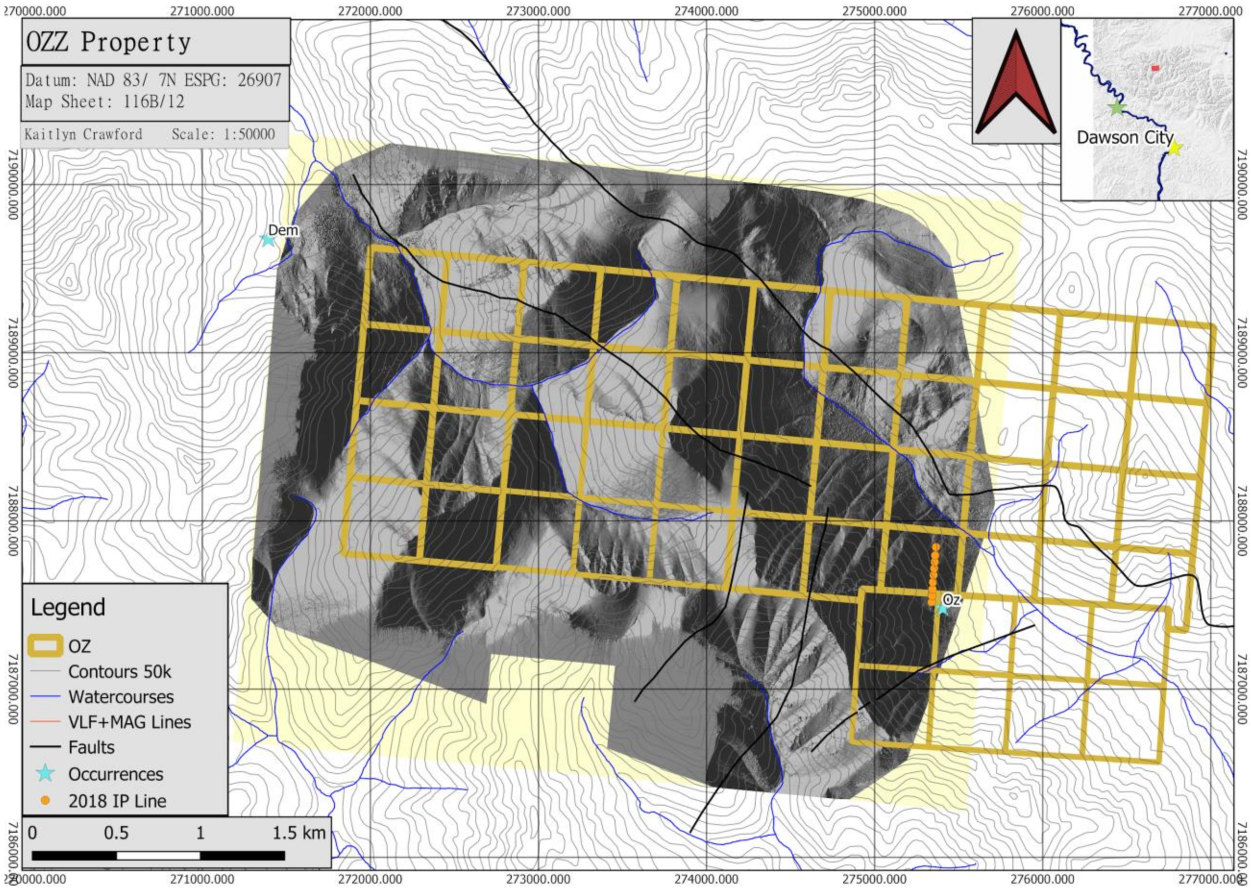

Figure 3: 2019 DMS 30cm drone imagery and location of the 2018 IP resistivity line

Geology

Regional Geology

The North American shelf has three erosional inliers in Western Yukon (Figure 4). These are Proterozoic erosional windows of the northwestern Cordillera. The inliers are unconformably overlain by Cambrian and younger platformal carbonate rocks to the north, west and east. To the south the platformal carbonates are truncated by the Dawson Fault. The property lies in an area known as the Coal Creek Inlier.

The Coal Creek Inlier is a mountainous area in West Central Yukon. This inlier is dominantly sedimentary strata from the Wernecke Supergroup, Fifteenmile Group and the Mount Harper Group. The Wernecke Supergroup is the oldest of these units and unconformably underlies the Fifteenmile Group. The Mount Harper Group overlies the Fifteenmile Group and is the youngest (Macdonald and Roots, 2010).

The Wernecke Supergroup comprises the Fairchild Lake Group, the Quartet Group and the Gillipsie Lake Sediments. The latter is found on the Oz property. These groups are found in the northern half of the outlier as fault bounded blocks (Kunzmann et. al., 2014). These rocks are shallow water fine-grained clastic and carbonate rocks (Strauss et. al., 2014). This unit is cut by the mafic intrusions of the Wernecke Breccias.

The lower Fifteenmile Group is the Gibben Formation and the Chandindue Formation, while the upper succession is the Reef Assemblage and the Craggy Dolostone (Kunzmann et. al., 2014). The Gibben Formation is found on the Oz property. The Lower section of the Fifteenmile Group are clastic rocks and dolostone. The Gibben Formation reflects a shallow marine carbonate environment on tidal flats with a sharp transition into the Chandindue Formation. The Chandindue Formation has more siliclastic deposition in a tidal flat environment. The upper portion of the Fifteen Mile Formation is a Transgressive-Regressive cycle (Macdonald and Roots, 2010).

The Callison Lake dolostones are the oldest group of the Windemere Supergroup. Above those are the Mt. Harper Formation sediments. The Callision Lake Dolostones unconformably overlie the Fifteenmile Group. Rocks of this succession are light grey to white weathering limestone, dolostones and breccias. The dolomites have stromatalitic characteristics (Macdonald and Roots, 2010). These rocks are Neoproterozoic in age.

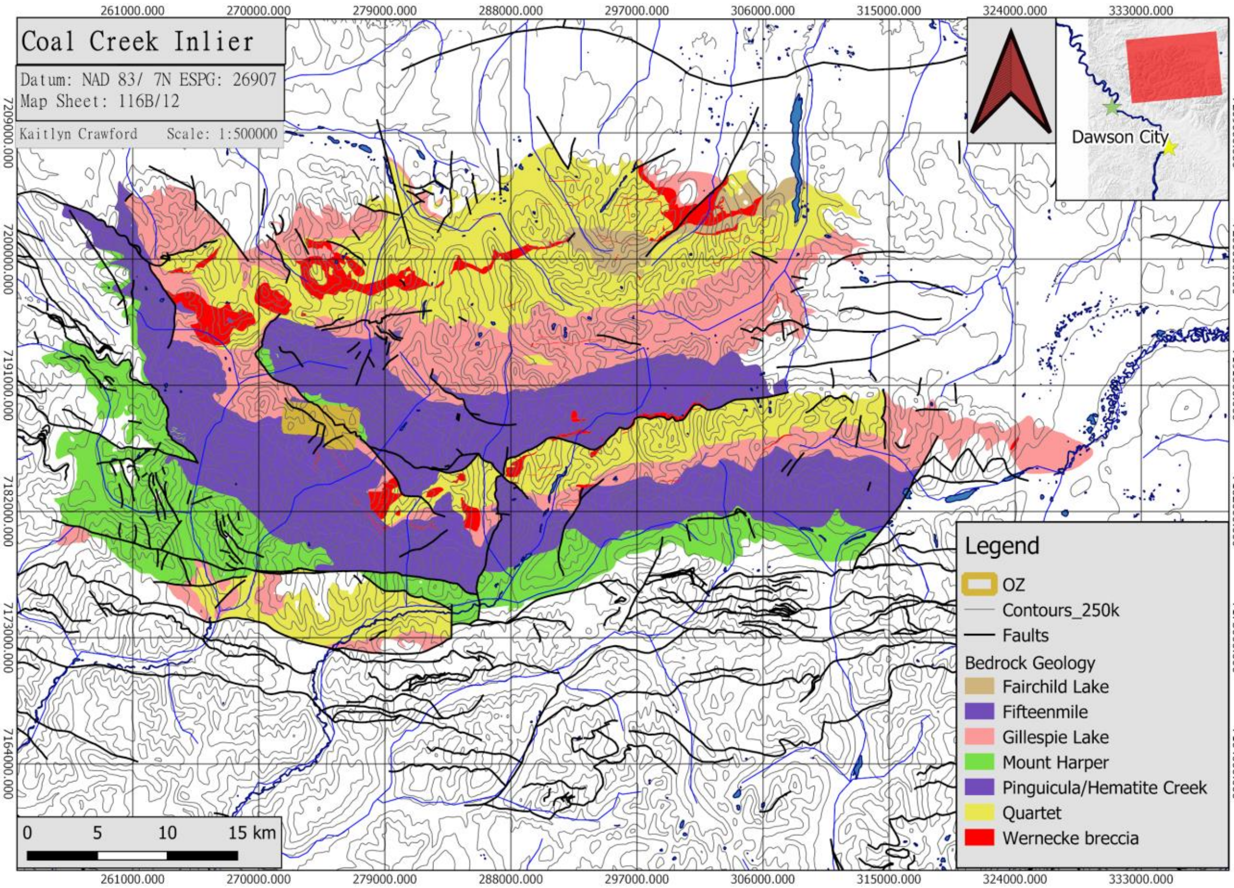

Figure 4: Coal Creek inlier with the location of the OZ property

Property Geology

There are four rock groups found on the Oz claims. The Gillespie Lake Suite dolomites and the Mackenzie Mountain dolomites underlie most of the property (Figures 5 and 6). In the northeastern portion of the property are the Callison Lake Formation dolomites. Thin mafic intrusions of the Wernecke Breccia Suite occur on the property as well.

The oldest unit on the property is the Paleoproterozoic Wernecke Formation of the Gillespie Lake Suite. These rocks are typically orange weathering dolomites, silty carbonates and minor amounts of shale (Thorkelson, 2000). This unit is often seen brecciated, thin to medium banded or massive. The rocks are typically light to dark grey-green brown in colour (Dickinson, 1975).

The Gibben Formation of the Fifteen Mile Suite are Neoproterozoic in age. This unit unconformably overlies the Pinguicula Group sediments. The thickness of this unit varies due to extensional tectonics at the time of deposition (Kunzmann et. al., 2014). The dolomites found within this unit are cherty, black and may have minor amounts of stromatalitic dolomite. Rocks are massive with light buff cream to dark grey weathering surfaces with sandy/crystalline texture (Dickinson, 1975).

Thin, plutonic mafic intrusions of the Wernecke Breccia Suite are Mesoproterozoic in age and cut both the Wernecke Formation and the Gibben Formation, but do not cut the upper Fifteenmile Group units

(Macdonald and Roots, 2010).These occur as swarms and are only 10-100 feet in width (Dickinson, 1975). These intrusions are diabase and usually follow north-south trending fault zones.

The youngest rocks on the property are the Callison Lake Formation dolomites of the Windemere Supergroup. This group is in the northeastern portion of the property. These dolostones have a light grey weathering surface and are nearly massive (Dickinson, 1975).

Approximately 14 km south of the property lies the Dawson Thrust Fault. Further southwest of the property is the Tintina strike slip fault. Faults on the property tend to follow a north-south trend. Cleavage dips steeply in both a north and south direction. Folds are highly deformed and have a plunge f 270° and 90° (Dickinson, 1975).

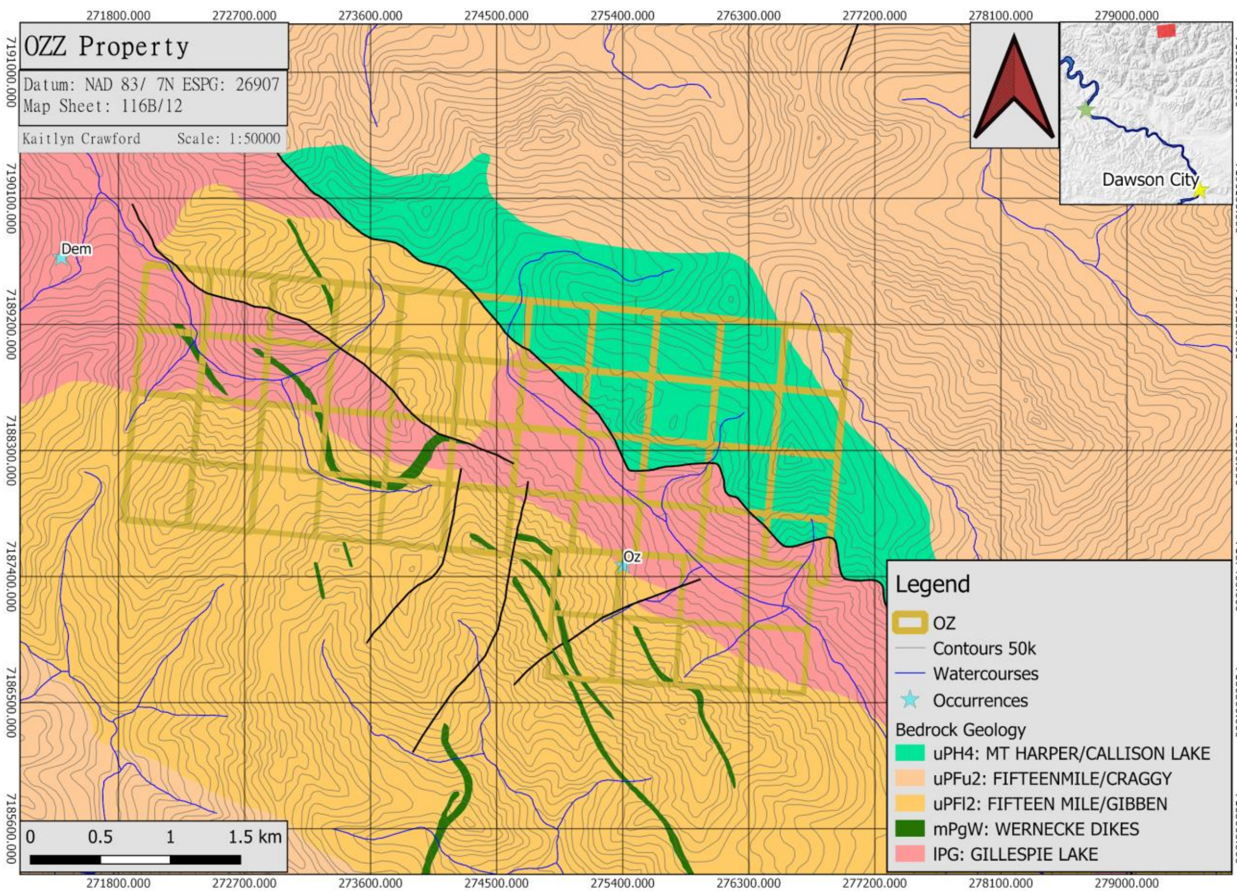

Figure 5: Property geology based on Thompson et. al., (1994) and Strauss et. al., (2014)

Legend

Bedrock Geology

uPH4: MT HARPER/CALLISON LAKE:	stromatolitic dolostone, laminated sandstone, siltstone, and shale
uPH5: MT HARPER:	diabase dikes and sills
uPFu1: FIFTEENMILE/REEFAL:	black to brown-coloured shale, siltstone, minor sandstone and conglomerate
uPFu2: FIFTEENMILE/CRAGGY:	thick-bedded and massively recrystallized, silicified sucrosic dolostone
uPFl2: FIFTEEN MILE/GIBBEN:	grey ribbon-bedded dolostone, oolitic grainstone, stromatolitic dolostone
uPFl3: FIFTEENMILE/CHANDINDU:	basal maroon shale and siltstone
uPP3: PINGUICULA:	undivided red, green and grey slaty argillite, light grey quartzite, dolostone
mPgW: WERNECKE DIKES:	diabase dikes
lPG: GILLESPIE LAKE:	dolostone and silty dolostone, locally stromatolitic

Table 3: Rock descriptions for property geology based on Strauss et. al., (2014)

Mineralization

Within the immediate vicinity of the property there are occurrences of two different mineralization styles. In the center of the property is the Oz showing which is a sediment hosted Mississippi Valley style showing. The DEM showing is a Volcanogenic Sulfide showing. There are many other showings within a 15k m radius of the area.

There are two distinct styles of mineralization associated with the Oz showing. The first is lead-zinc strata-bound sulphide mineralization within the black shale beds. Grains of disseminated galena, minor sphalerite and barite are associated with this mineralization. This style of mineralization is thought to be sedimentary in origin. During the drilling of the property, the best grades were up to 30% Pb + Zn with 102.9 g/t Ag and associated with brecciated zones related to faulting. The adjacent rocks were dolomite breccias that had calcite, barite, red-brown sphalerite and minor galena that was fracture filling (Yukon Mine Files, 2019).

The second type of mineralization is associated with the Wernecke Breccia unit. Lead-zinc mineralization is associated with copper in the form of chalcopyrite. The breccia pipes were found as local float and are associated with northeast trending faults.

The DEM showing is found within the same rock unit as the Oz showing. Diabase dykes have trace amounts of disseminated pyrite, chalcopyrite and minor amounts of chrysotile asbestos. Local disseminations of pyrite, malachite, chalcopyrite, galena and minor hydrozincite are found within quartz carbonate veins that are hosted by 5-75 cm shears. These same mineral assemblages are found within the matrix of the dolomite breccias.

2019 Exploration Program and Results

VLF/Mag Survey

On September 7, 2019 two VLF technicians were set out on the Oz property. A total of 9.9 line-km of VLF data was acquired on twelve survey lines. The survey collected 972 readings at 10 m station spacings. The VLF was completed over 3 rock groups on the property, the Gillespie Lake Suite dolomites, the Gibben Formation dolomites and the Wernecke diabase dykes (Figure 7).

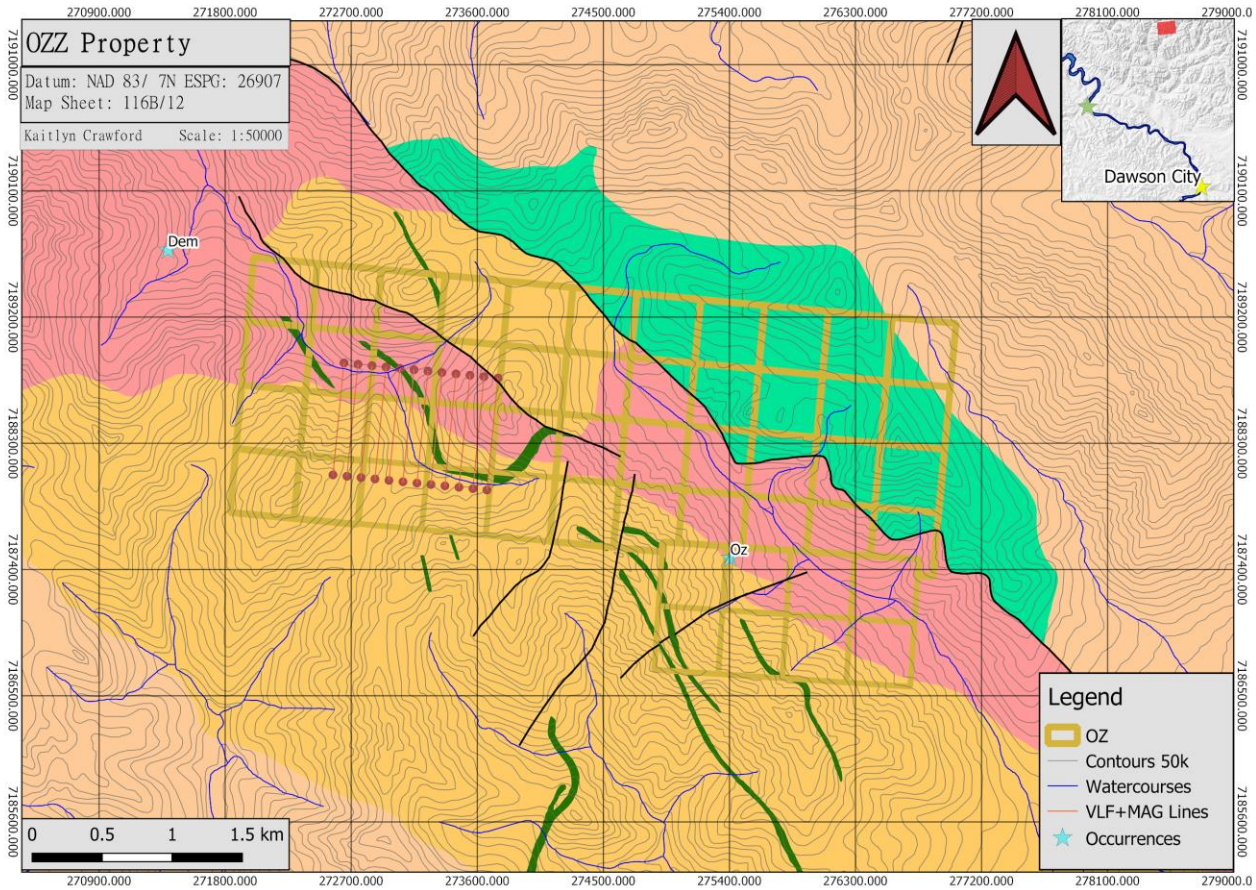

Figure 6: Location of VLF lines done during the summer of 2019 over the bedrock geology

Methods and Procedures

Data was acquired using GEM-19 portable VLF systems supplemented by a high-sensitivity proton magnetometer. The magnetometer has an absolute accuracy of +/- 0.2nT. 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 removal of unwanted noise arising from solar and atmospheric activity. Total coverage of the survey block amounted to 9.9 line-km along 12 survey lines taking 972 readings at about 10 m station spacing. The survey lines are oriented N-S (0° AZ) with line spacing of 100 m. The in-phase and out-of-phase
(quadrature) signals were measured as the percentage of total field for three frequencies.

The methods and procedure for VLF/Mag surveys are discussed fully in the report "OZ GEOPHYSICAL REPORT GROUND VLF AND MAGNETIC SURVEY" by Geophysicist Amir H. Radjaee*, Ph.D., P.Geo* in Appendix I.

Analysis

Once each survey was completed in the field, the data measurements were downloaded and reviewed to ensure the quality of the data collected. This allowed field errors to be addressed before moving the equipment. The VLF+Mag datasets were processed daily by the operator using EarthImager 2D software provided by Advanced Geosciences Inc. Data collected in the field was then processed by the Ground Truth Exploration Inc. geophysicist, Amir Radjaee.

The data is processed for magnetic diurnal correction and the Fraser filter is applied on in-phase and quadrature components of VLF data. The data can be processed in advanced levels using inversion modelling techniques recently developed for the 2D inversion of VLF data. The EMTOMO-VLF2Dmf which is a software program for the 2D inversion of VLF-EM data based on the finite element (FE) method. This will ensure that geological models respect a consistent structural, stratigraphic, and topological framework in addition to ensuring consistency between different geophysical models.

Results

The data taken during the 2019 filed season was processed by Geophysicist Amir H. Radjaee*, Ph.D., P.Geo.* Full details can be found in "OZ GEOPHYSICAL REPORT GROUND VLF AND MAGNETIC SURVEY", Appendix I. The data was processed using, Fraser lens 214 (Figure 8), Fraser lens 222 (Figure 9), Fraser lens 252 (Figure 10), and Fraser lens RMI (Figure 11).

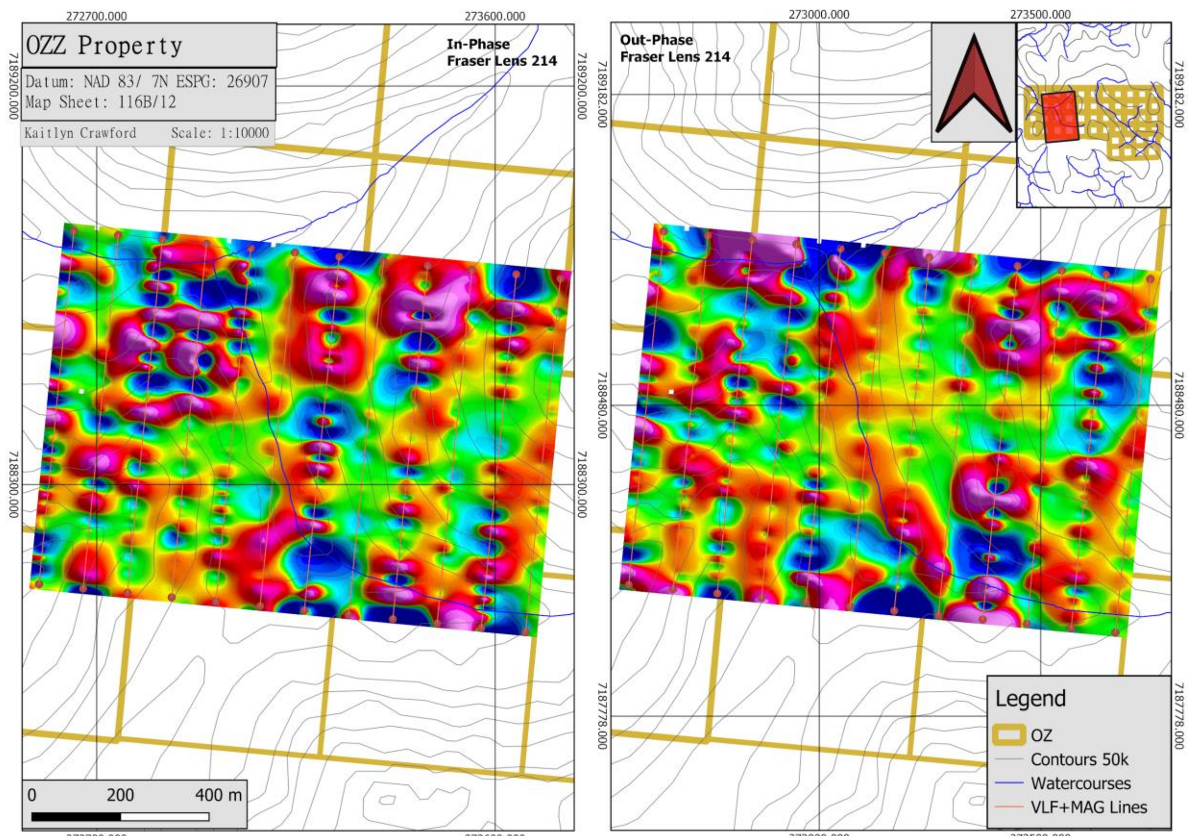

Figure 7:Walking VLF taken during the 2019 field season. A 214 Fraser filter was used to process the data

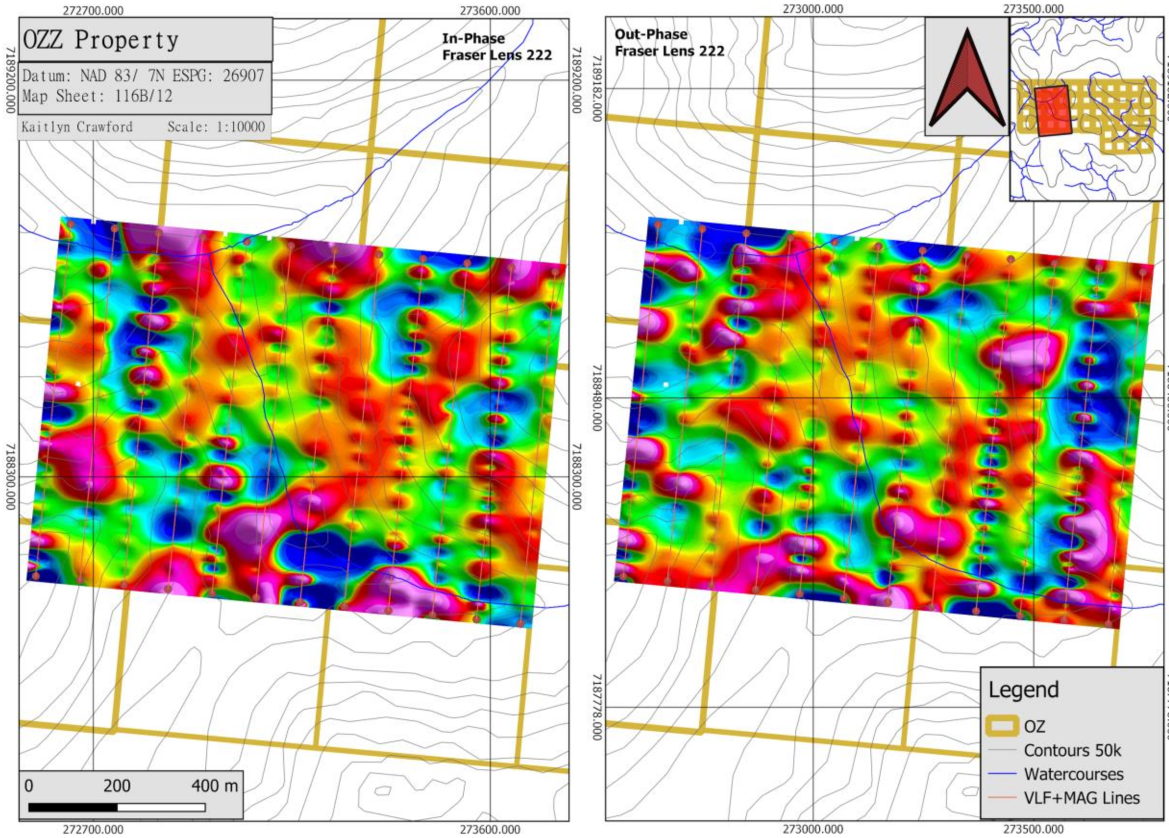

Figure 8: Walking VLF taken during the 2019 field season. A 222 Fraser filter was used to process the data

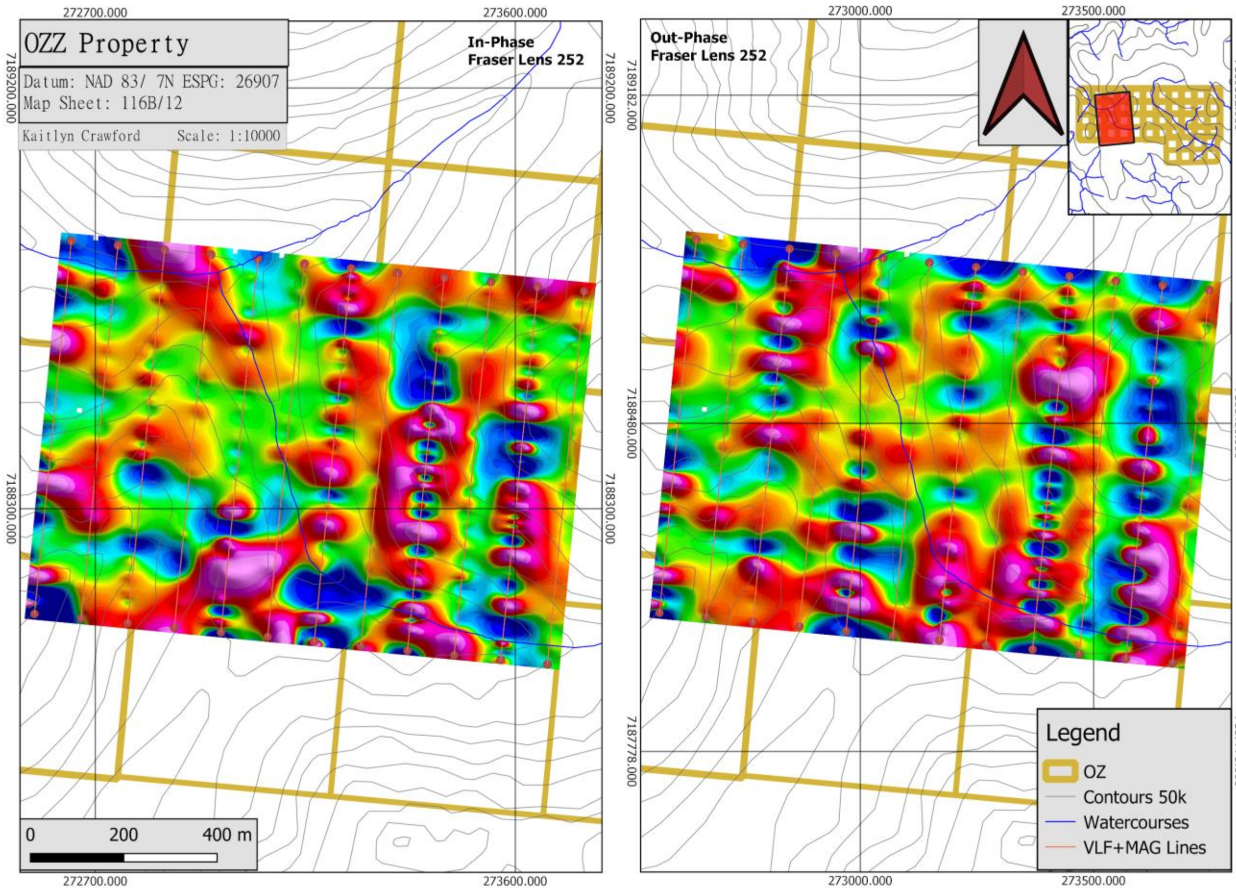

Figure 9:Walking VLF taken during the 2019 field season. A 252 Fraser filter was used to process the data

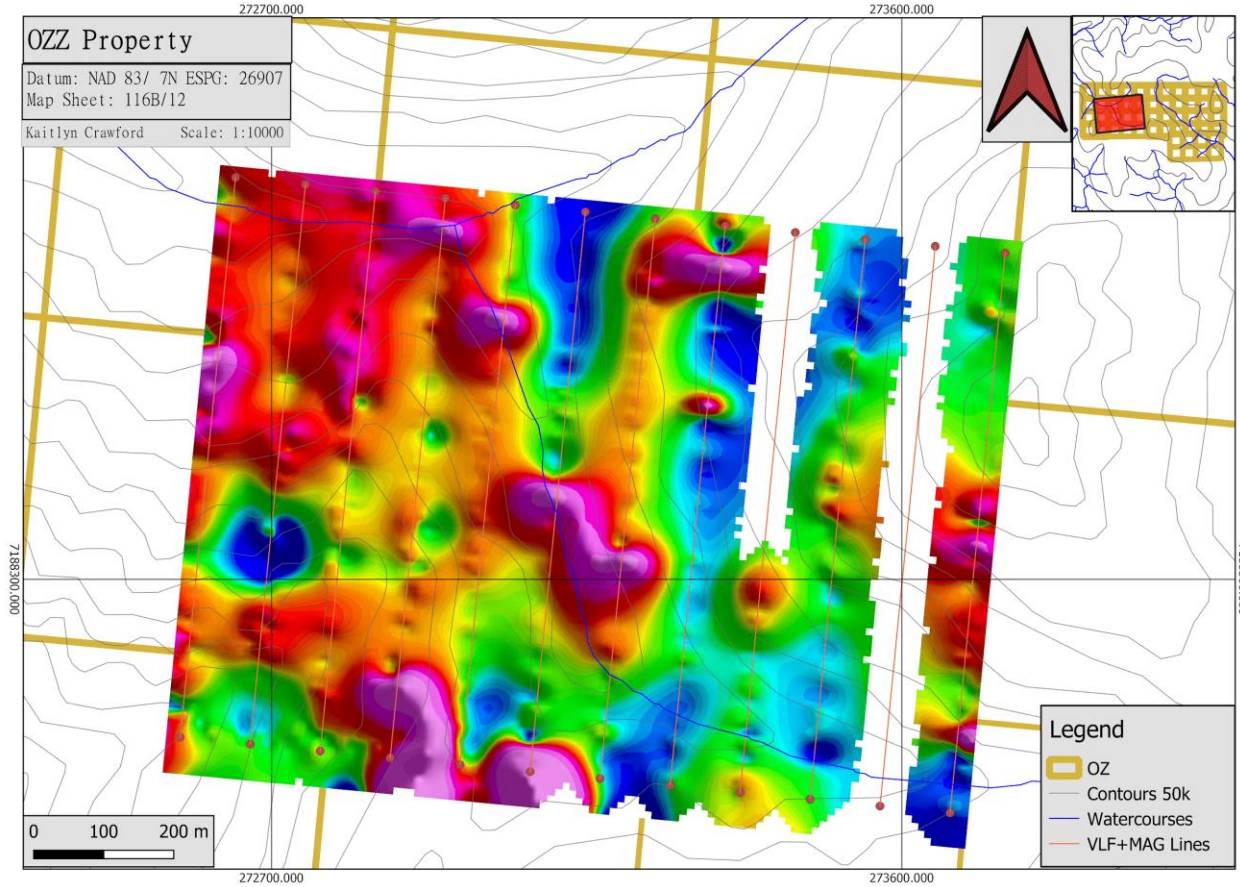

Figure 10:Walking VLF taken during the 2019 field season. A RMI Fraser filter was used to process the data

UAV Drone Imagery

The UAV Drone survey consisted of a 1-day survey performed on September 7, 2019. A lead UAV operator and assistant UAV operator (spotter) were employed to run the survey. A total of eight flights were run to cover the claim block.

The Drone survey lines and spatial resolution are approved by client prior to survey, and are designed in accordance with June 1, 2019 Transport Canada RPAS regulations. Typical flight time is approximately 30 minutes per flight, less if the operations area is experiencing high winds.

Results

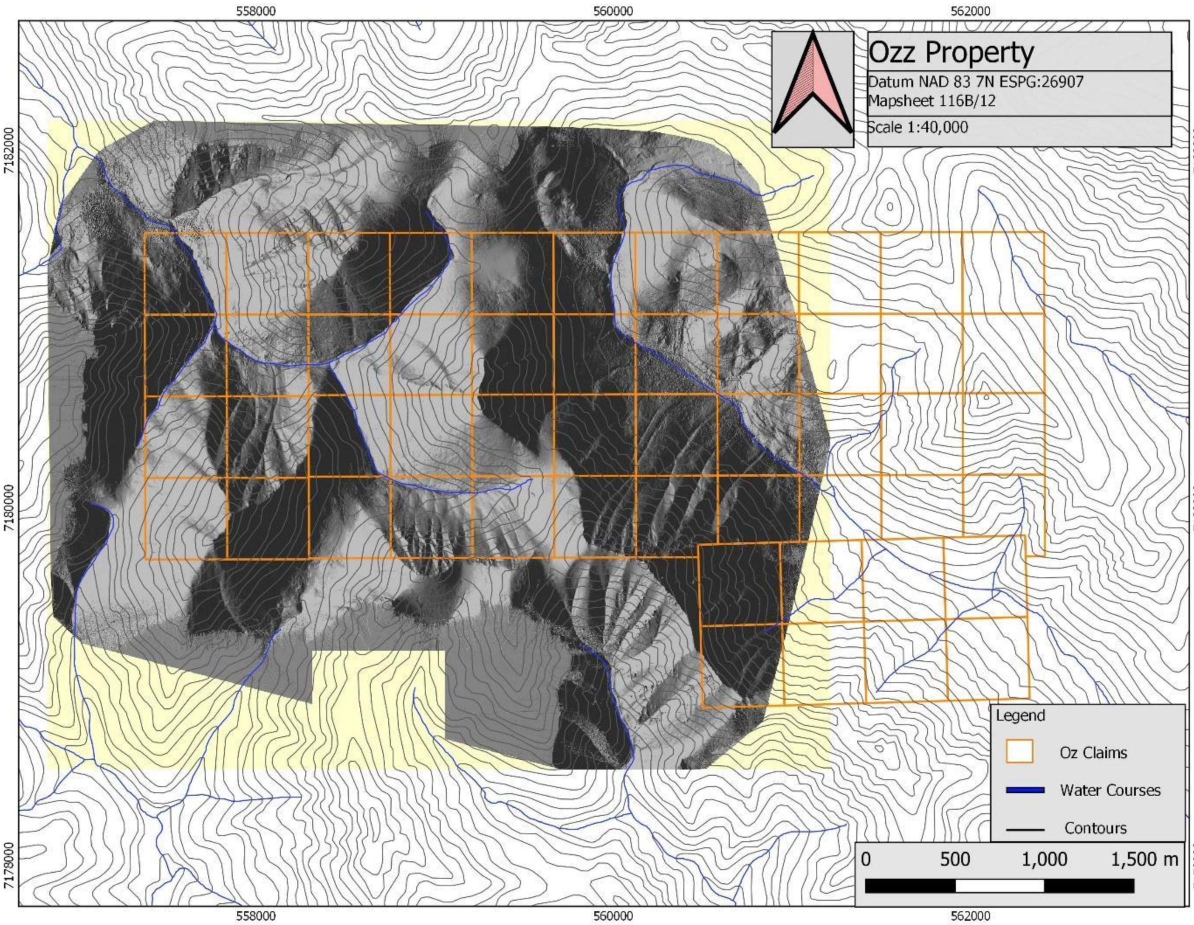

Figure 11: 2019 DSM 30cm Drone Imagery

Interpretation and Conclusions

The diabase dikes mapped in the area do not occur as an apparent magnetic high in the survey completed during the 2019 field season. The OZ property may need to be mapped in more detail to understand the full extent of the diabase dikes and the general geology of the property.

Recommendations

Follow up work should be completed on areas covered by the IP Resistivity survey in 2018 and the VLF+Mag survey in 2019. Mineralization is found to be associated with breccias and faulting and any geophysical anomalies identified should be followed up on. Additional surveys should include prospecting and soil sampling to identify potential trends and hopefully uncover additional intrusions in the area. Rotary Air Blast drilling is then recommended to further evaluate any mineralized structures found.

References

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Thompson, R.I., Roots, C.F. and Mustard, P.S., (1994). Geology of Dawson Map Area (116B,C) (Northeast of Tintina Trench). *Geological Survey of Canada,* Open File 2849, 13 maps, 1:50 000 scale.

Statement of Expenditures

VLF+MAG - 9.9 line km, UAV Drone - 10 km^2 - Sept. 7, 2019	
Labour (4 operators) and Equipment Rental	$ 2,430.00
Transnorth Helicopters (1 hour @ $1525/hr plus fuel)	$ 1,892.00
Data Processing and Assessment Report 8 hr @ $50/hr	$ 400.00
Total Expenditures	$ 4,722.00

Statement of Qualifications

I, Kaitlyn Crawford, do hereby declare that:

1. I am currently assisting with end of season report writing for GroundTruth Exploration Inc. of Dawson City, Yukon.
2. I graduated from Brandon University in 2018 with a B.Sc. degree in Geology.
3. I have worked as a geologist or geological assistant on and off since 2015.
4. I am not aware of any material, fact or material change with respect to the subject matter of this report, the omission to disclose which makes this report misleading.

Dated:

March 30, 2020

Appendices

GEOPHYSICAL REPORT
GROUND VLF AND MAGNETIC SURVEY

OZ (OZZ) Project

YT, Canada

Work Performed On: September 07, 2019

FOR:

Shawn Ryan
Dawson City, YT

Report# SRP-GVLF19-OZZ / Rev. 01

Prepared By:
GroundTruth Exploration Inc.
BOX 70, Dawson City, YT

Author: Amir H. Radjaee, *Ph.D., P.Geo*

March 2020

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1.0 Introduction

This report describes data acquisition and preliminary data processing results of the 2019 ground VLF and magnetic survey. The GroundTruth Exploration was commissioned by Shawn Ryan, Dawson City, YT to run the survey and process the data.

On September 7, 2019, ground VLF (GVLF) and ground magnetic (GMAG) surveys were completed over the OZ claims (OZZ) located in the Yukon Territory. This survey is a part of a comprehensive survey completed in order to target future exploration on the property. All data, grids and maps are delivered in NAD83 UTM Zone 7N.

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 proton magnetometer. The magnetometer has an absolute accuracy of +/- 0.2nT. 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 9.9 line-km along 12 survey lines tacking 972 readings at about 10m station spacing. The survey lines are in an azimuthal direction of N-S (NE 0°) with 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 flight lines are shown in Figure-1.

Table 1: The parameters of VLF Tx stations.

VLF Tx Station	Frequency (kHz)	Latitude	Longitude
NML, ND	25.2	46.365987°N	98.335667°W
NSS, MD	21.4	38.977778°N	76.453333°W
JJI, Japan	22.2	32.092247°N	130.829095°E

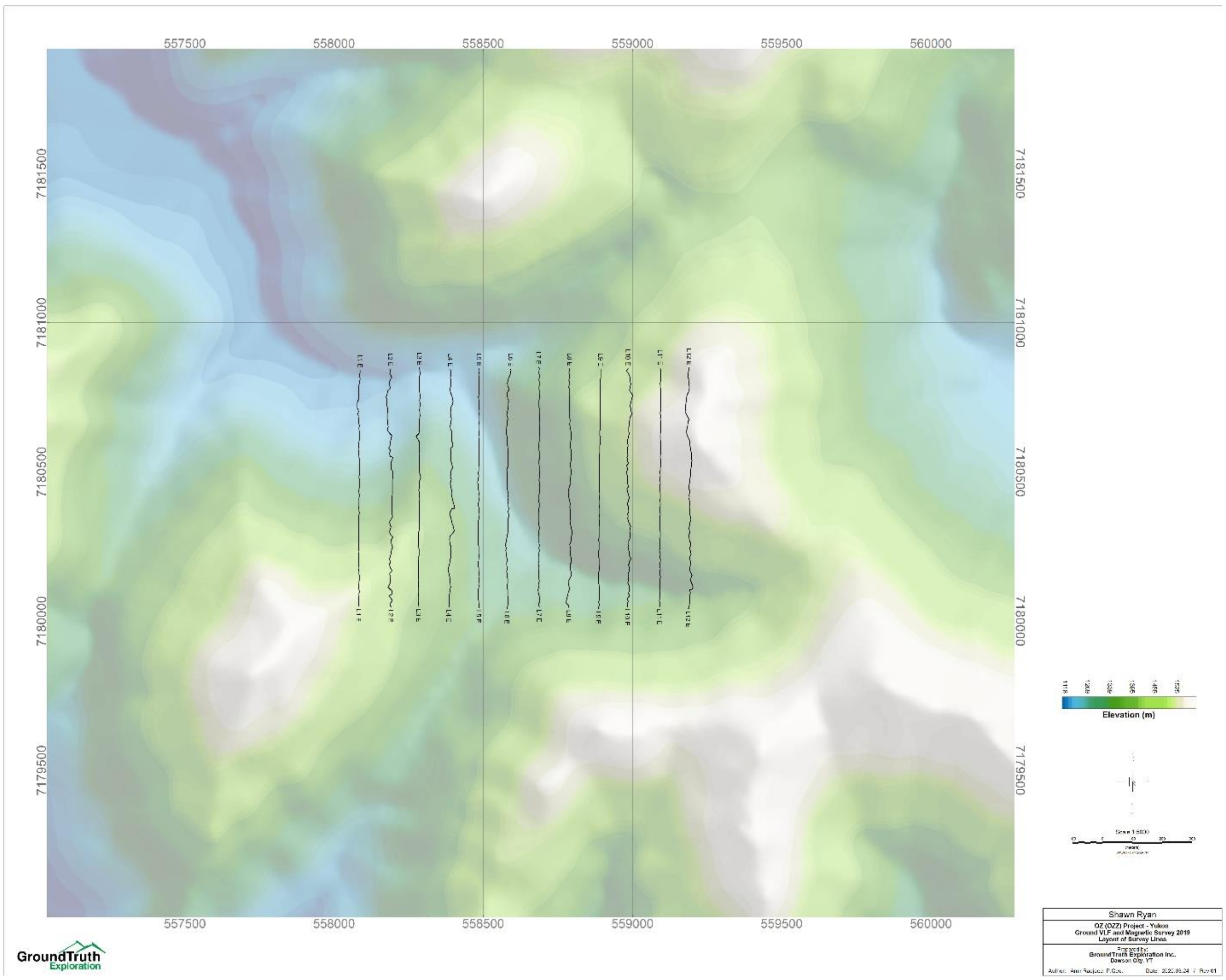

Figure 1: Location map of ground VLF/Mag survey 2019 on OZ (OZZ) property, YT.

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 comminucation. 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.

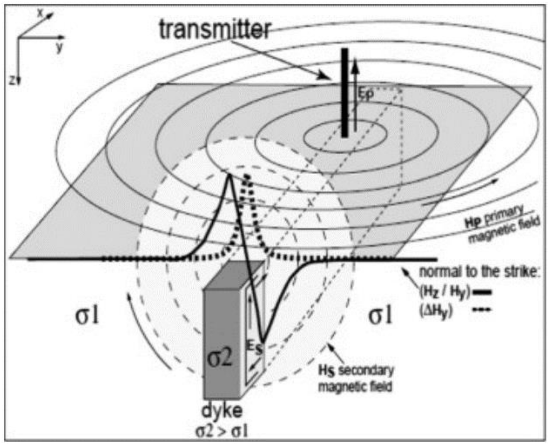

Figure 2: EM field distribution for the VLF method in E-polarization with theoretical signals over a vertical conductive dike (after Bosch and Müller, 2001).

4.2 Magnetic surveys

Magnetic 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, 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 also tilted. The north magnetic pole at the surface of the earth is approximately at Melville Island. 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.

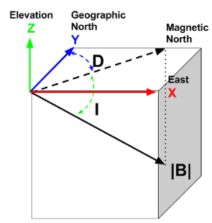

Figure 3: Earth's magnetic field, declination (D) and inclination angles (2018, GeoSci Developers).

5.0 Results and recommendations

The data are processed for magnetic diurnal correction and the Fraser filter are applied on in-phase and quadrature components of VLF data. The data can be processed in advanced levels using inversion modelling techniques recently developed for the 2D inversion of VLF data. The EMTOMO-VLF2Dmf which is a software program for the 2D inversion of VLF-EM data based on the finite element (FE) method. This will ensure that 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 and drilling information allows some general correlations to be made. The interpretations of VLF results can better identify lithological and structures features, as well as, the fracture zones.

6.0 Deliverables

Summary report in .pdf format

Database in Geosoft .dbf and .xyz formats

Fraser filter Grids in Geosoft and Tiff format

Magnetic Grids in Geosoft and Tiff format

Location Maps in .pdf and .jpg formats

Survey lines in Arcview shapefile format