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March 1st 2023

# **VLF Survey Report**

**Work Performed by  
Dan Patrie Exploration Ltd.  
On Behalf of**

**Bear Creek Gold Ltd.**

**In**

**Gaiashk & Joubin Townships  
Sault Ste. Marie, Ontario Mining Division**

**Brent Patrie**

**Dan Patrie Exploration Ltd.**

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## Introduction

The Gaiashk/Joubin claims are held by Precambrian Ventures Ltd, and Bear Creek Gold Ltd. A VLF Survey was conducted on the properties within the period of Nov 6<sup>th</sup> 2021 & November 7<sup>th</sup> 2021. A list of claims and holdings is provided in **Table 1**, a detailed map (**Figure 2**) represents the work performed within the claim group.

## Location and Access

The Gaiashk Properties are located in Gaiashk Township about 20 km east of the town of Elliot Lake, Ontario in the Sault Ste. Marie Mining District. The claims are centrally located at UTM Zone 17T 3388800mE, 5136600N, along the south and east ends of Pecors Lake (**Figure 1**).

Access to the property is by the Nordic Mine Road east from highway 108, approximately 4.5 km south of Elliot Lake, Ontario, traveling eastwards on a very rough seasonal road to Pecors Lake. An alternative access via ATV and the Hydro pole line north of Massey can be used as well. The Hydro pole line crosses Hwy 553 about 21 km north of Massey. A road adjacent the pole line can be driven by truck for a further 8 km to the west whereupon an ATV is needed to travel the remaining 8km westwards, to the Pecors Lake area.

## History & Geology

Since the early 2000s this claim group area has been held by Verbina Resources Inc, Dan Patrie Exploration Ltd, Bear Creek Gold Ltd & Precambrian Ventures Ltd, all companies and subsidiaries that hold joint partnerships/interest in the property and surrounding area. In 2008 Verbina Resources Inc performed an airborne magnetics survey displaying a high

mag anomaly within the southern borders of the current claim group (Assessment File - 20005471). No other work reports relevant to the property was discovered at the time of this report, the property had been either re-staked or work credits from adjacent properties were distributed in order to keep the claims in good standing throughout the years.

Elliot Lake, Ontario is known for its historical uranium mines, which represent one of two major uranium-producing areas in Ontario and one of seven in Canada. The Elliot Lake area was prospected for gold and copper during the 19th century, twelve uranium mines were opened in the vicinity of Elliot Lake, Ontario. In the recent decades interests within the Elliot Lake area have renewed, with several exploration companies prospecting for the possibilities of viable uranium and rare earth mineral deposits.

The Elliot Lake area lies within the Superior Geological Province of the Precambrian Canadian Shield of Northern Ontario at the boundary between the Southern and Superior Geological Provinces.

The oldest units make up the Archean basement of the Superior Province (>2500Ma) and consist of metavolcanic and metasedimentary units, granitoid, and minor mafic intrusive rocks. The Archean basement is overlain unconformably by Huronian metasedimentary rocks of Early Proterozoic age. The Huronian sequence is floored by mafic basalts (Thessalon Formation) of early Paleoproterozoic age (2450-2115 Ma). The Huronian sequence is subdivided into 4 Groups: Elliot Lake, Hough Lake, Quirke Lake and Cobalt Groups. The uranium deposits of the Elliot Lake area are confined to the Matinenda Formation at the base or near the base of the Elliott Lake group in quartz pebble conglomerates and arkoses.

Following deposition of the Huronian metasediments, post-Huronian intrusive rocks consisting of Nipissing age diabase-gabbro sills, post Nipissing dykes and sills, small felsic intrusive bodies and occasional lamprophyre dykes intrude the earlier units (2100Ma). A period of deformation followed called the Penokean Orogeny resulted in regional

folding and thrust faulting followed in turn by faulting between 1850-1750 Ma.

The metasedimentary and basal volcanic rocks in the Elliot Lake area are part of the Huronian Supergroup which are present from Sault Ste. Marie in the west, to the Cobalt area in the east.

Huronian metasediments are considered to be deposited during a period of marine transgression with an Archean basement landmass to the north and an ocean to the south. Sandstones (now quartzite), arkoses, conglomerates and argillites were laid down followed by more mature elastic sediments and marine chemical sediments.

The unconformity with the underlying Archean basement is sharp in some places while in others there is several meters of regolith, often represented by chlorite-rich lithologies. The Huronian Supergroup has been divided into 4 groups each containing several formations. Significant uranium, thorium and rare earth elements are found at a number of localities throughout the basin, usually in the Matinenda Formation within 40 meters of the unconformity. Uranium mineralization, for the most part, occurs in pyritic quartz pebble conglomerates and coarse-grained quartzite and arkose.

## References

Easton, R. M., 2013: Precambrian Geology, Pectors- Whiskey Area; Ontario Geological Survey

Reid, L. E., 2009: Report on the Interpretation of the VTEM Airborne Electromagnetic, Gaiashk Township, Elliot Lake Region, Ontario for Verbina Resources Inc.

Winter, L. D. S., 2009: Geophysical Report on Claim 4214924, Gaiashk Township (G-2906), Elliot Lake Area, District of Algoma, Ontario for Verbina resources Inc., Assessment Report.

Winter, L. D. S., 2011: Geophysical Report on Claim 4214924 (Pectors Claim), Gaiashk Township, Elliot Lake Area, Ontario for Five Nine Ventures Ltd., Assessment Report for MNDM, 13pp, 3 Figures, 3 Maps on the Magnetic and Gradient IP Survey.

Winter, L. D. S., 2012: Diamond Drilling report on Claim 4214924 (Pectors Claim), Gaiashk

Township, Elliot Lake Area, District of Algoma, Ontario for Five Nine Ventures Ltd., Assessment Report for MNDM, 22p.

## **Work Preformed, Personnel & Instrumentation**

Dan Patrie Exploration Ltd was contracted by Bear Creek Gold Ltd to conduct GPS- VLF survey within the claim group held by Bear Creek Gold and Precambrian Ventures in Gaiashk Township. The work was performed from November 6<sup>th</sup> 2021 to November 7<sup>th</sup> 2021.

Four DPE employees, Gabriel Roy (Smooth Rock Falls, Ontario), Justin Abramson (Sudbury, Ontario), and Nathan Murray (Sudbury, Ontario), Robert Kippax (Sudbury, Ontario) were tasked with carrying out the survey.

A 6km GPS grid was generated within the claims consisting of 100m line separations with reading points marked at 25meter intervals (**Figure 2**). The survey was conducted with one navigator using Garmin GPSmap 64 GPS units for navigation and survey point locating, and one worker equipped on their person with the Scintrex EnviMag coupled with OMNI Plus VLF Sensor Module used to collect data at each survey station. The terrain of the survey area consists of hardwood forest and hilly terrain, with no infrastructure located in the remote survey area(power transmission lines, roads, trails).

A VLF survey is a geophysical method that uses radio communication signals to determine electrical properties of the near surface. It involves measurement of the earth's response to electromagnetic waves generated by transmitters a great distance from the survey site. The source fields are effectively planar and of fixed orientation so the response depends on the orientation of anomalies with respect to the source fields. VLF surveys use the magnetic components of the electromagnetic field generated by existing radio transmitters broadcasting in the VLF (10-30 kHz) band.

The OMNI Plus VLF sensor module consists of three sections: the VLF sensor; the circuitry; the back-pack frame.

The VLF sensor consists of three orthogonal coils mounted in a cylindrical housing with a pre-amp signal circuitry. The coils consist of copper wire wound on a non-ferrous frame. These coils are mounted with two coils horizontal and one mounted vertically. The sensor housing is made of a ruggedized plastic material.

The VLF circuitry is housed in a ruggedized, and consists of three circuit boards.

The circuit boards contain a microprocessor, CPU circuitry, a tilt correction meter and signal filtering circuitry.

Both the VLF sensor and circuitry housings are attached to a rigid polyethylene frame.





## EQUIPMENT

REFERENCE: SCINTREX ENVI MAG BROCHURE

**Total Field Operating Range**  
20,000 to 100,000 nT (gammas)

**Total Field Absolute Accuracy:**  
±1 nT

**Sensitivity:**  
0.1 nT at 2 second sampling rate

**Tuning**  
Fully solid state. Manual or automatic, keyboard selectable

**Cycling (Reading) Rates**  
0.5, 1 or 2 seconds

**Gradiometer Option**  
Includes a second sensor, 1/2m (20 inch) staff extender and processor module.

**VLF Option**  
Includes a VLF sensor and harness assembly

**'WALKMAG' Mode**  
continuous reading, cycling as fast as 0.5 seconds

**Digital Display**  
LCD "Super Twist", 240 x 64 dots graphics, 8 line x 40 characters alphanumeric

**Display Heater**  
Thermostatically controlled, for cold weather operations

**Keyboard Input**  
17 keys, dual function, membrane type

**Notebook Function**  
32 characters, 5 user-defined MACRO's for quick entry

**Standard Memory**  
Total Field Measurements: 28,000 readings  
Gradiometer Measurements: 21,000 readings  
Base Station Measurements: 151,000 readings  
VLF Measurements: 4,500 readings for 3 frequencies

**Expanded Memory**  
Total Field Measurements: 140,000 readings  
Gradiometer Measurements: 109,000 readings  
Base Station Measurements: 750,000 readings  
VLF Measurements: 24,000 readings for 3 frequencies

**Real-Time Clock**  
Records full date, hours, minutes and seconds with 1 second resolution, ±1 second stability over 24 hours

**Digital Data Output**  
RS-232C interface, 600 to 57,600 Baud, 7 or 8 data bits, 1 start, 1 stop bit, no parity format. Selectable carriage return delay (0-999 ms) to accommodate slow peripherals. Handshaking is done by X-on/X-off. High speed Binary Dump. Selectable formats for easy interfacing to commercial software packages.

**Analog Output**  
0-999 mV full scale output voltage with keyboard selectable range of 1, 10, 100, 1000 or 10,000 full scale

**Power Supply**  
Rechargeable 'Camcorder' type, 2.3 Ah, Lead-acid battery  
12 Volts at 0.65 Amp for magnetometer, 1.2 Amp for gradiometer  
External 12 Volt input for base station operations  
Optional external battery pouch for cold weather operations

**Battery Charger**  
110 Volt-230 Volt, 50/60 Hz

**Operating Temperature Range**  
Standard: -40° to 60°C

**Dimensions & Weight**  
Console: 250mm x 152mm x 55mm (10" x 6" x 2.25")  
2.45 kg (5.4 lbs) with rechargeable battery

Magnetic Sensor: 70mm x 175mm (2.75" d x 7")  
1 kg (2.2 lbs)

Gradiometer Sensor: 70mm x 675mm (2.75" d x 26.5")  
(with staff extender) 1.15 kg (2.5 lbs)

Sensor Staff: 25mm x 2m (1" d x 76")  
.8 kg (1.75 lbs)

VLF Sensor Head: 140mm x 130mm (5.5" d x 5.1")  
.9 kg (2 lbs)

VLF Sensor: 280mm x 190mm x 75mm (11" x 7.5" x 3")  
1.7 kg (3.7 lbs)

**Options**  
Base Station Accessories Kit  
GPS  
Software Packages  
Training Programs

## SCINTREX

### SCINTREX



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## Results & Recommendations

Parameters recorded for this survey were the in-phase and out-of-phase. In VLF data, the in-phase and out-of-phase spikes refer to the relationship between the electric and magnetic fields of the secondary currents induced in conductive geologic units by the low-frequency electromagnetic signal transmitted from the surface of the earth. The in-phase component is the part of the signal where the electric and magnetic fields are in phase with each other, while the out-of-phase component is the part where they are out of phase. The in-phase and out-of-phase spikes can be used to analyze the subsurface structure and map mineralization. The in-phase component is used to identify the depth and conductivity of the subsurface structure, while the out-of-phase component is used to identify the orientation and shape of the subsurface structure.

The use of Geosoft's Oasis Montaj software was used to interpret the results of the in-phase & out-phase parameters. **Figure 3 & 4** represents a visual interpretation of the VLF results in the form of numerical postings and linear profiles.

Anomalous areas are identified within the survey data. Lines 10+900E to line 11+200E delineate a south-west to north-east trend. Further continuance of the VLF survey is recommended to cover the entire claim boundaries to the east and south; full coverage would only be possible during the winter months over lake ice.


The project expectations, survey and results were accomplished successfully although, further surveys should be conducted, including full VLF coverage during safe lake ice conditions. In addition to the VLF survey, magnetometer and gamma ray spectrometer readings with a tight

survey pattern is suggested to build a more comprehensive picture and distinction of potential conductive rare earth elements and radioactive uranium ore bodies.

### **Report Authors, Contributors & Qualifications**

C. Brent Patrie – 30+years Exploration & Geophysics Management

Gabriel Roy – 16+years Exploration & Geophysics, Mapping & Data Management



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C. Brent Patrie



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Gabriel Roy

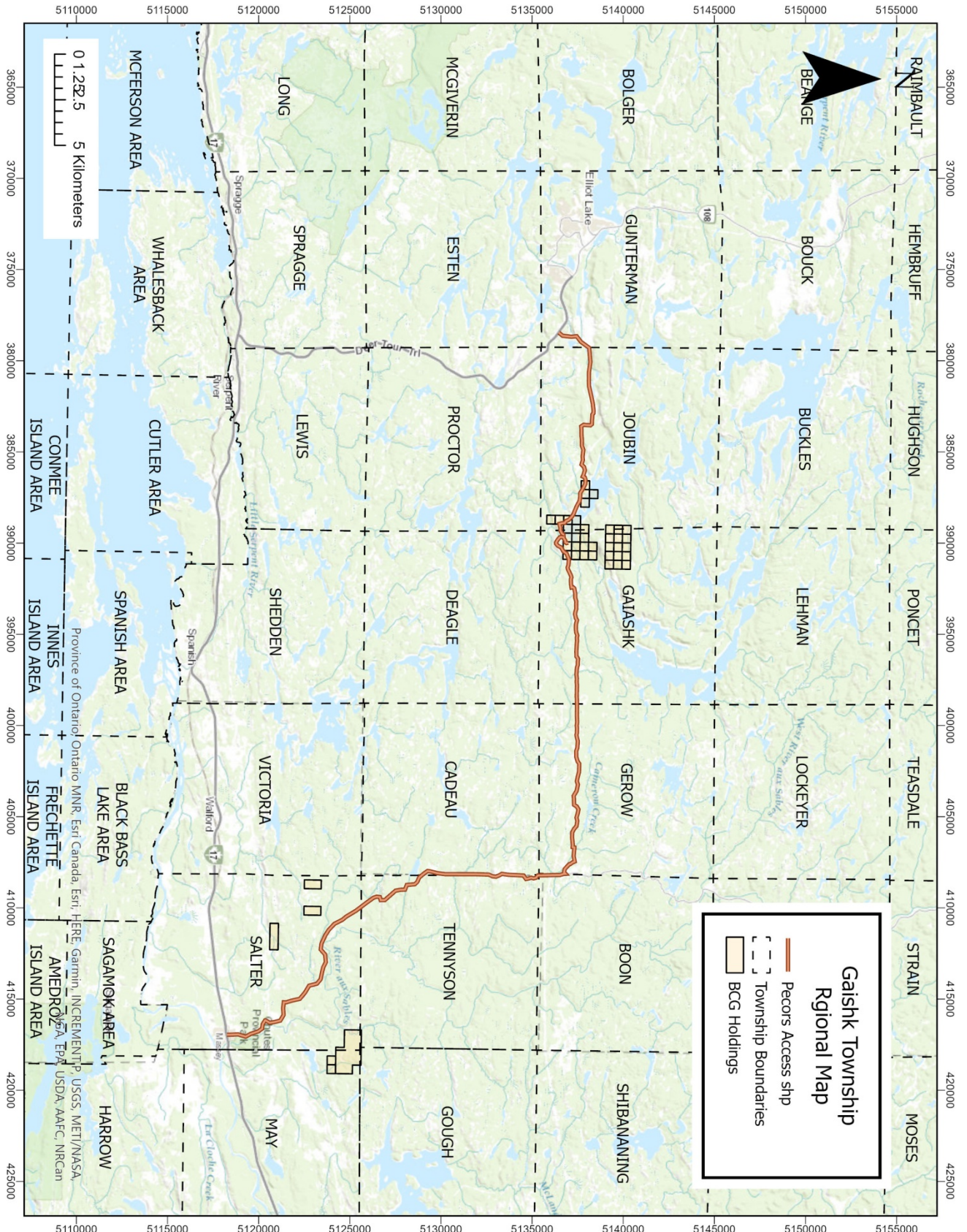
**August 28 2023 (Revision Date)**

Table 1 – Claim List & Holdings

Tenure ID	Anniversary Date	Work Required	Township / Area
119776	19-Jun-2023	200	JOUBIN, GAIASHK
129155	19-Jun-2023	400	GAIASHK
129156	19-Jun-2023	200	JOUBIN, GAIASHK
163679	19-Jun-2023	200	GAIASHK
192576	19-Jun-2023	200	GAIASHK
222486	19-Jun-2023	200	GAIASHK
222487	19-Jun-2023	200	GAIASHK
242639	19-Jun-2023	400	GAIASHK
259629	19-Jun-2023	400	GAIASHK
259630	19-Jun-2023	200	GAIASHK
278461	19-Jun-2023	200	GAIASHK
278462	19-Jun-2023	200	JOUBIN, GAIASHK
295687	19-Jun-2023	400	GAIASHK
336768	19-Jun-2023	400	GAIASHK
336769	19-Jun-2023	200	GAIASHK



Figure 1 – Regional & Access Map





**Figure 2 – Project Grid Map**

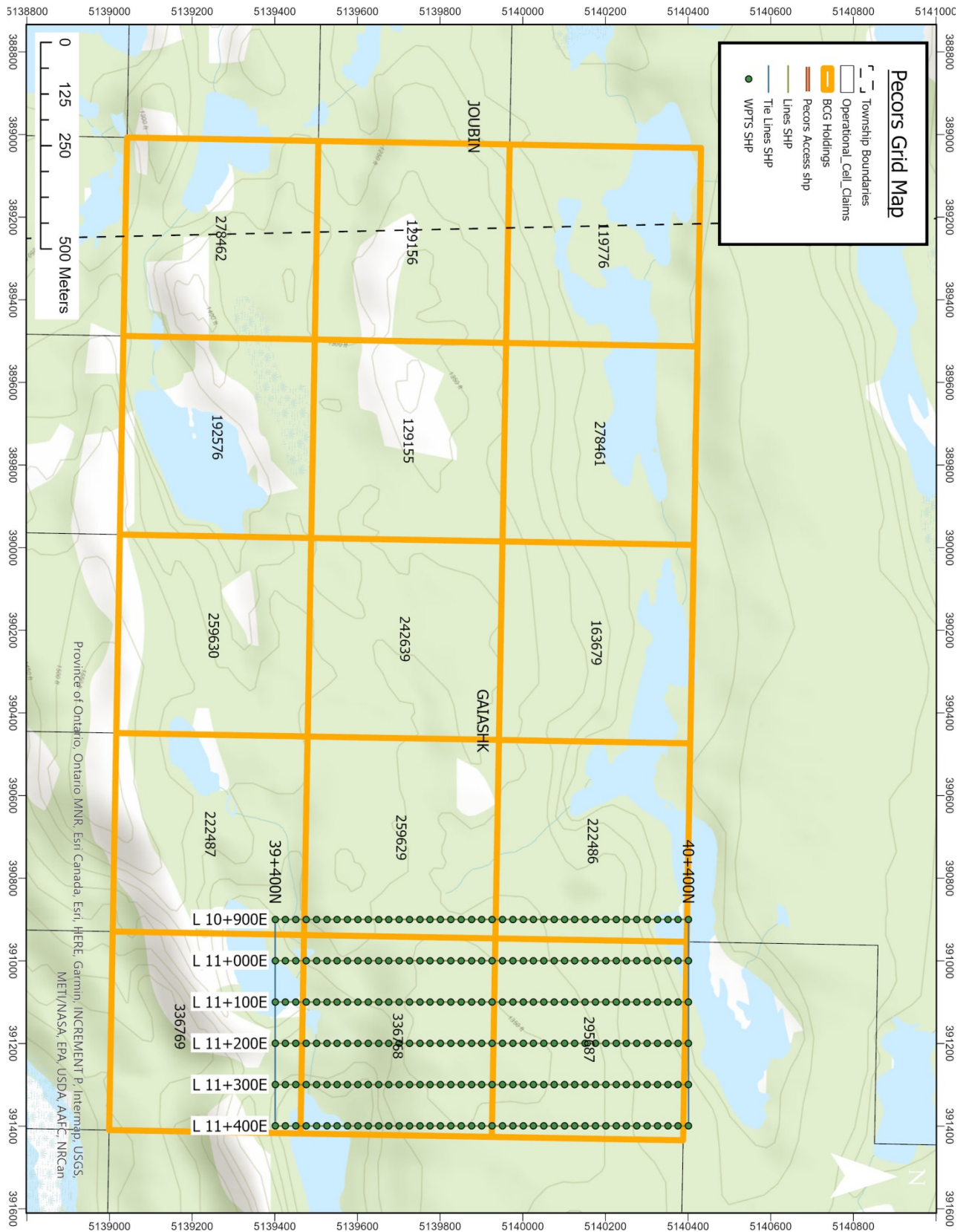
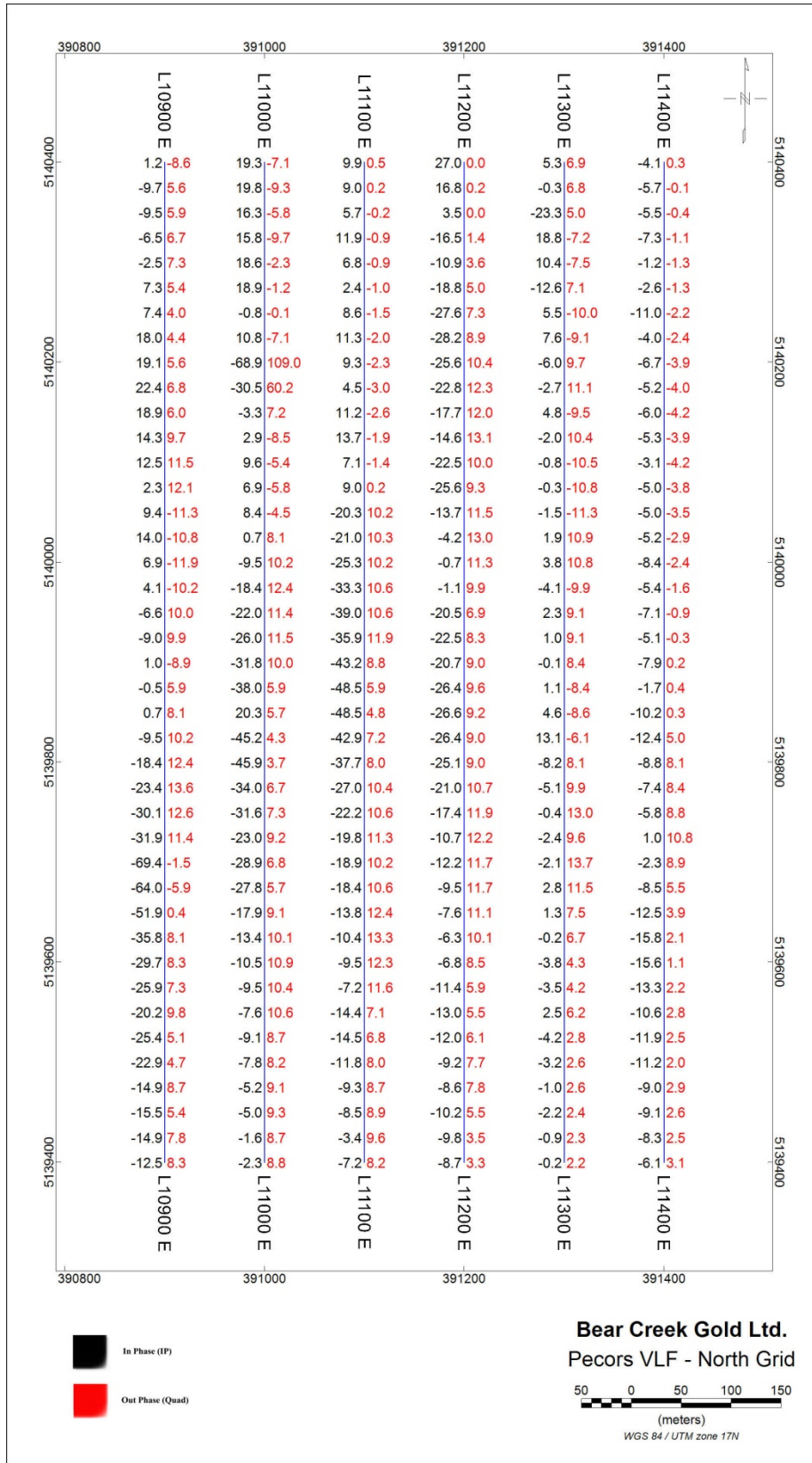


Figure 3 – VLF Result Postings



**Figure 4 – VLF Result Profile Interpretation**

