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MEMORANDUM

Date: December 23, 2022

From: Ross Polutnik, P.Geo, S.J.V. Consultants Ltd.

To: Chris Graf, VP Exploration, Bonanza Mining

SUBJECT: Interpretation of Volterra-3DIP Data on the Frog Property

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Introduction

At the request of Bonanza Mining Corporation, S.J.V. Consultants Ltd. carried out an interpretation of the Volterra 3D direct current and induced polarization (DCIP) data acquired on the Frog property in July and August of 2022.

The Frog property is located in north-central British Columbia and is situated 165 km east of the town of Dease Lake. The project is being explored for zinc-lead-silver-copper mineralization and is considered prospective for carbonate replacement, sediment hosted massive-sulphide, and porphyry deposits. Details concerning the property, claim status, historical exploration activities, and other topics normally associated with formal reports are not included in this memo. Please see Butler, 2021 for a detailed summary of the project and historical exploration work completed.

The Frog property hosts one BC MINFILE prospect, named 'Linda, West, Jackstone, Gorf', which is located within a broad cirque above treeline. Mineralization was first discovered in this cirque in the 1950's and consisted of galena and sphalerite boulders over a 180 m by 120 m area near the head of Halls Creek.

Geophysical Surveys

SJ Geophysics Ltd. acquired the Volterra-3DIP data on the Frog property in July and August of 2022. The 3DIP data was acquired on two survey grids, referred to as the Main and Infill grids (Figure 1). The Main grid consisted of 17 lines, spaced 200 m apart, with lengths from 400 m to 2000 m. The Infill grid was situated within the Main grid extent and consisted of 9 lines, spaced 100 m apart and 1000 m in length. Specifically the Infill grid covered the region from line 7300E to 8100E and stations 1650N to 2650N. The Main grid was surveyed first with the Infill grid surveyed second to achieve additional detail over the chargeability anomaly identified in the Main grid data.

The Volterra-3DIP data was acquired using a 3D modified offset pole-dipole configuration with 5-line acquisition sets and a customized diamond array. Five lines were operated on simultaneously with three transmission (current) lines and two receiving lines in an alternating pattern. The electric dipoles were arranged in a diamond array. For the Main grid, each diamond had dimensions of 100 m by 50 m in the in-line and cross-line directions respectively, for an effective dipole length of 112 m. For the Infill grid, each diamond had dimensions of 50 m by 50 m in the in-line and cross-line directions respectively, for an effective dipole length of 71 m. Current injections occurred along each current line every 100 m on the Main grid and every 50 m on the Infill grid. Additional survey and instrumentation details can be found in the logistics report for the survey (Chen, 2022).

The 3DIP data was inverted using the UBC-GIF DCIP3D inversion modelling software with 3D inversion models generated for resistivity and chargeability. The 3DIP data acquired on the Main and Infill survey grids was merged together and inverted as a single data set. For the merged inversion model the cell size was 30 m in the x and y directions. The Infill grid data was also inverted individually utilizing a model cell size of 20 m in the x and y directions for quality control purposes. The BC TRIM 20k 10 m resolution DEM was utilized for the inversion modelling.

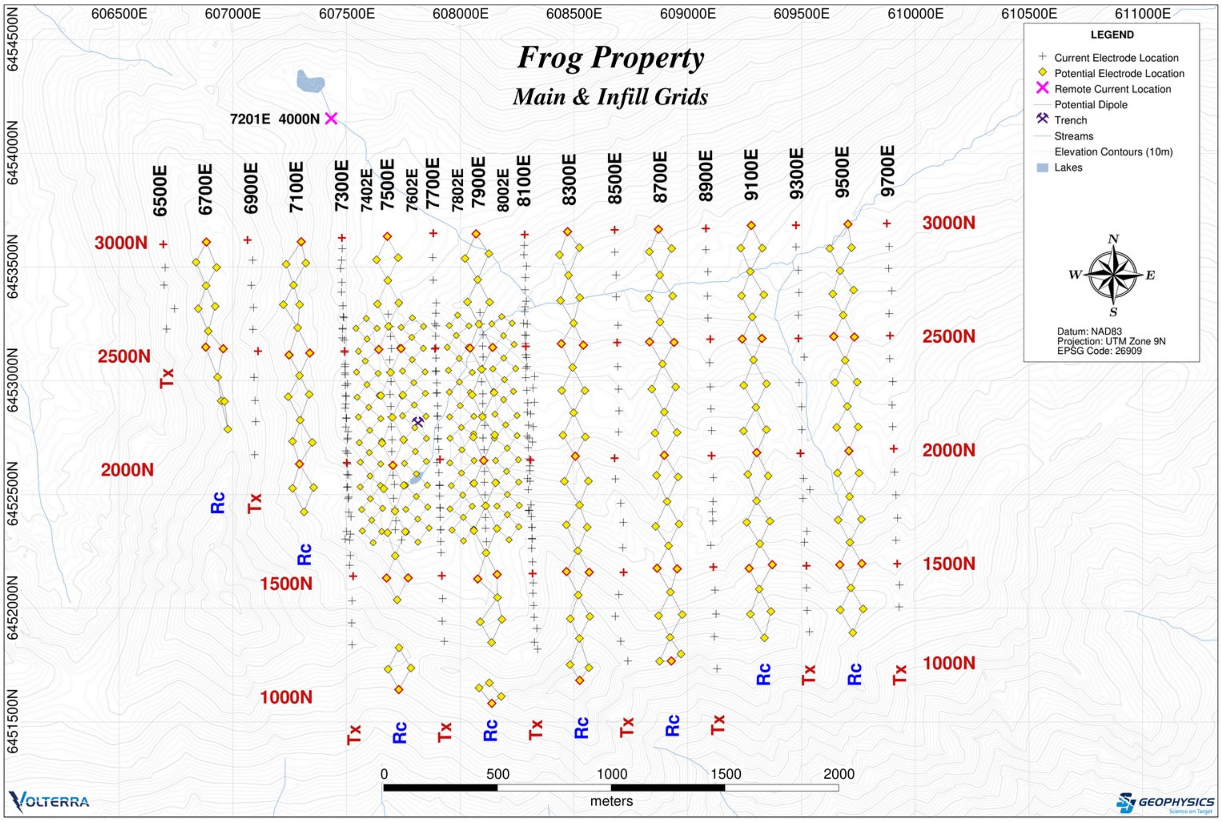

Figure 1: Volterra-3DIP survey grids (Main & Infill) on the Frog property

Interpretation

The Volterra-3DIP data was interpreted through a combination of 2D plan colour contour maps and 3D inversion models. The 3D inversion models were integrated together with available topographic and geologic data into a 3D visualization session using the open-source software ParaView[1].

The Frog property sits within a northwest trending belt of metasedimentary and metavolcanic rocks of the Ingenika Group (Butler, 2021) as shown in Figure 2. The property is fault bounded by two northwest striking regional faults, the Kechika Fault to the northeast and the Thudaka Fault to the southwest. Adjacent to the Thudaka Fault is the Cretaceous Thudaka Pluton, comprised of granodiorite and quartz monzonite, which intrudes into the Ingenika Group and underlies the southwest corner of the Frog property.

1 https://www.paraview.org/

Property scale geologic mapping was completed in the summer of 2022 by Bonanza Mining following the 3DIP survey. The Frog Volterra-3DIP survey grid overlain on the reconnaissance property geology map is shown in Figure 3.

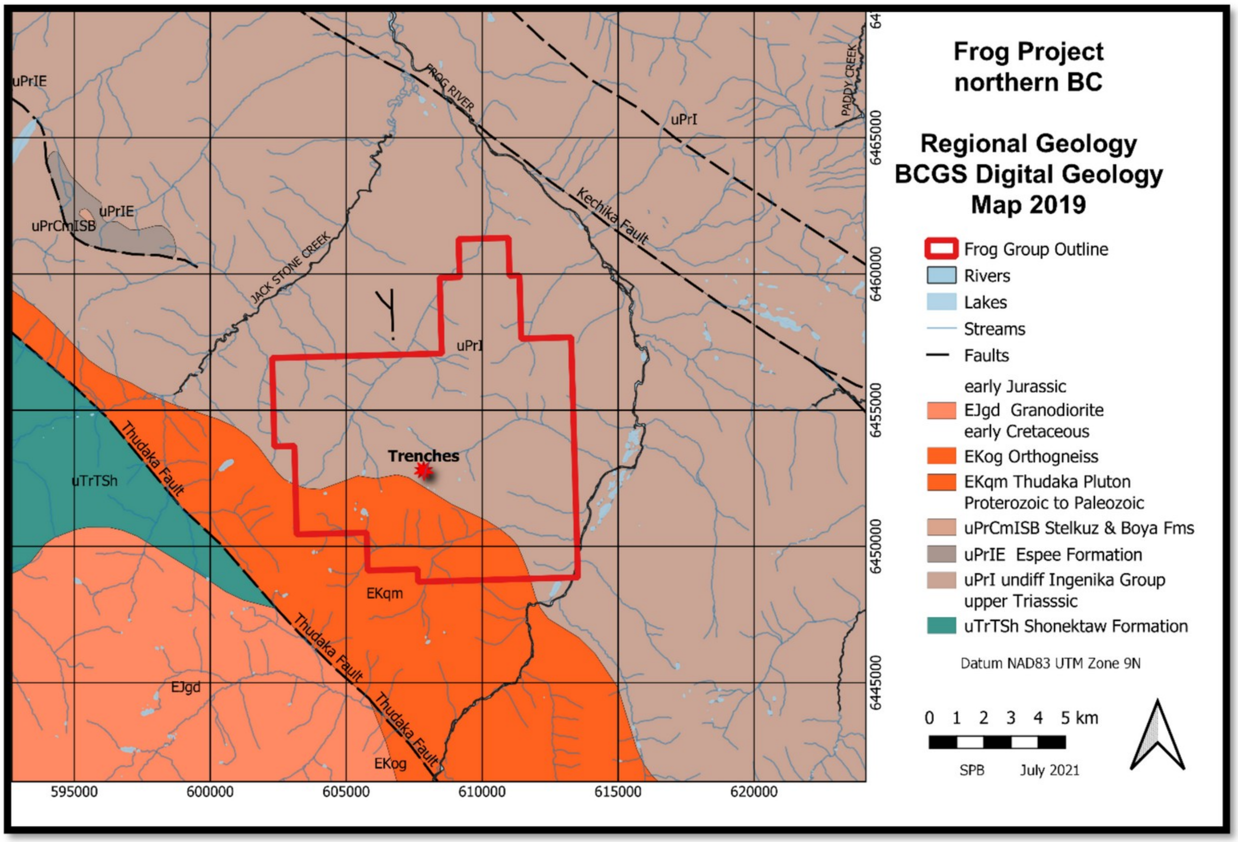

Figure 2: Frog property and regional geology (From Butler, 2021)

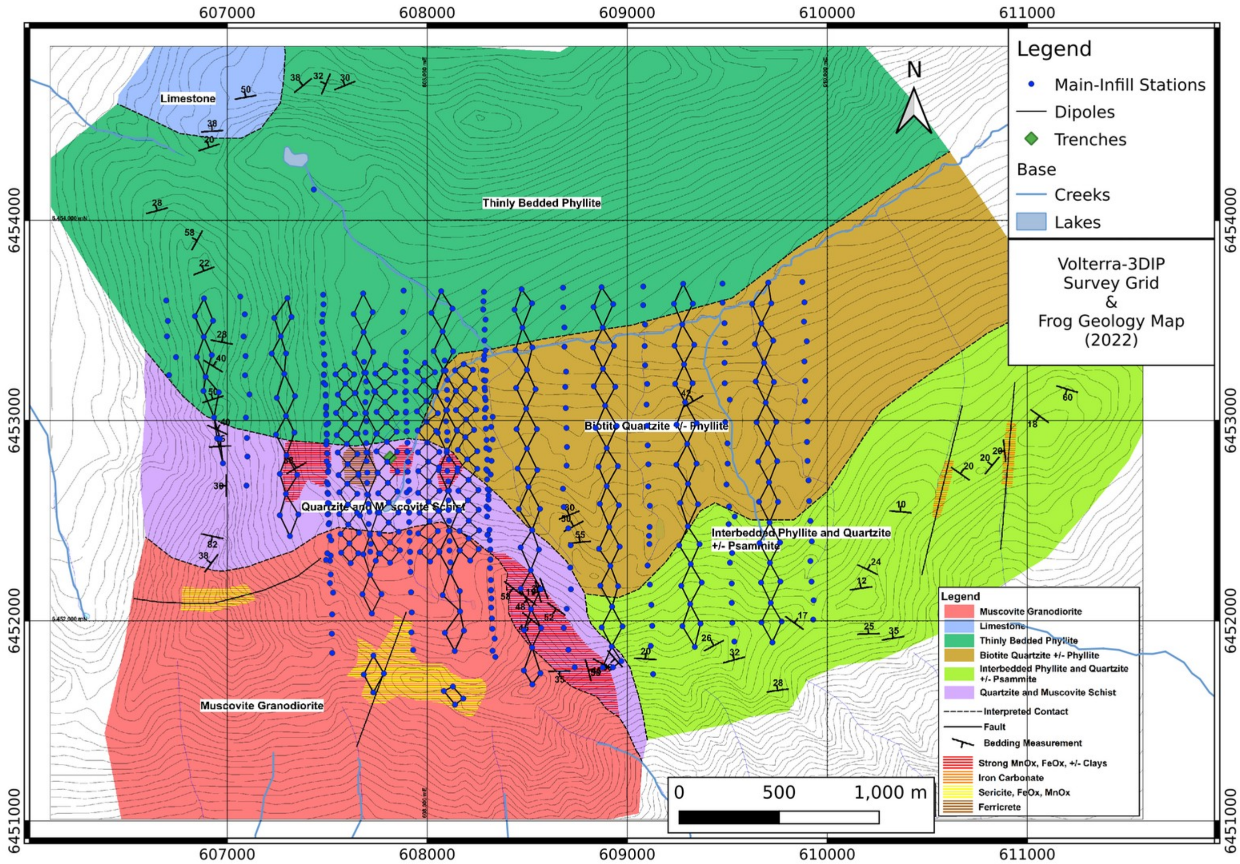

Figure 3: Volterra-3DIP survey grid and Frog property geology (reconnaissance)

Resistivity Model

The resistivity model exhibits a relatively large range of amplitudes with values ranging from less than 20 ohm.m to greater than 15,000 ohm.m. In the near-surface, the highest amplitude resistivity values are observed near the head of Halls Creek and specifically to the northeast and southwest of the historical trenches. There is an overall northeast-southwest orientation with multiple linear high resistivity bodies observed. The linear high resistivity bodies may reflect resistive dykes that have been noted to be present within the upper Halls Creek drainage. Slices from the inversion model at depths of 50 m and 150 m below topography are shown in Figures 4 and 5.

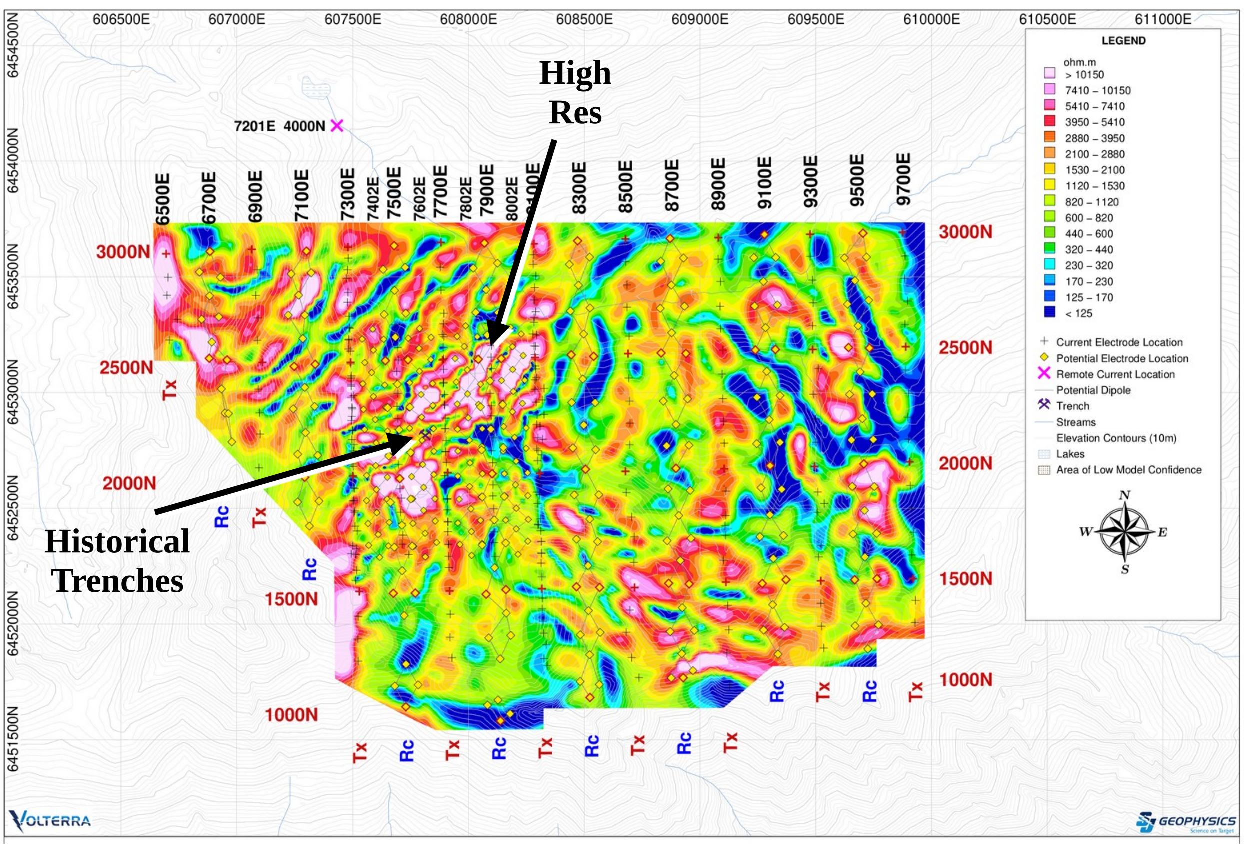

Figure 4: Resistivity 3D inversion model @ 50m depth below topography (plan view)

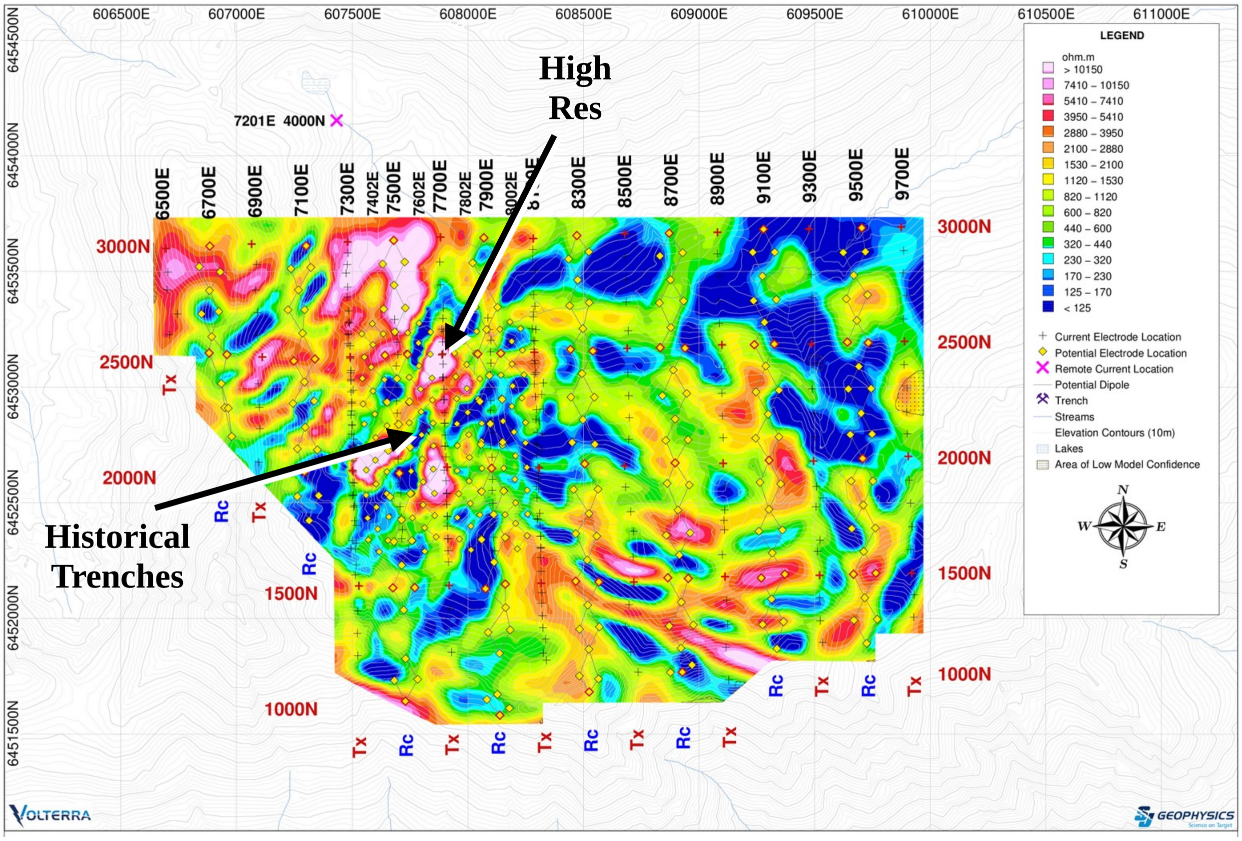

Figure 5: Resistivity 3D inversion model @ 150m depth below topography (plan view)

There are two main lineaments/structures observed in the resistivity inversion model (Figure 6). The first is a northwest-southeast oriented structure crossing the southwestern side of the survey grid. The second is a northeast oriented structure located on the northwest side of Halls Creek and that appears to bound the high resistivity surface anomaly on its northwest side.

There is a possible north-south oriented structure crossing through the centre of the survey grid that appears to truncate the high resistivity surface body on its east side. There is some uncertainty with regards to this structure as it occurs near the boundary between the infill grid and the main grid. The feature should be investigated further to determine if there is geological support for it.

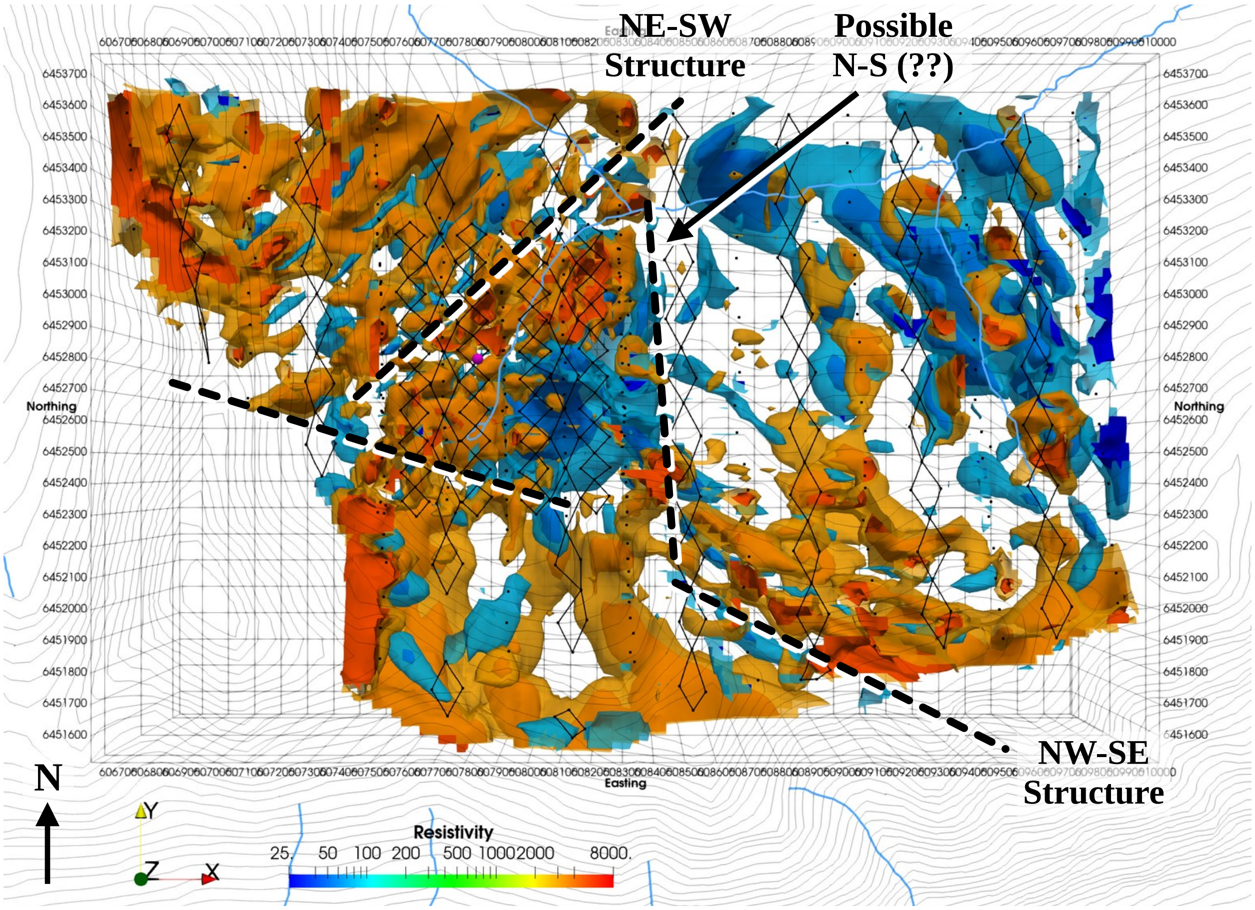

Figure 6: Resistivity 3D inversion model. High & low resistivity iso-surfaces. Plan View.
3D Iso-surfaces @ 20, 75, 3000, and 5000 ohm.m

Comparison of the resistivity inversion model with the project geology (reconnaissance) map is shown in Figure 7. There are a number of trends observed as well as differences in the "character" or "fabric" of the resistivity response across the survey grid.

- Mapped biotite quartzite unit (beige) generally corresponds to lower resistivity rocks. Appear to primarily have a north to northwest orientation.
- Mapped thinly bedded phyllite unit (dark green) generally corresponds to moderate and higher resistivity rocks. Appear to primarily have a northeast orientation.
- Mapped interbedded phyllite and quartzite unit (light green) generally corresponds to moderate resistivity rocks (~2000 ohm.m) with higher resistivity values observed along the south edge of the survey grid. Appear to primarily have a northwest orientation.

- Mapped muscovite granodiorite unit has a varied response. It is generally moderately resistive (~2000 ohm.m) with higher resistivities (~3000 ohm.m) at depth. No obvious orientation is observed.

On the northeast side of the survey grid, within the mapped biotite quartzite unit, there is a northwest oriented, curving (counterclockwise), low resistivity body at a depth from approximately 150-350 m. There is a second smaller, sub-parallel, low resistivity body located approximately 500 m to the southwest. Both are annotated in Figure 7 as solid black lines.

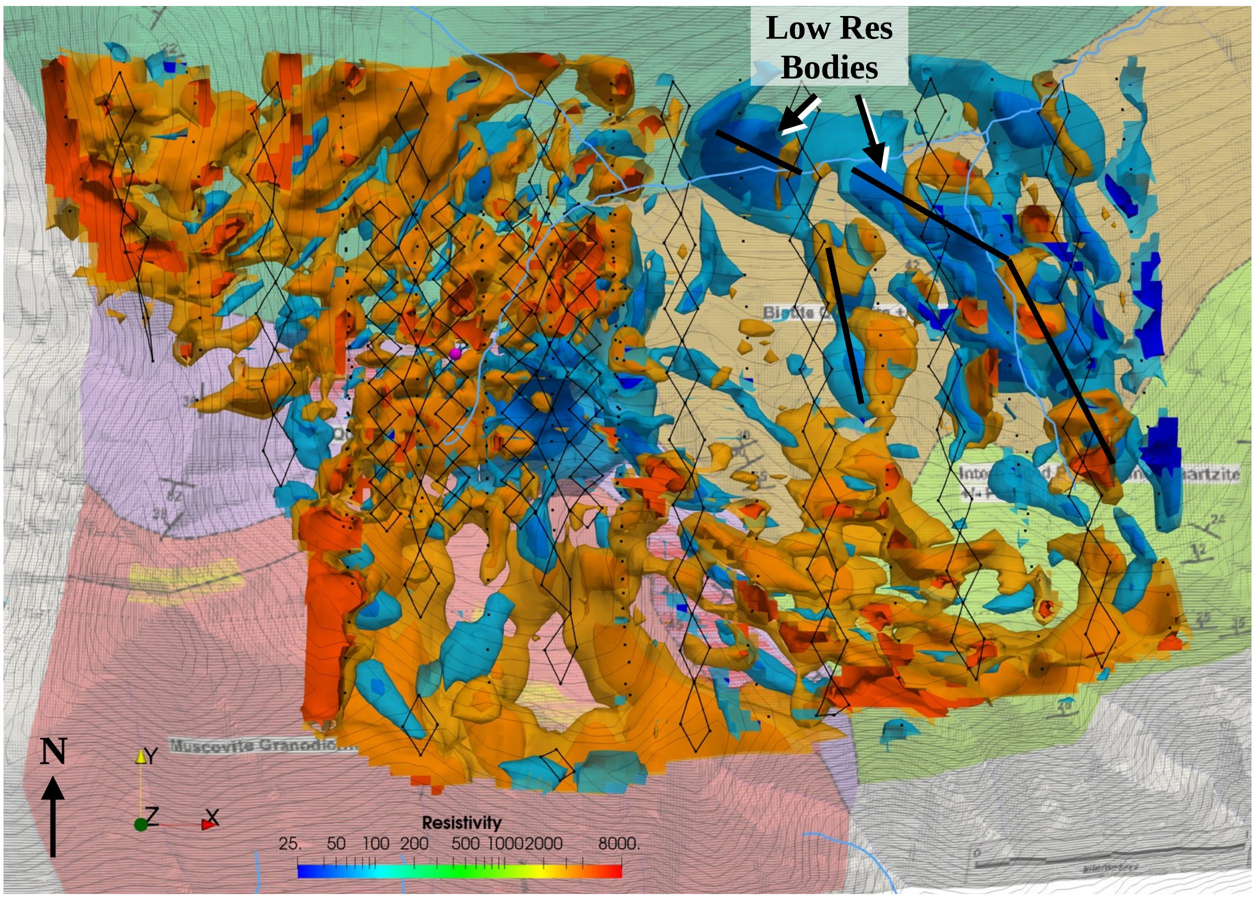

Figure 7: 3D Resistivity iso-surfaces and Frog property geology (reconnaissance). Plan View.
3D Iso-surfaces @ 20, 75, 3000, and 5000 ohm.m

Located at depth, on the east side of Halls Creek near the historical trenches, are two very low resistivity, sub-vertical bodies (Figures 8, 9, and 10). The south body is oriented east-west and is approximately 300 m in length along strike and dips toward the south. It has a depth extent from approximately 175 m to 600 m below surface. The north body is oriented north-south and is approximately 200 m in length along strike. It has a depth extent from approximately 200 m to 550 m below surface. Both low resistivity bodies abut the interpreted north-south oriented structure on their east sides.

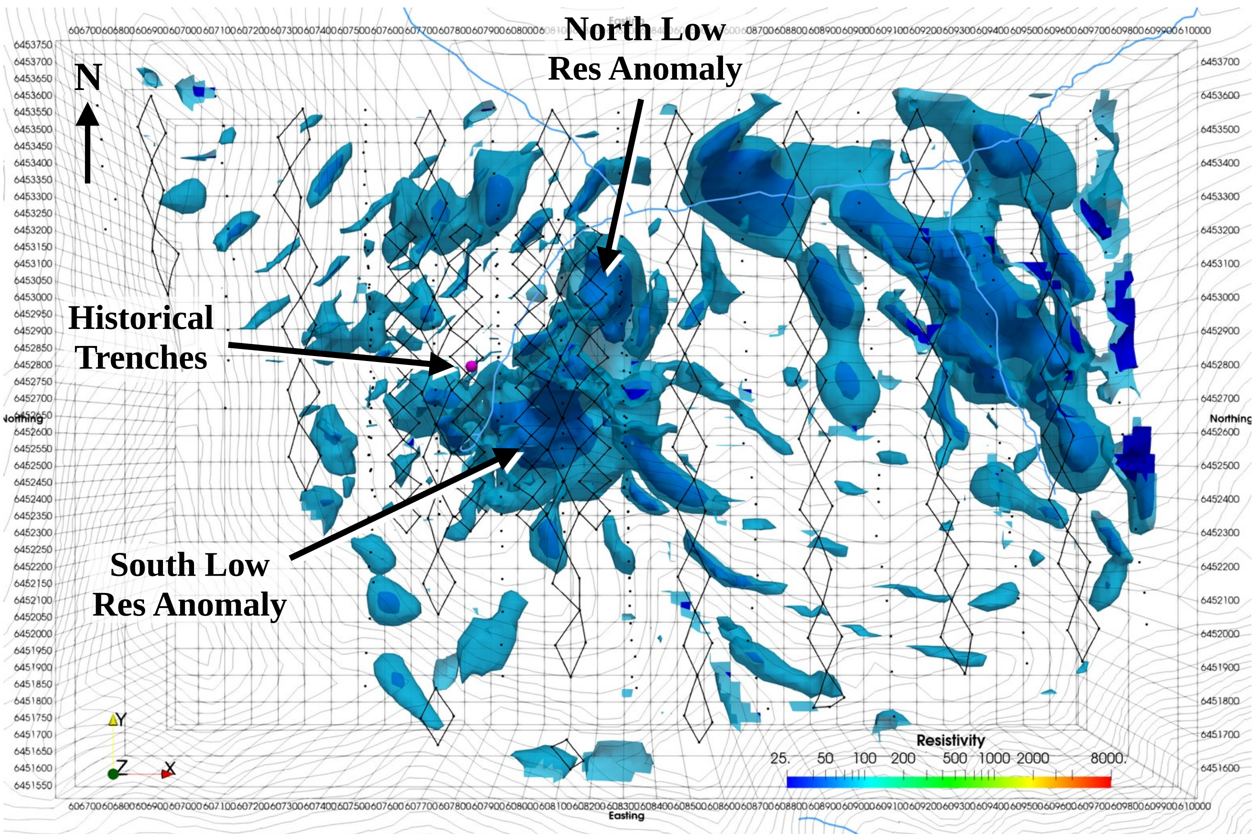

Figure 8: Resistivity 3D inversion model. Low Resistivity iso-surfaces. Plan View.
3D Iso-surfaces @ 20, 75 ohm.m

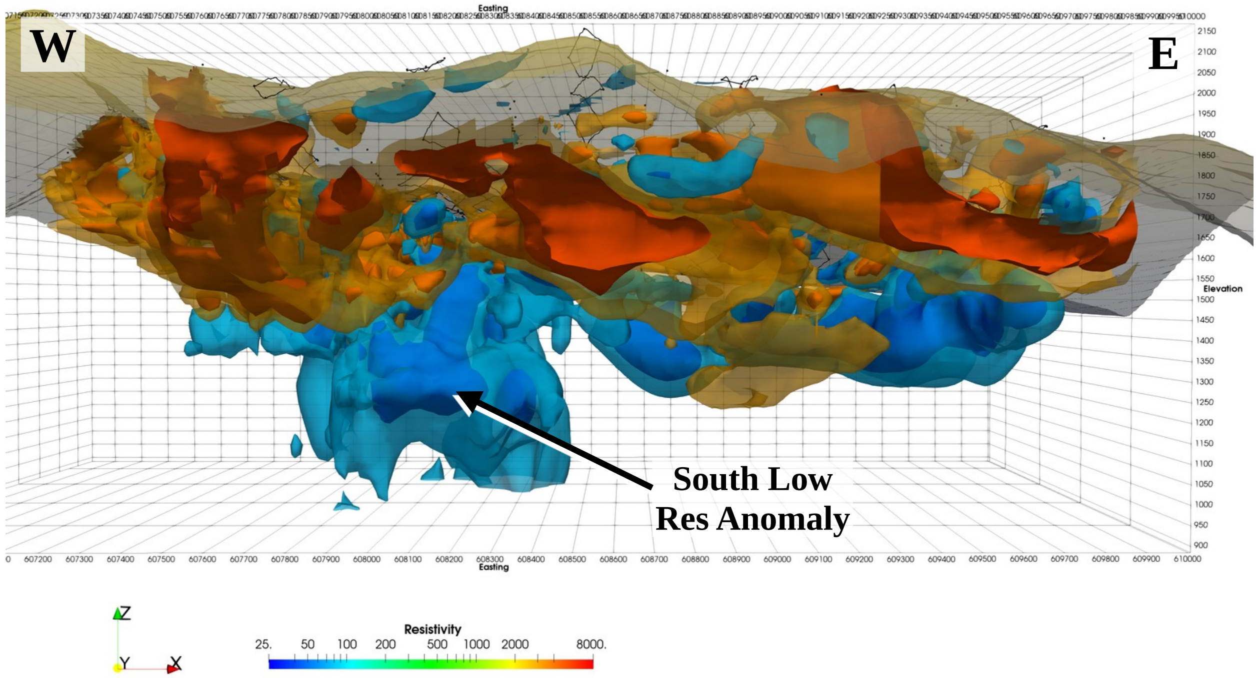

Figure 9: Deep Low Resistivity Anomaly – 3D Resistivity iso-surfaces. E-W Section view looking north.

3D Iso-surfaces @ 20, 75, 2000, 5000 ohm.m

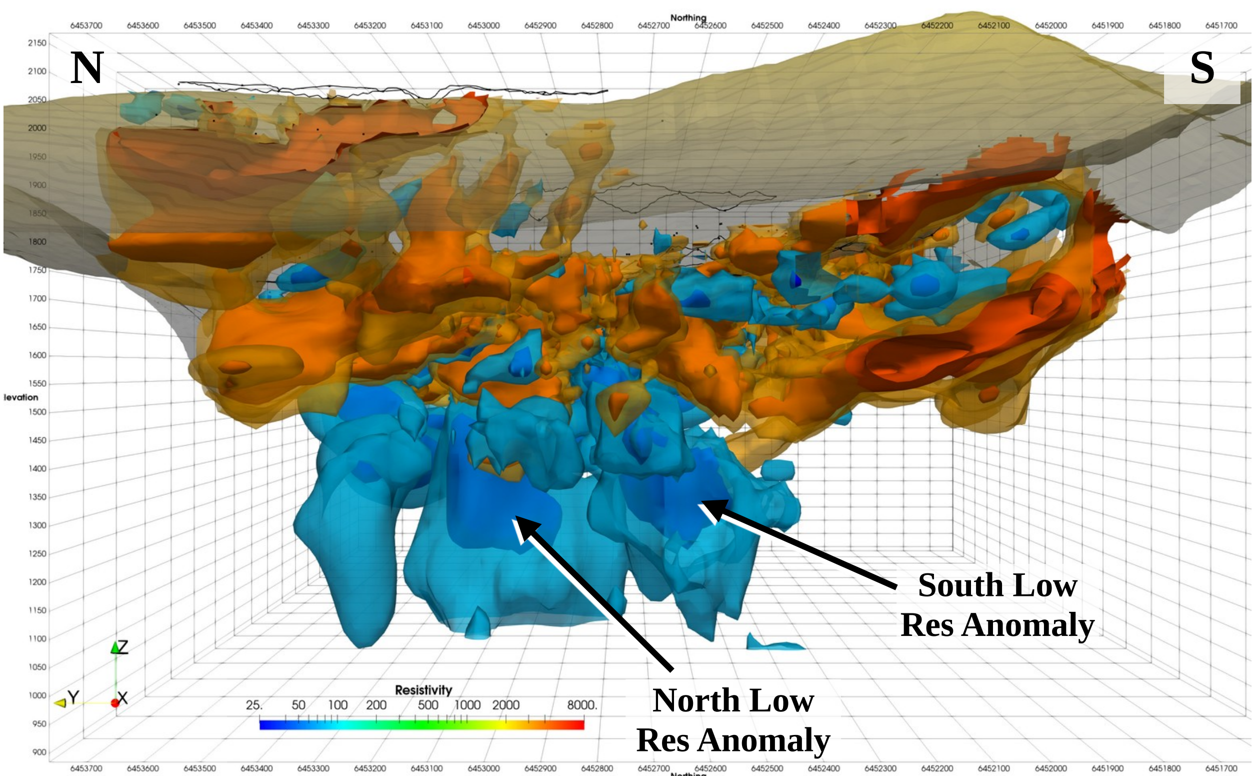

Figure 10: Deep Low Resistivity Anomaly – 3D Resistivity iso-surfaces. N-S Section view looking east.

3D Iso-surfaces @ 20, 75, 2000, 5000 ohm.m

Chargeability Model

The chargeability model shows a very clear northwest-southeast oriented boundary between generally high chargeability rocks to the northeast and lower chargeability rocks to the southwest (Figure 11). This boundary is present throughout the model at all depths and is clearly illustrated when viewing the 3D chargeability iso-surfaces, suggesting it may actually represent a structure. There is evidence of a possible north-south cross-cutting structure in the centre of the survey grid that appears to offset the northwest-southeast oriented boundary/structure (Figure 12). There is some uncertainty with regards to this possible structure as it occurs on the boundary between the infill grid and the main grid and may be overemphasized in the inversion. The feature should be investigated further to determine if there is geological support for it.

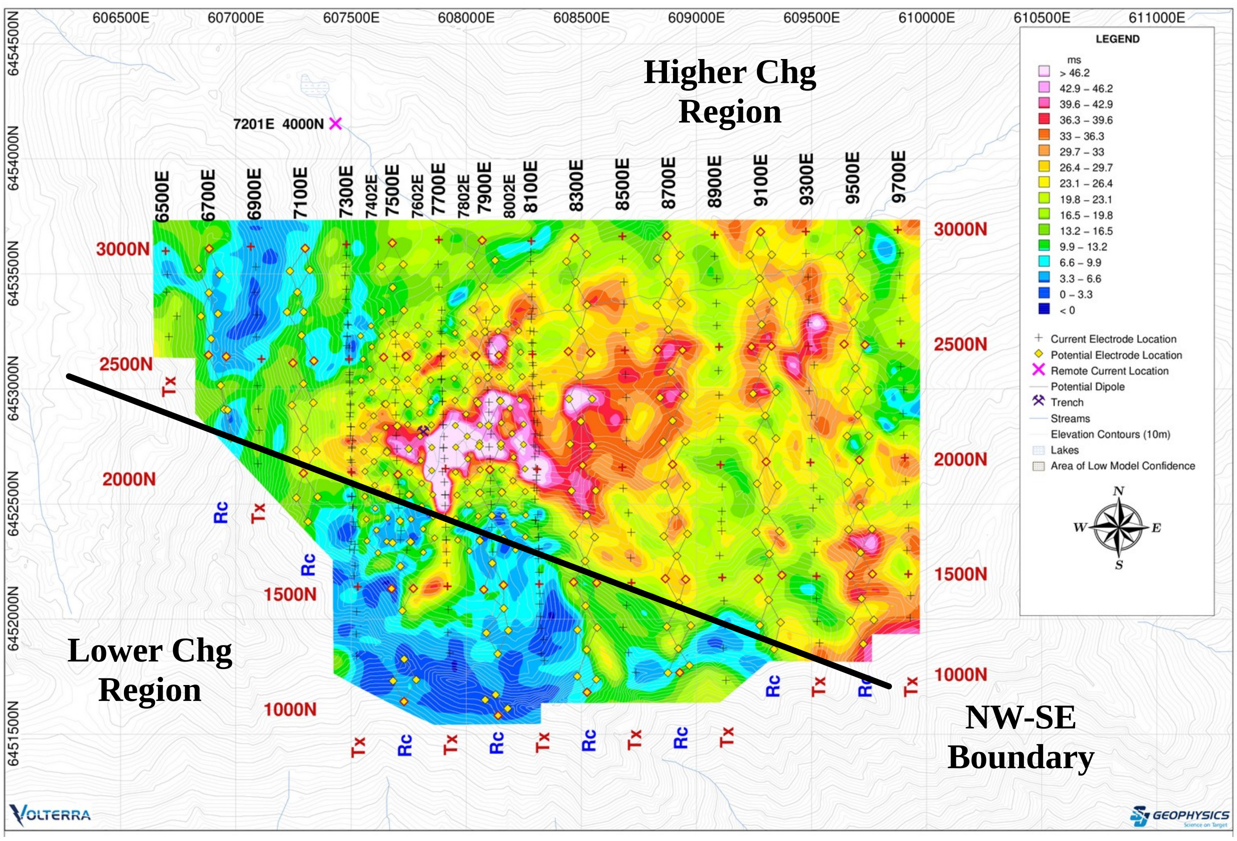

Figure 11: Chargeability @ 25m depth below topography (plan view)

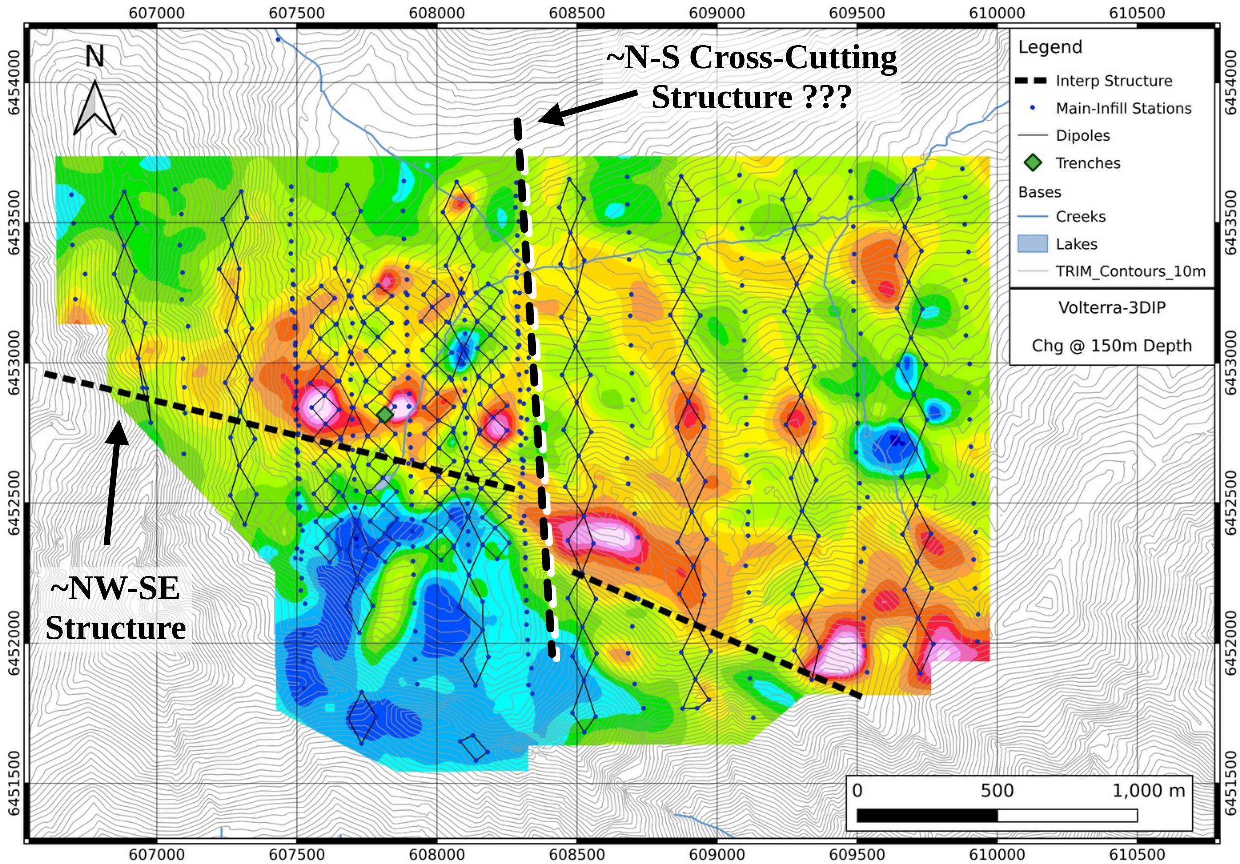

Figure 12: Chargeability @ 150m depth below topography (plan view).

Multiple northeast oriented lineaments and/or structures are observed in the 3D chargeability inversion model (Figure 13). These lineaments/structures tend to bound areas of high chargeability response. Notably, there is a northeast structure located adjacent to and on the northwest side of the historical trenches. The strongest near-surface chargeability response is situated adjacent to and on the south side of this structure.

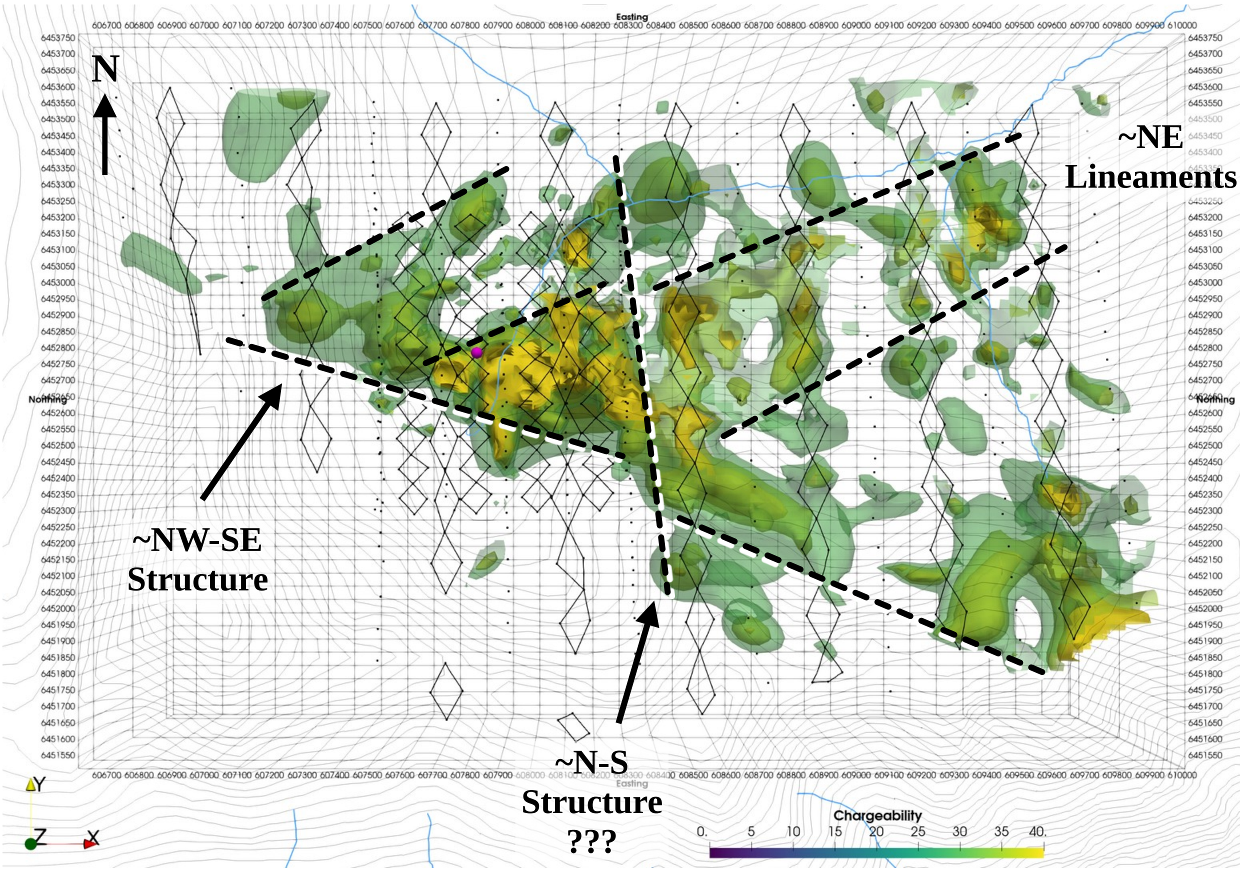

Figure 13: Interpreted chargeability lineaments and structures. 3D Chargeability model, plan view. 3D Iso-surfaces @ 30, 35, 40, 45, 50 ms

On the southwest side of the NW-SE structure, there is a zone of low chargeability (<10 ms) observed to be coincident with the known granodiorite intrusive. The boundary of this low chargeability zone closely follows the mapped contact between the intrusive and schists to the northeast (Figures 14 and 15).

The 3D chargeability model is shown with the property geology map in Figure 16. The strongest chargeability response is observed to occur within the quartzite and muscovite schist unit near the contact with the biotite quartzite unit and thinly bedded phyllite unit.

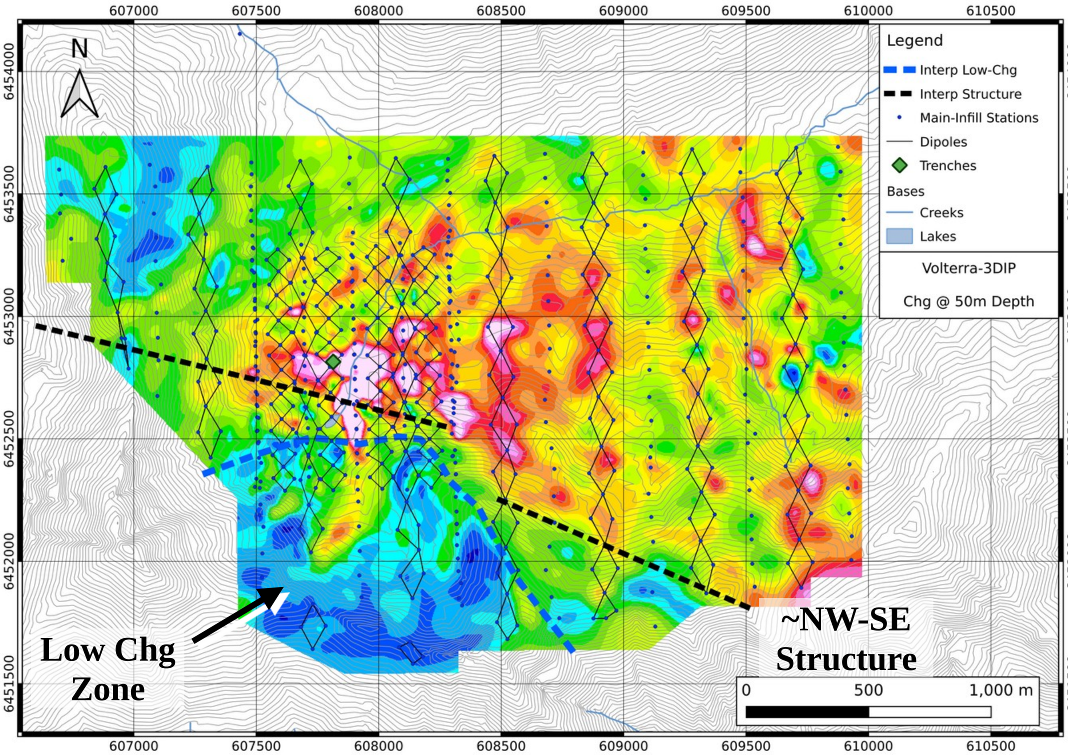

Figure 14: Chargeability @ 50m depth. Zone of low chargeability (dashed blue line).

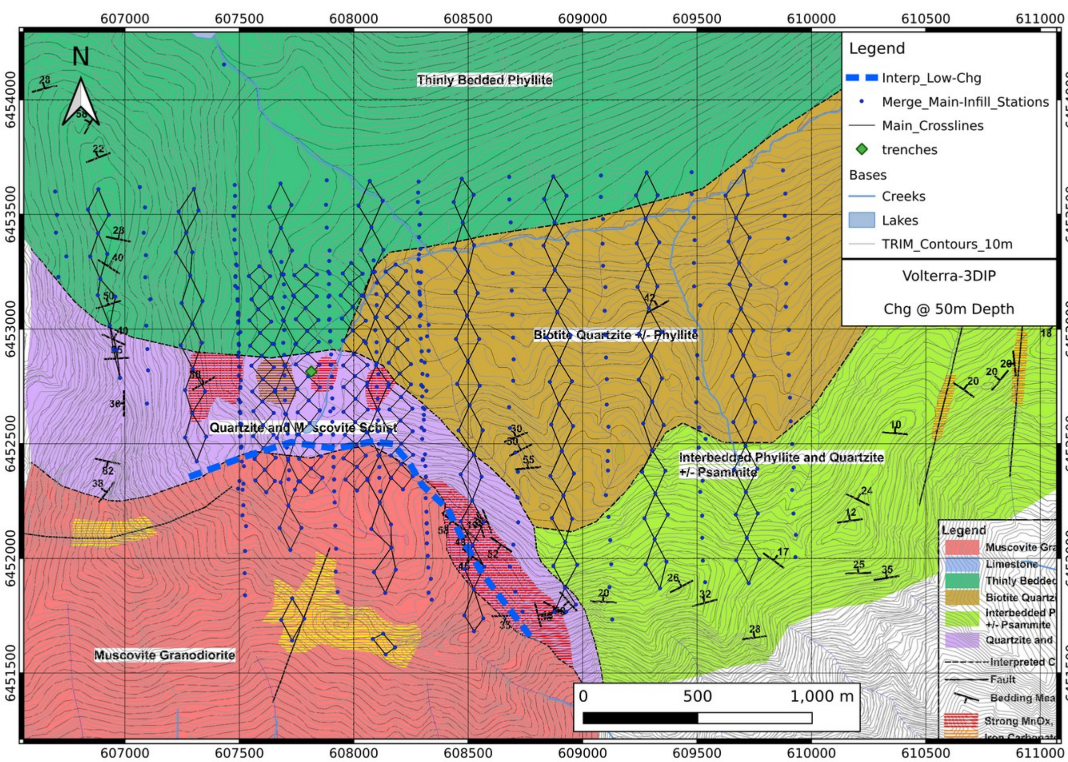

Figure 15: Zone of low chargeability (dashed blue line) overlain on property geology map

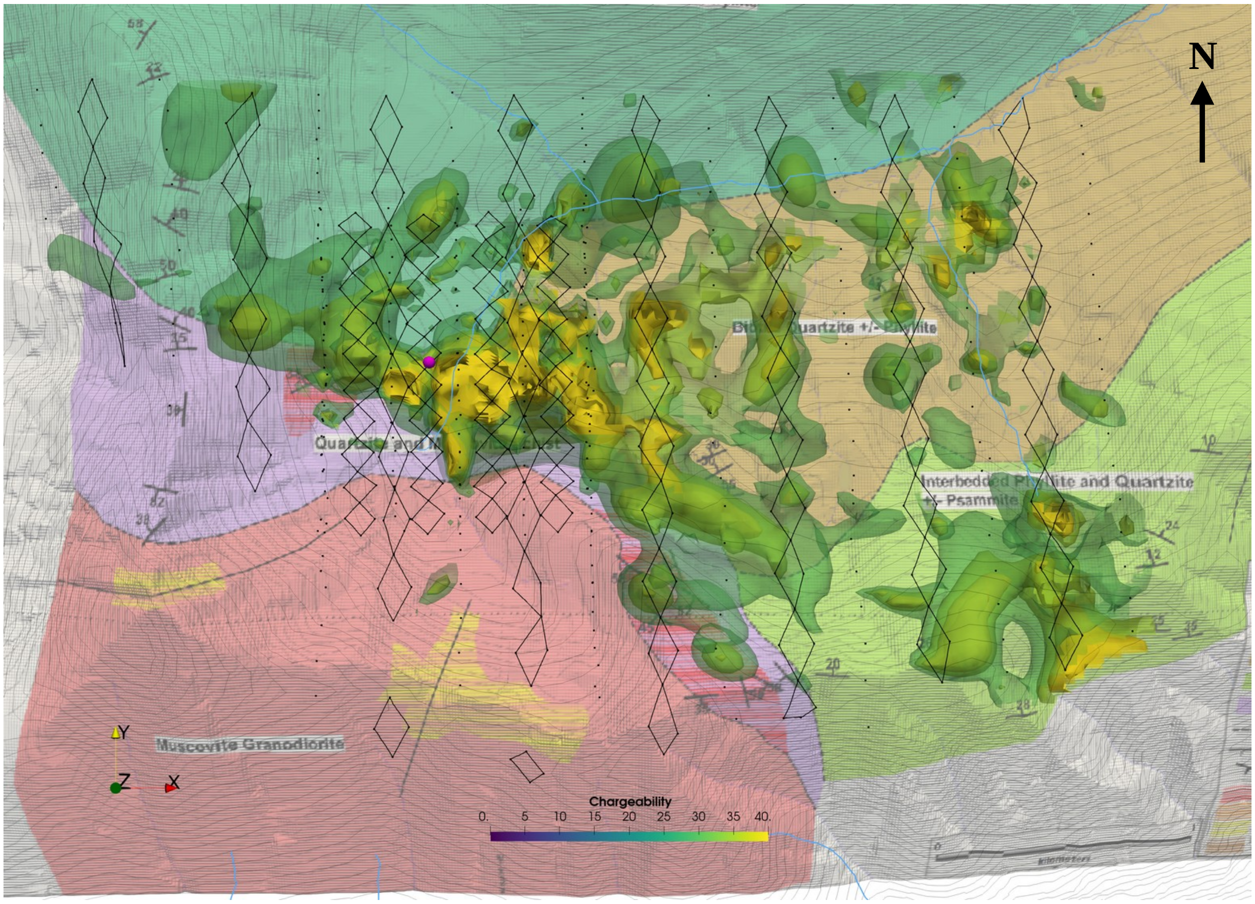

Figure 16: 3D Chargeability iso-surfaces and Frog property geology (reconnaissance)

There are two main chargeability anomalies observed on the survey grid and will be referred to as the central and southeast anomalies (Figure 17).

The central anomaly has the highest amplitude chargeability response on the grid. It is situated within the centre of the grid near the headwaters of Halls Creek and has an overall northeast orientation (Figure 18). At surface, the anomaly covers an area approximately 550 m by 250 m. The highest amplitude response is concentrated in the top 60 m as defined by the 50 ms iso-surface. High amplitudes up to 65 ms are observed at surface along Halls Creek. The north edge of the chargeability anomaly, coincident with the historical trenches, extends to a depth of approximately 150 m as defined by the 40 ms iso-surface.

Below the surface response of the central anomaly is a deep moderate-high amplitude chargeability anomaly defined by the 35 and 40 ms iso-surfaces. The anomaly is near vertical and extends from surface to approximately 580 m depth. The anomaly's east side appears to abut the interpreted north-south structure cross-cutting the survey grid. The chargeability anomaly is approximately 400 m in length (east-west) and 100-150m in width (north-south). The anomaly is widest in the east and narrows towards the west. This anomaly is shown in Figures 19 and 20. There is a second chargeability anomaly at depth to the northwest of the historical trenches, approximately 500 m northwest of the central deep anomaly. This anomaly has a vertical plug like shape and is located at a depth of 80 m to 300 m.

The southeast chargeability anomaly is located in the southeast corner of the survey grid. The anomaly is defined by the 35 ms iso-surface and consists of two bodies. The east body has the highest amplitude and is observed to be open to the south and east.

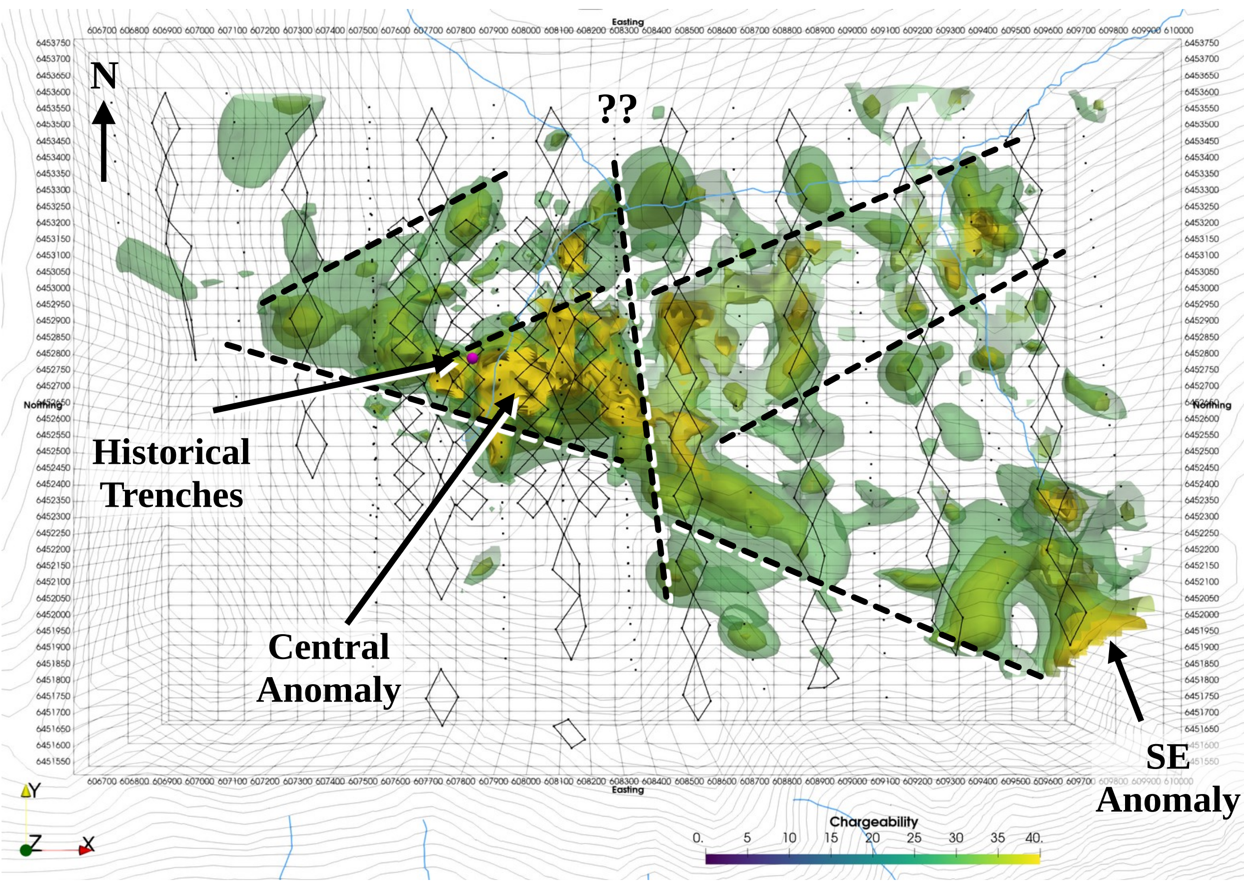

Figure 17: Chargeability 3D inversion model iso-surfaces. Plan View. Anomaly Zones.
3D Iso-surfaces @ 30, 35, 40, 45, 50 ms

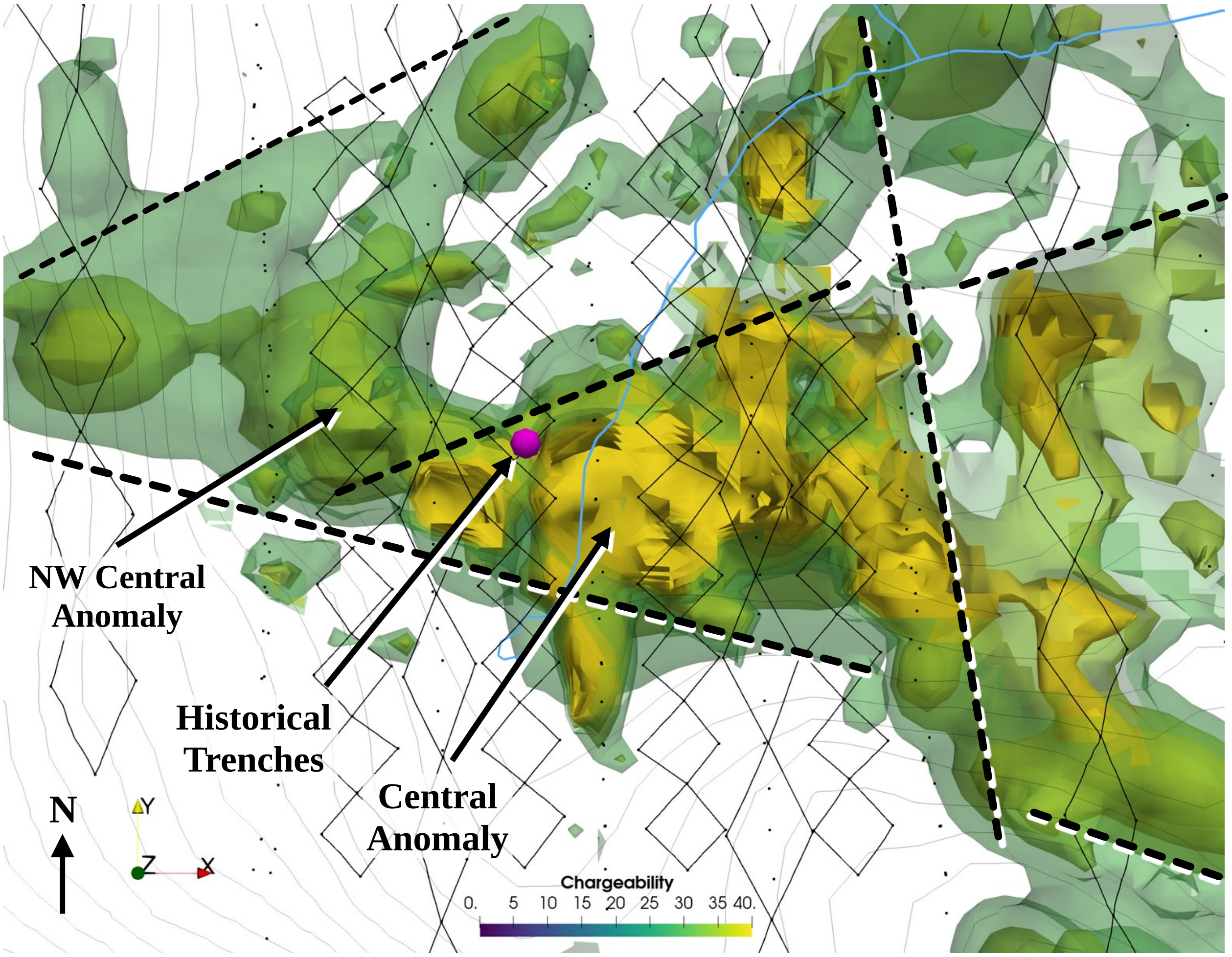

Figure 18: Detail view of Central Anomaly. Chargeability 3D inversion model iso-surfaces (Plan View).

3D Iso-surfaces @ 30, 35, 40, 45, 50 ms

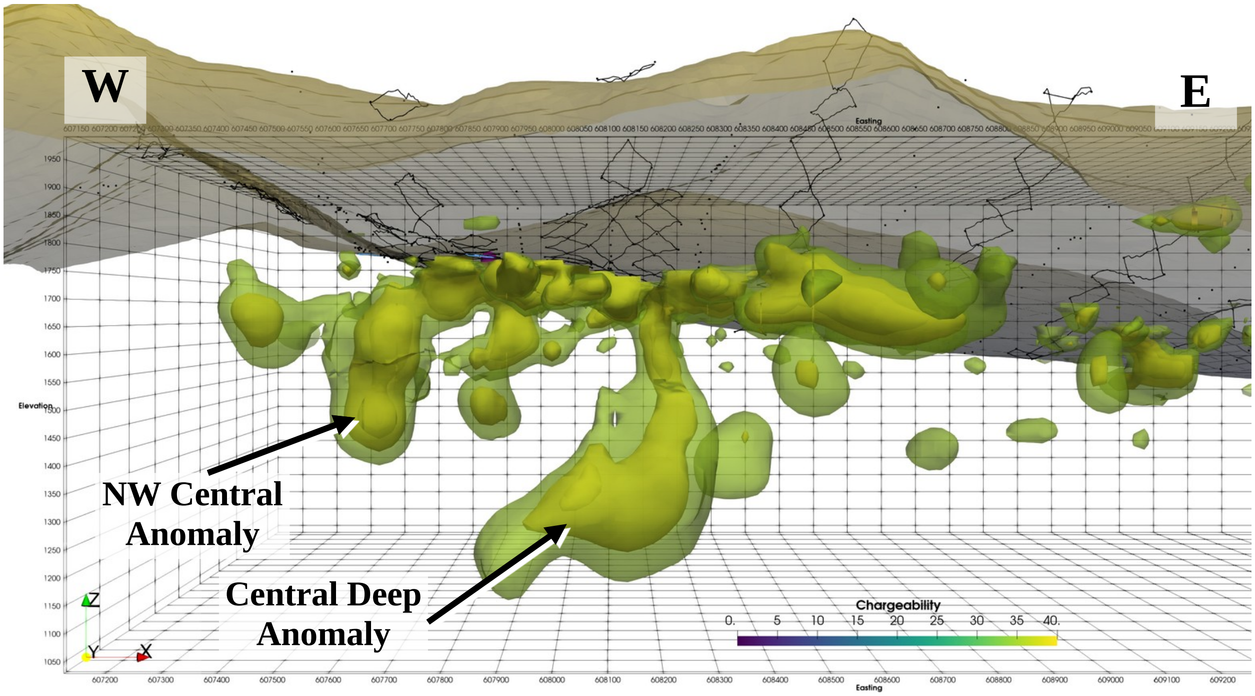

Figure 19: Central Deep Anomaly – 3D Chargeability iso-surfaces. Section view looking north.

3D Iso-surfaces @ 35, 40, 45, 50 ms

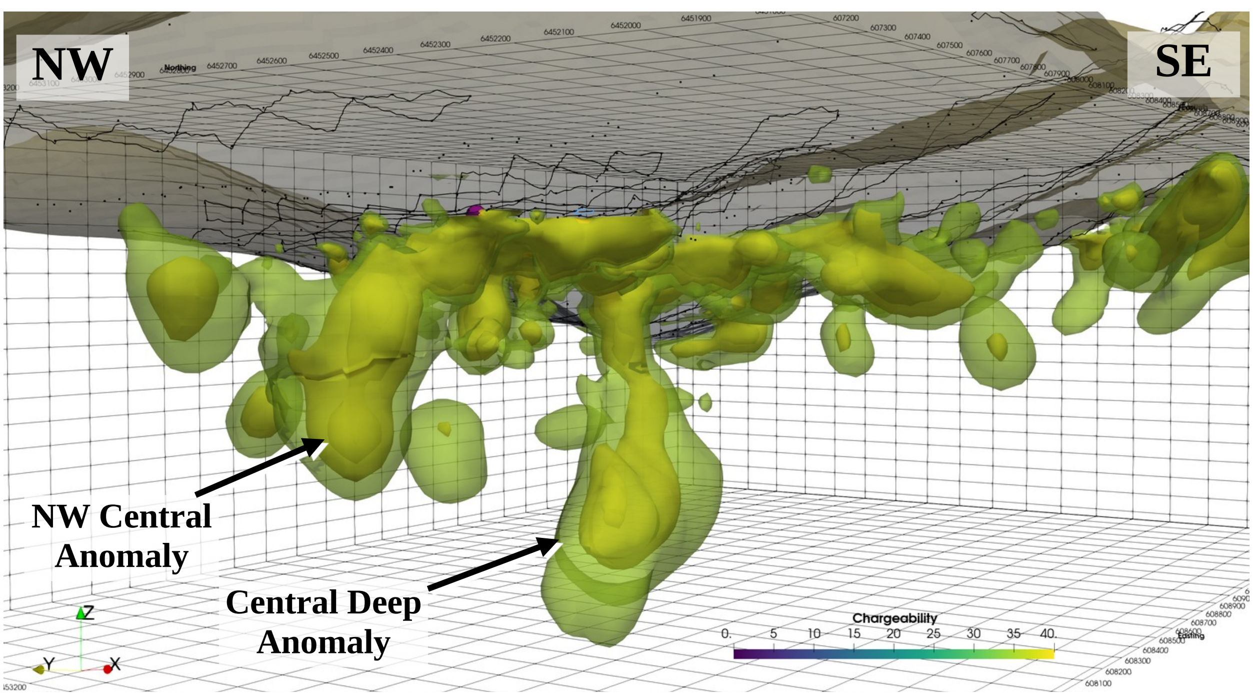

Figure 20: Central Deep Anomaly – 3D Chargeability iso-surfaces. Section view looking northeast.

3D Iso-surfaces @ 35, 40, 45, 50 ms

Figures 21 to 24 below show the spatial relationships between the chargeability and resistivity inversion models. The main correlations are:

- The deep chargeability anomaly is coincident with the south, deep low resistivity anomaly. The upper portions of the anomalies occur along the same dipping plane (steeply to the south) with the high chargeability located along the east edge of the low resistivity body. At depth, the high chargeability and low resistivity bodies are coincident.
- The high chargeability near-surface anomaly at the head of Halls Creek is observed to be bounded on the north and west sides by the near-surface high resistivity anomalies.
- The north deep low resistivity anomaly is not associated with a chargeability anomaly.
- The muscovite granodiorite has a low chargeability and medium to high resistivity response.

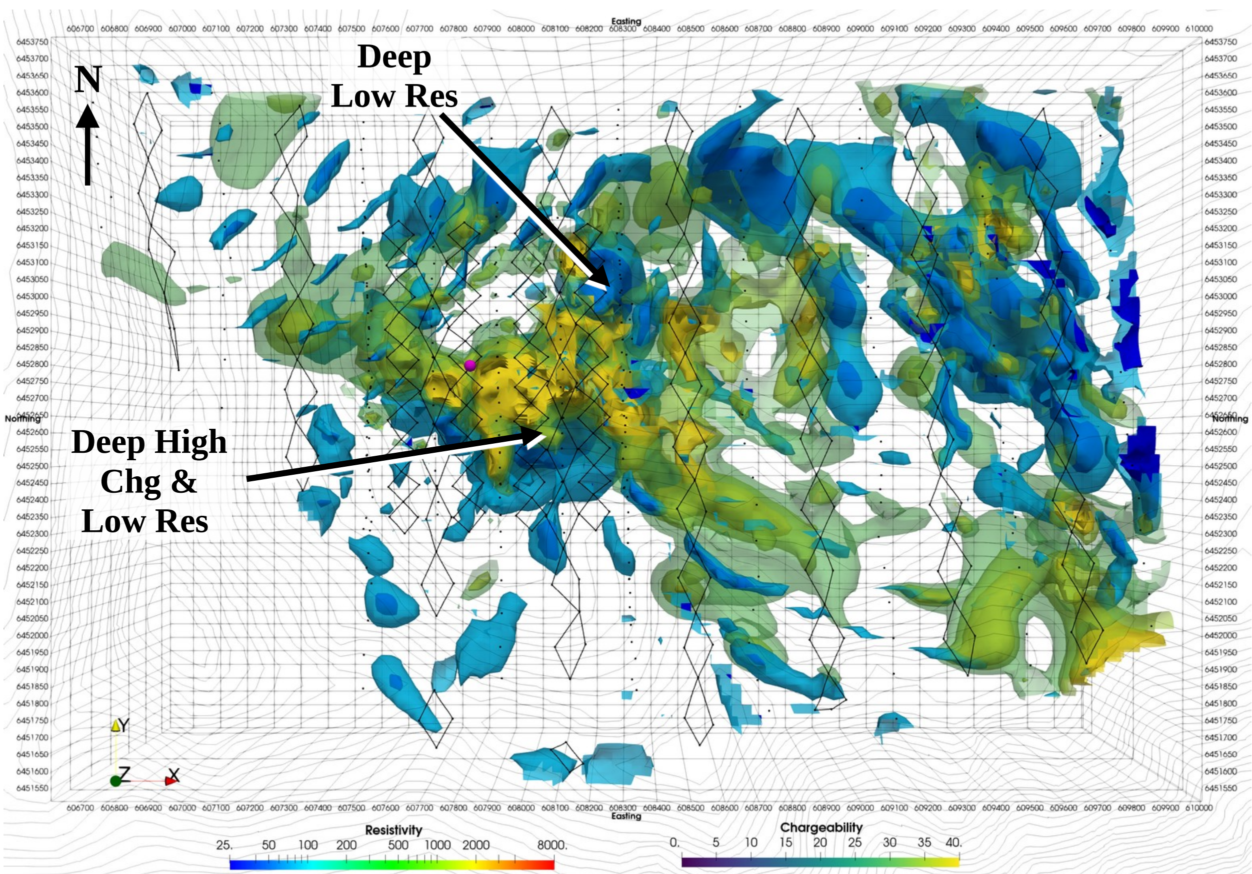

Figure 21: Combined 3D chargeability and resistivity inversion models (plan view). High Chg and Low Res.
3D Iso-surfaces: Chg = 30, 35, 40, 45, 50 ms / Res = 20, 60 ohm.m

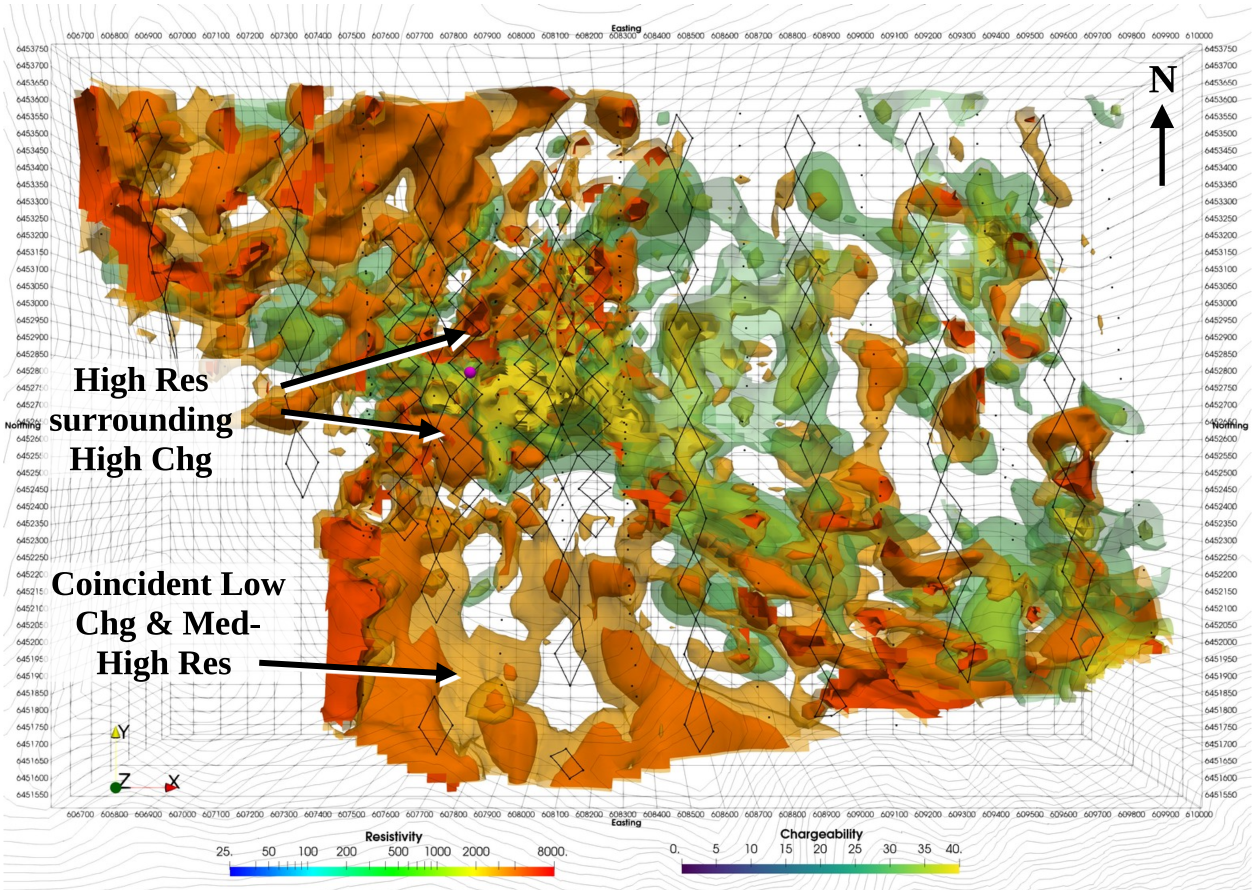

Figure 22: Combined 3D chargeability and resistivity inversion models (plan view). High Chg and High Res. 3D Iso-surfaces: Chg = 30, 35, 40, 45, 50 ms / Res = 3000, 5000 ohm.m

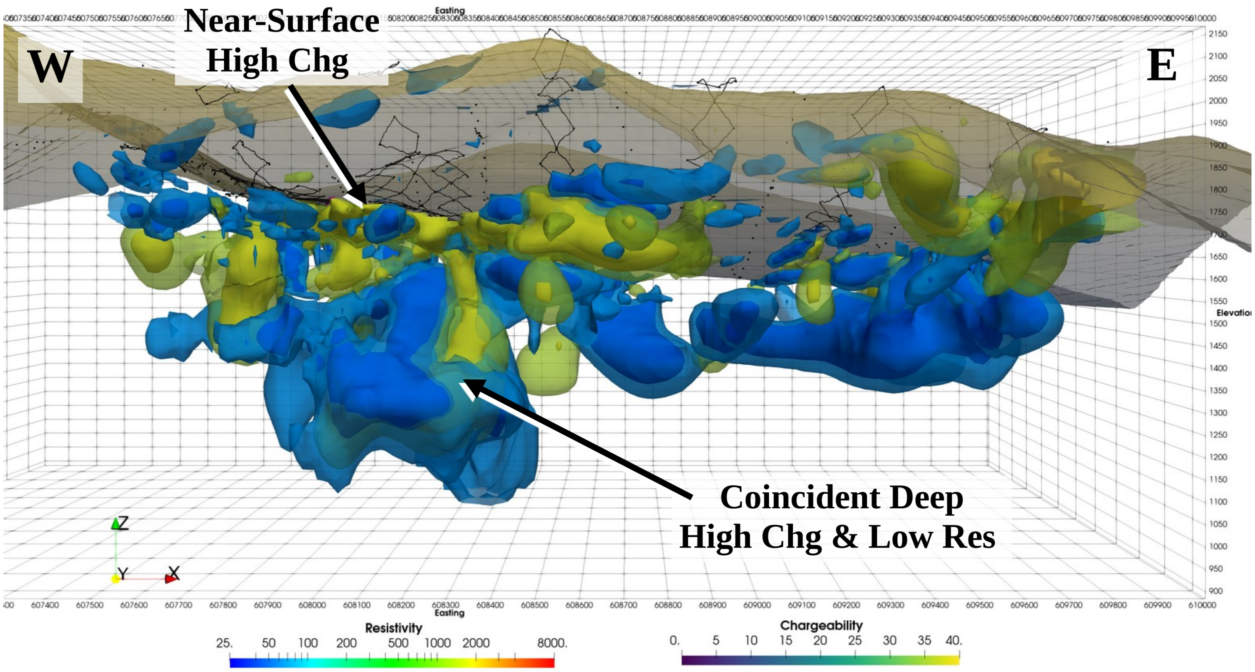

Figure 23: Combined 3D inversion models. Section view looking north. High Chg and Low Res.

3D Iso-surfaces: Chg = 35, 40, 45, 50 ms / Res = 20, 60 ohm.m

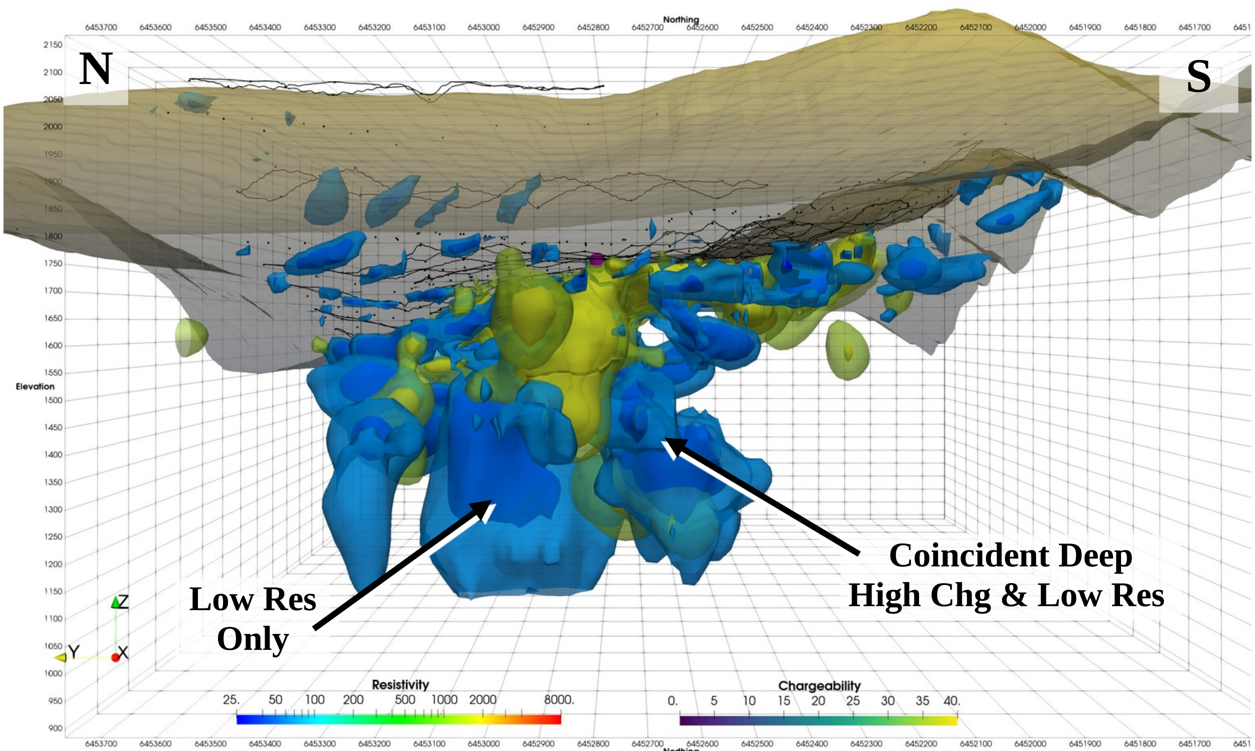

Figure 24: Combined 3D inversion models. Section view looking east. High Chg and Low Res.

3D Iso-surfaces: Chg = 35, 40, 45, 50 ms / Res = 20, 60 ohm.m

The interpreted structures from the resistivity and chargeability inversion models are shown together in Figure 25. Structures interpreted from the resistivity model are shown as black short dashed lines and from the chargeability model as green long dashed lines. Both models show many of the same structures, although the location of these features are a bit different.

- The prominent northwest-southeast oriented structure is present in both models. The structures are parallel to each other with an offset of approximately 125-150 m observed. The resistivity structures is located to the southwest of the chargeability structure.
- The primary northeast oriented structure is present in both models. The structures are sub-parallel to each other with an offset of approximately 180 m.
- The possible north-south cross-cutting structure is present in both models in approximately the same location.

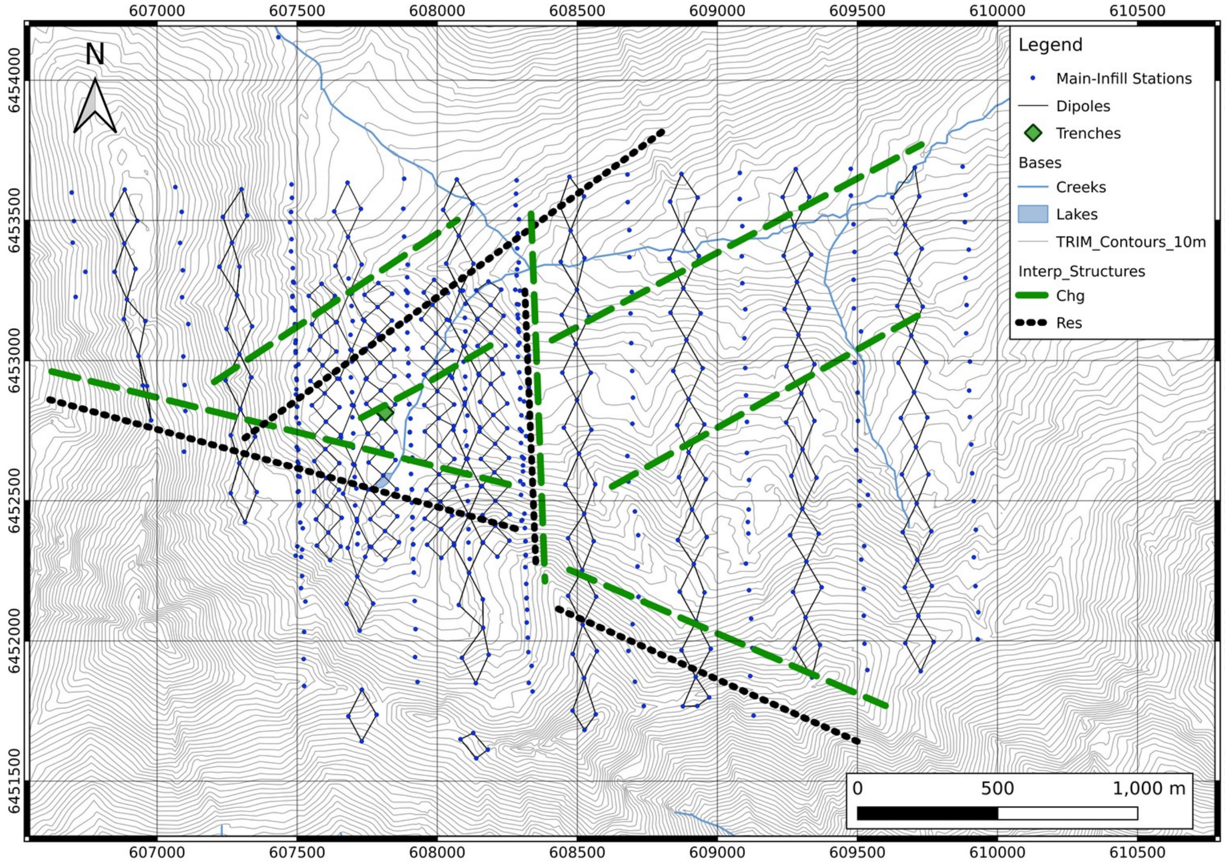

Figure 25: Interpreted Resistivity & Chargeability structures (Black = Res / Green = Chg)

Conclusions and Recommendations

The Volterra 3D resistivity and induced polarization data collected on the Frog property has identified multiple structures as well as significant near-surface and deep chargeability anomalies on the east side of Halls Creek in the same general region as the historical trenches.

The resistivity data has succeeded in mapping the geology relatively well with clear differences in amplitudes and “texture” observed between the different mapped units.

There are multiple structures present in the models. The most notable is a northwest-southeast oriented structure separating higher chargeability responses to the northeast from low chargeability to the southwest. The structure is observed in both the chargeability and resistivity models, although an offset between the models is present. There are also a number of northeast oriented structures, especially in the chargeability model. The primary northeast structure, located to the northwest of Halls Creek and adjacent to the main chargeability anomaly, may play a role in controlling the known mineralization.

The survey has identified a high amplitude near-surface chargeability anomaly located at the head of Halls Creek near the historical trenches. On the east side of the creek below the near-surface anomaly, there is a high amplitude chargeability anomaly coincident with a low resistivity anomaly. These coincident anomalies are steeply dipping towards the south. Both anomalies are open to depth, exceeding the depth of investigation of the survey. This deep anomaly is recommended as a priority target and may represent a continuation of mineralization.

It is recommended that this interpretation be reviewed by a geologist who is familiar with the structures and mineralization present on the project.

Appendix 1: Statement of Qualifications

I, Ross Polutnik, of the city of Burnaby, Province of British Columbia, hereby certify that:

1) I graduated from the University of Alberta with a B.Sc. Specialization in Geophysics degree in 2008.

2) I have practiced my profession continuously from that date.

3) I am a Professional Geoscientist registered (#45076) in good standing with the Association of Professional Engineers and Geoscientists of British Columbia

4) I have no interest in Bonanza Mining Corporation, nor do I expect to receive any.

Signed by:

Ross Polutnik, B.Sc. P.Geo
Geophysicist
S.J.V. Consultants Ltd.
EGBC Firm Permit to Practice #1002772

PROFESSIONAL
PROVINCE OF
R. A. POLUTNIK
45076
BRITISH COLUMBIA
GEOSCIENTIST

Dec 23, 2022

Appendix 2: References

Butler, S., 2021, Technical Report on the Frog Project for Bonanza Mining Corporation.

Chen, B., Polutnik, R., 2022, Logistics Report Prepared for Bonanza Mining Corporation, Volterra-3DIP on the Frog Property, Dease Lake, BC, SJ Geophysics Ltd.