# The textural and mineralogical mechanism for induced polarization (IP) effects in gold-bearing rocks from the Herbert-Brent gold showing, Yellowknife Greenstone Belt, Northwest Territories, Canada

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In June 2015, geological mapping discovered significant concentrations of gold now known as the Hebert-Brent (HB) showing, which is situated within an 11 m-wide highly sulphidized sericite-ankerite schist shear zone that is hosted in a 10–15 m-wide, quartz-feldspar porphyry. The HB gold showing is located within the Barney Deformation Corridor of the Yellowknife Greenstone Belt (YGB), Northwest Territories. Two 400 m long IP/resistivity survey lines, with 5/10 m electrode spacing using a multi-gradient array, were completed over TerraX Minerals Inc. As expected the sulphidized mineralization produced an electrical contrast with the surrounding host rocks. In addition, the survey exposed a previously undiscovered anomalous IP source. However, non-economic mineralization can produce an IP response at subsurface, which poses a problem when attempting to interpret newly discovered anomalous IP bodies. It is therefore essential to understand the textural and mineralogical mechanism that gives rise to IP anomalies to avoid non-economic targets. The purpose of this preliminary study is to characterize the mineralogy and texture of variably mineralized rock that is strongly anomalous in resistivity or chargeability.

Detailed textural examination using MicroXRF EDS mapping was performed on 8 variably mineralized samples taken from the HB gold showing. This has been done in order to determine the textural and mineralogical characteristics of anomalous IP zones that are associated with gold mineralization.

MicroXRF EDS mapping on the mineralized samples, has revealed the existence of electrically conductive mineral grains (pyrite, arsenopyrite) in concentrations of (10–15%). The interconnection of sulphide mineralization is good however, segments of interconnected sulphide mineralization is disconnected. No significant non-sulphide IP source has been identified. Continued work will involve examining the dependence of IP effects on sulphide type, concentration, texture, grain shape, and grain size.

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