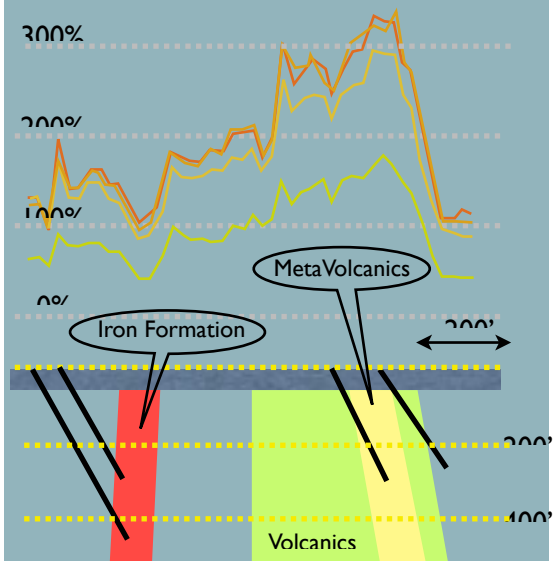
Lamontagne Geophysics

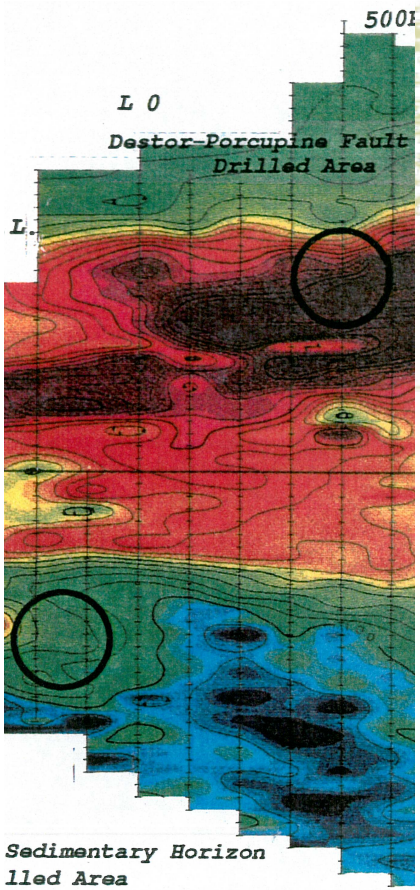
DETECTING ALTERATION USING

Inductive Source Resistivity

WINDJAMMER

The Windjammer case history illustrates the how ISR can be used to map altered volcanics in profile mode. The Windjammer property is a gold prospect is located near Matheson, Ontario on the Porcupine-Destor fault system. The property is underlain by volcanic, meta volcanics and iron formation. ISR successfully mapped the iron formation (as a low) and the altered volcanics (as a high). The late time channels (red) correlate well with the drilled geology.

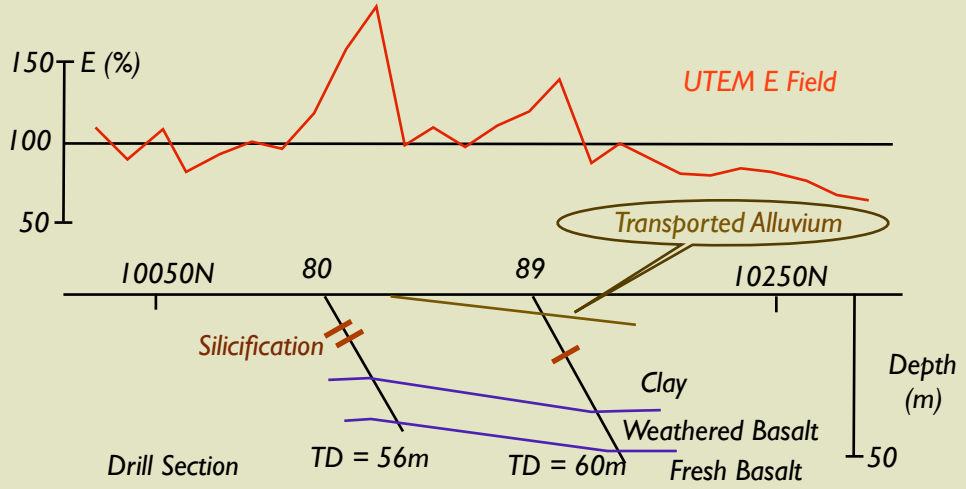




Above: Contoured late-time ISR data from Windjammer. The red areas (resistive) map the alteration associated with the Porcupine-Destor. (Courtesy Noranda)

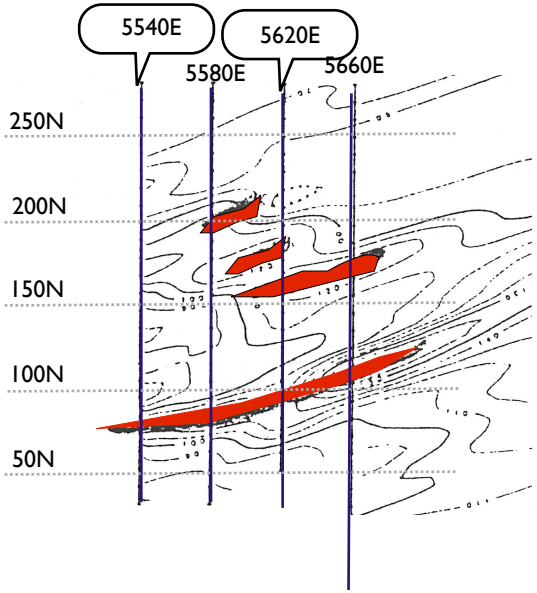
MOUNT AUBREY

The Mount Aubrey case history illustrates how ISR can be used in epithermal gold exploration. Drilling at Mount Aubrey located a number of zones of silicification as indicated in the diagram below. ISR profile data correlate well with silicification noted in the well logs.



Right:

Contoured ISR data (black) from Mt. Aubrey have been over lain on silicified zones (red) interpreted from drilling. The correlation of the the resistivity highs with the known silicification is excellent. Electric field measurements from an inductive source are a viable alternative to conventional resistivity / IP surveys for gold and other exploration targets.



LAMONTAGNE GEOPHYSICS LTD
20 Binnington Court, Kingston, Ontario, Canada K7M 8S3
_Tel: 613-531-9950 _Fax: 613-531-8987 www.lamontagnegeophysics.com/

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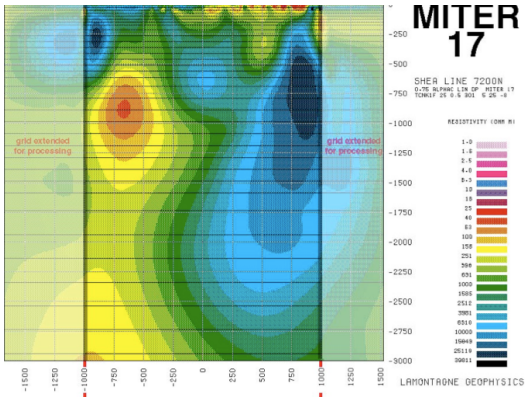
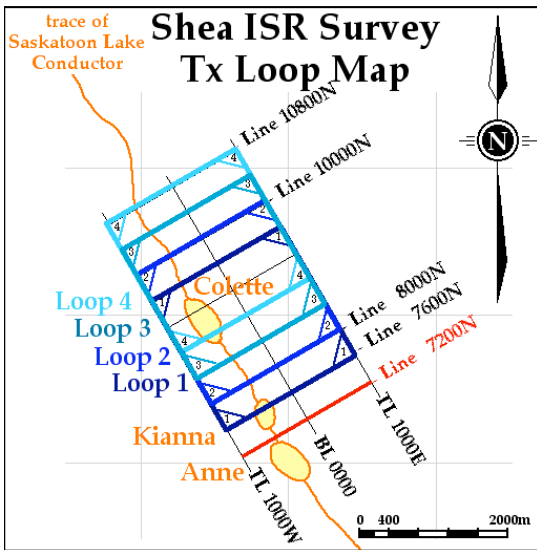
New Developments in ISR

RESISTIVITY IMAGING AT SHEA CREEK

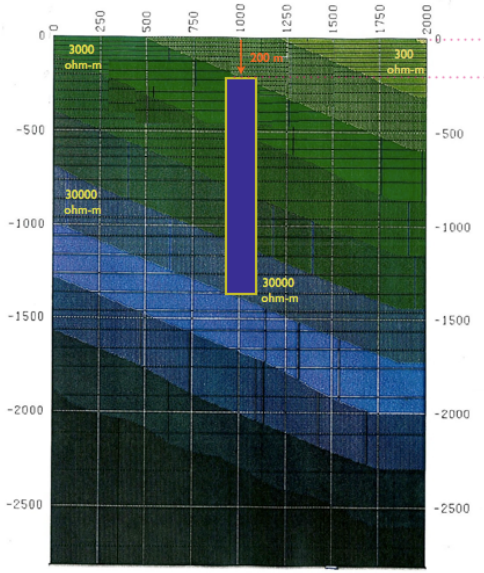
A recent ISR survey at Shea Creek, Saskatchewan used a 4-loop ISR survey to acquire data over 2 km of survey line. The field survey was completed in under 3 days, and yielded data with penetration depths to approximately 4000 meters. The survey data were processed into the image (right) which shows a number of features in the Athabasca sandstone, which is approximately 700 meters deep in the survey area. A number of inferred alteration zones in the sandstone were mapped, with the one located at 500W at 400 m depth confirmed by resistivity and porosity logs.

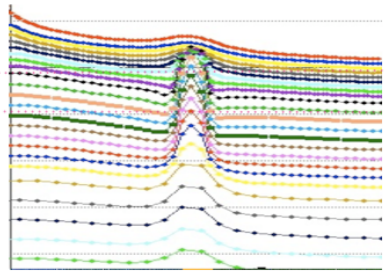




A plan map illustrating the layout of the loops used in the ISR survey and the mineralization along the Saskatoon Lake conductor is shown to the left. The survey line crosses between the Kianna and Anne mineralized zones. The conductor appears in the section as a conductivity high below the unconformity, and is located below the alteration detected in the drillhole at 500 W. The large contact feature detected in the basement may due to a resistive feature in the basement that extends under the east of the area.

MODELLING

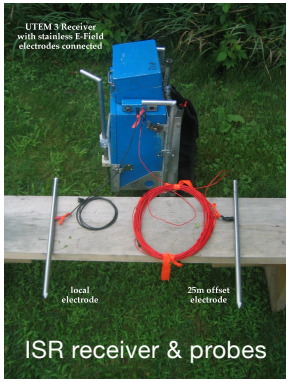




The horizontal electric field (above) increases when it encounters a vertical resistive feature such as that shown left. This results in an electric field high on the surface of the earth (top profile, red) and explains the ISR highs seen over the altered volcanics at Windjammer and over silicification at Mt. Aubrey

ADVANTAGES OF ISR

- Fast and cost effective
- Deep penetrating
- Good lateral resolution
- No ground contact problems
- Complete primary field coverage



ISR receiver & probes

APPLICATIONS

ISR has been shown to be sensitive to conductive and resistive alteration and so can be applied to exploration over mineral, geothermal or petroleum prospects where alteration is associated with emplacement processes. Mineralized targets include epigenetic and Carlin type gold deposits, porphyries, roll front and Athabasca uranium, and VMS. Because ISR is sensitive to vertical resistivity contracts, it has application to detecting dipping chromite, scheelite and silica

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