

### ANNULAR STRUCTURE OF LAHJEYRA (REE, Nb, Fe, Mo, Au, V) (Southern Provinces, Morocco)

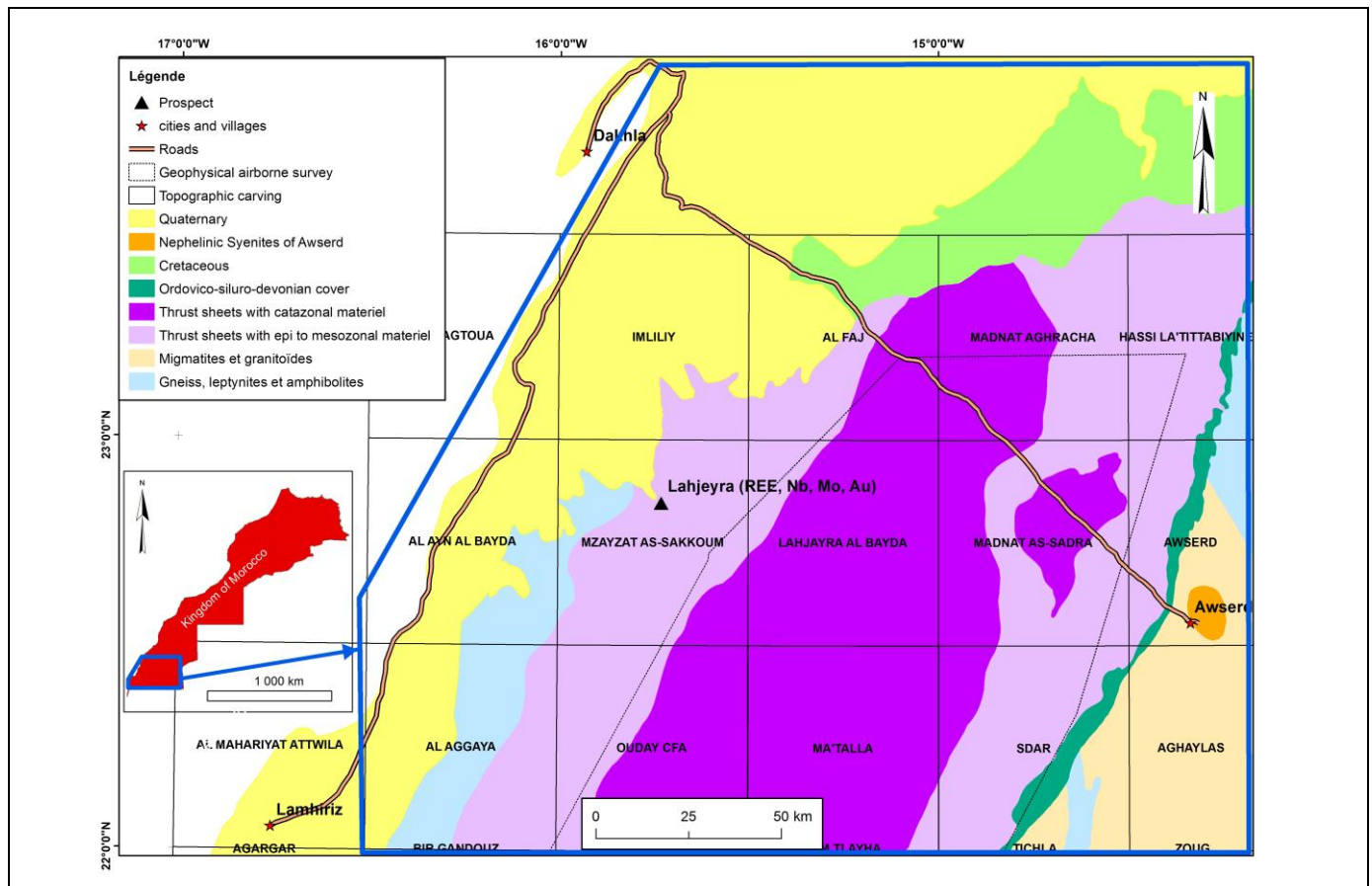
February 2016

#### KEY POINTS

- Volcanic structure of breccia silica and iron oxides;
- Annular structure linked with magnetic and radiometric anomaly;
- High grade of REE, Niobium and Iron with indicial grades of Mo, Au and V;
- Plurikilometric extent;
- Proximity to the circular structure of Twihinata and Lamlaga.

#### LOCATION AND INFRASTRUCTURE

The prospect of Lahjeyra is located 200 km south of the city of Dakhla, including 130 km of roads and 70 km of carriageable track, in the 1/100 000 topographic sheet of Mzayzat As-Sakkoum.



Location of Lahjeyra structure in general geological setting

## REGIONAL GEOLOGY

The Proterozoic formations of the sector are represented by two distinctive blocks:

- An oriental Archean block stable and autochthonous being part of the West-African shield
- A western allochthone block, constituted by thrust sheets formed during the Hercynian orogeny; the age of the formations of this block stretched out NNE-SSW is from Palaeozoic to Archean.

## LOCAL GEOLOGY

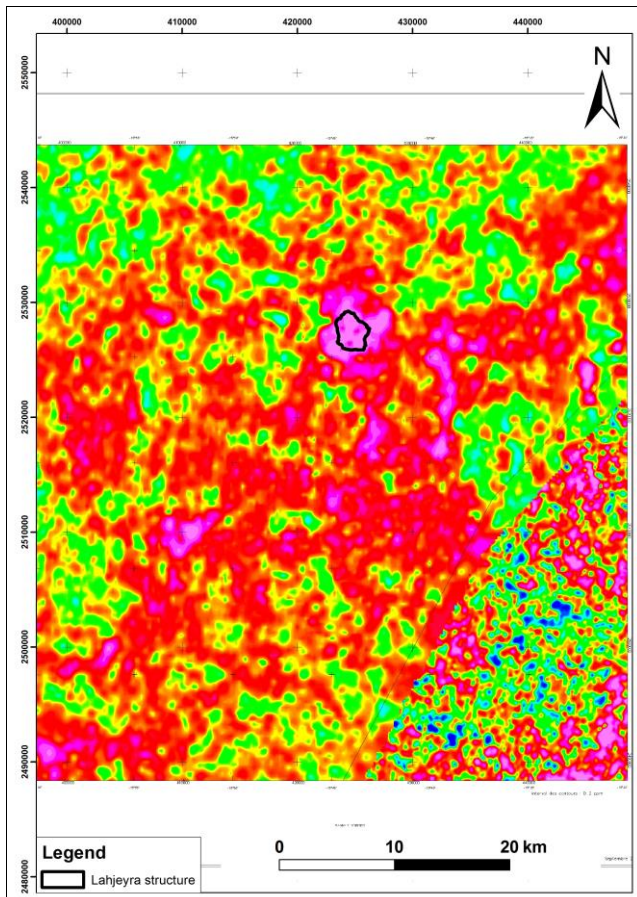
Lahjeyra is located 80 km north of the structure Twihinate. The geological survey shows a large annular structure of at least 4 km long and 2.5 km wide through Proterozoic gneiss. This volcanic structure includes a main mass (composed of breccia silica and iron oxide) and a peripheral ring (composed of iron oxide and quartz) that surrounds it. These two parts are separated in places, by a large intermediate depression filled with recent formations.

The mineralization in Rare earths elements and Niobium has been found either in iron oxide and breccia silica.

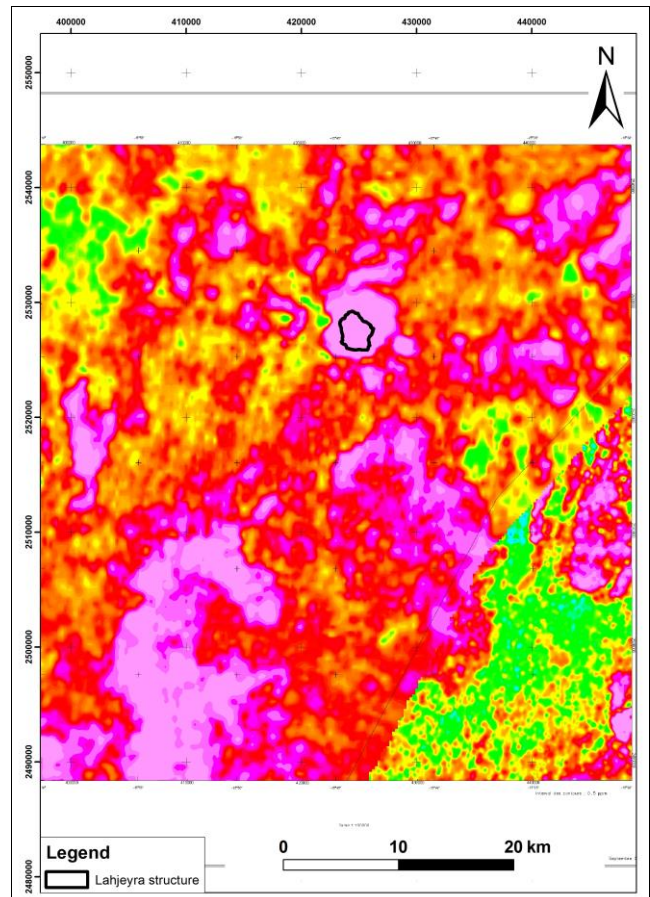
## EXPLORATION WORK AND RESULTS

The magnetic and radiometric data of Mzaysat As-Sakkoum were obtained by the interpretation of the aero magnetic and spectrometric survey done by Sander Geophysics on the southern part of Morocco. Several anomalies were individualized and have undergone geological check which led to the discovery of Lahjeyra structure.

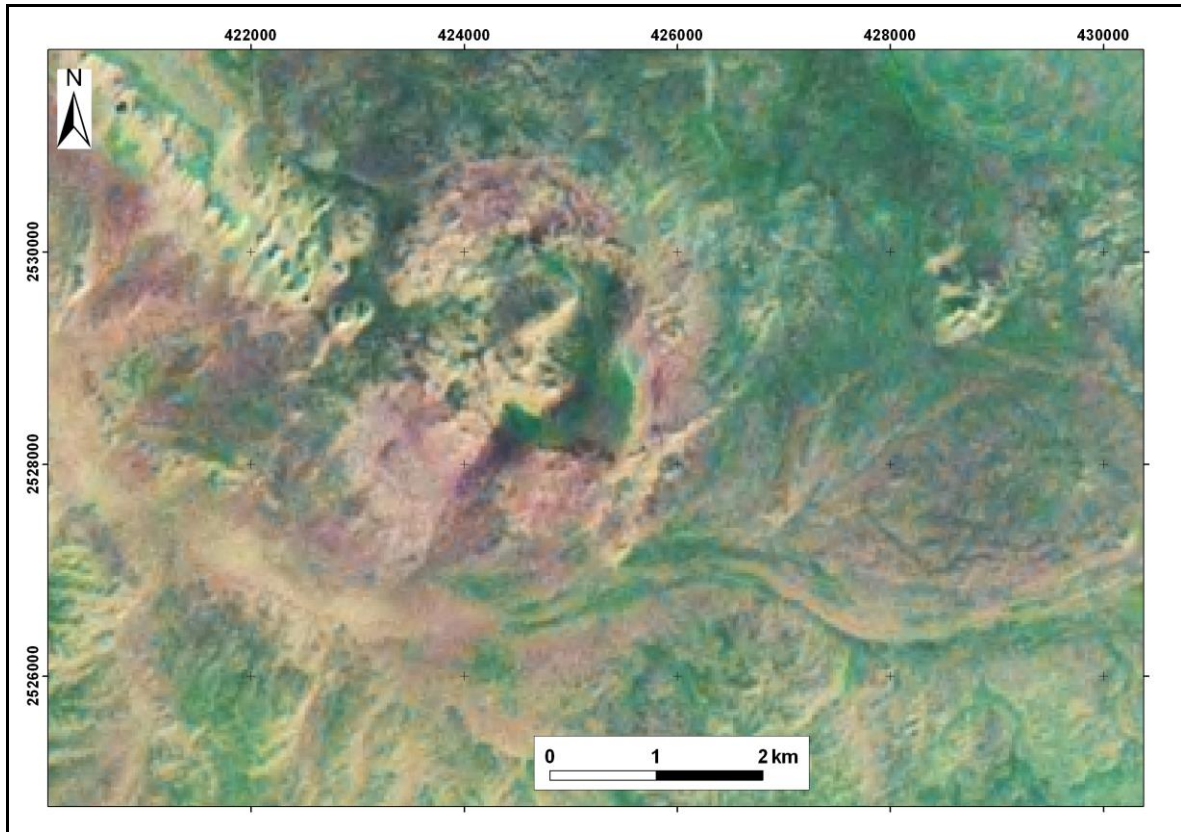
Lahjeyra circular structure is clearly visible on the Landsat image and is marked by the superposition of three geophysical anomalies (uranium, thorium and magnetic).



**Survey uranium anomaly**



**Survey thorium anomaly**



**Lahjeira structure in Landsat image**

The geological survey (mapping to 1/5000 of an area of 8 km<sup>2</sup>) shows that the magmatic complex is mainly composed of varied breccia silica outcropping in the central part and iron oxides surrounding depression.

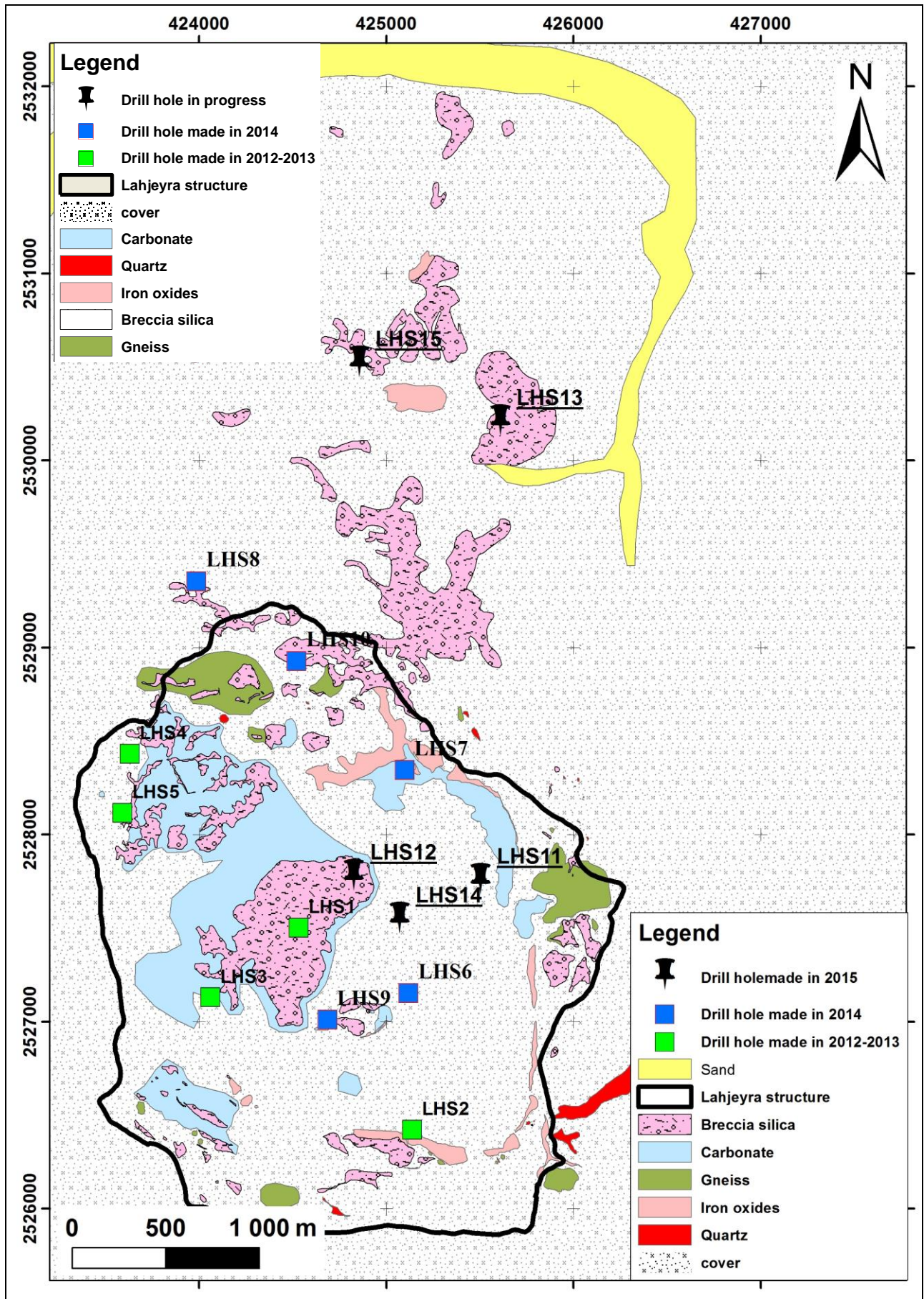
Several ferruginous and breccia quartz vein are identified, they primarily affect the gneissic basement hidden by recent cover (sand, soil and reg) which is extended to the periphery of the structure.

Siliceous outcrops are largely represented by varied Iron silica vacuolar and brecciaed.

The quartz veins are generally located at the periphery of the structure, they have a variable direction (subparallel to the peripheral ring), metric dimension and thickness that can reach 2-6 m. Quartz is often white slightly ferruginous.

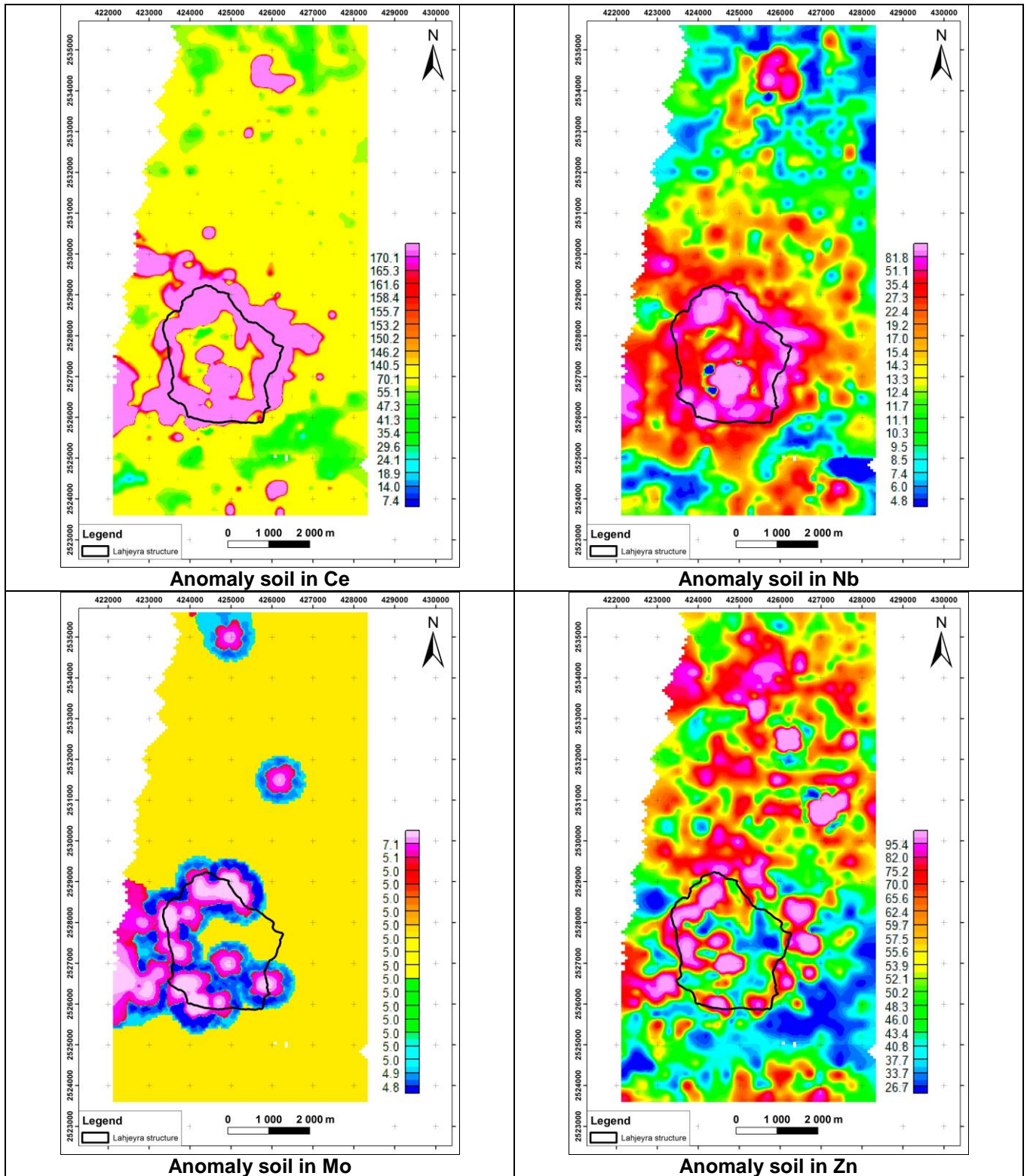
Carbonates occupy the depression where they are represented by limestone.

The results of chemical analyzes ponctually reach 3.52% Ce, 2.10% La, 0.63% Nb, 137 ppm Ta and 936 ppm U.

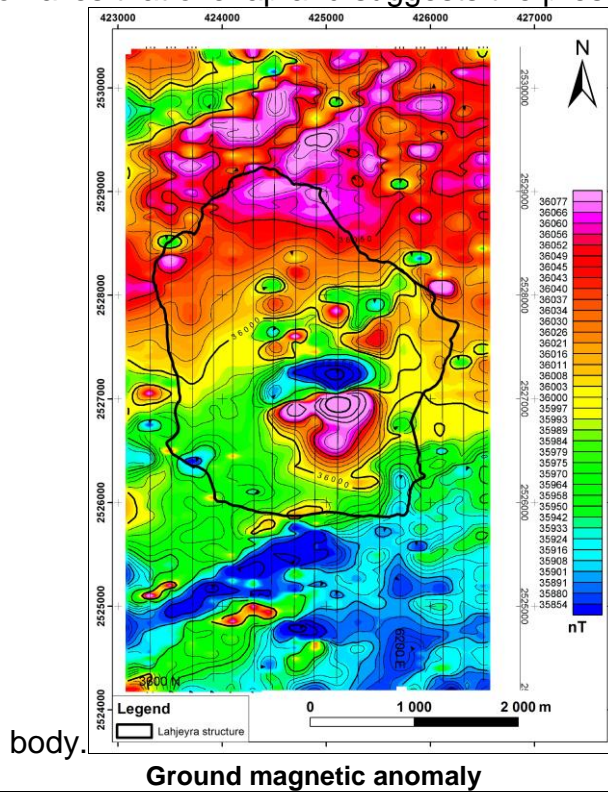


Geological Survey 1/5000 with the drill holes

A survey of soil geochemistry was conducted over an area of about 60 km<sup>2</sup> using a square grid of 250 m and on east-west direction. 920 soil samples were collected. The analysis results show anomaly in Ce, Nb, Mo and Zn, which coincide with the structure of Lahjeyra and its immediate surroundings.



A ground geophysical survey in magnetometry and gravimetry is done, it shows two magnetic and gravity anomalies that overlap and suggests the presence of a dense magnetic



A first drill holes survey with five holes totaling 814.2 m is performed on the structure. All holes intersect the structures sought and the samples are analyzed. Preliminary results show REE contents generally in the order of 0.3%, with some levels of about 1 and 2% REE. There are also high levels of Thorium between 300 and 2000 ppm.

A second drill holes survey was completed in 2014 totaling 946.80 m. The survey results show grades in REE between 0.2 and 0.9% and Th contents average 489 ppm. A third drilling campaign totaling 1031 was completed. Polls have crossed the desired structures. Radiometry measurements show a radioactivity ranging from 400 to over 1,000 c/s which confirms that they are mineralized. The carrots are being sampled and analyzed.

## PERSPECTIVES

Prospects and potential of the sector are large with:

- The dimensions of the structure;
- The extension of the prospect Lahjeyra under the intermediate depression;
- The existence of other geophysical and geochemical anomalies in the immediate vicinity of the annular structure Lahjeyra.
- The presence of gold mineralization and molybdenum on the peripheral ring.

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