

# KINGDOM OF MOROCCO



المكتب الوطني للهيدروكاربورات و المعادن  
OFFICE NATIONAL DES HYDROCARBURES ET DES MINES

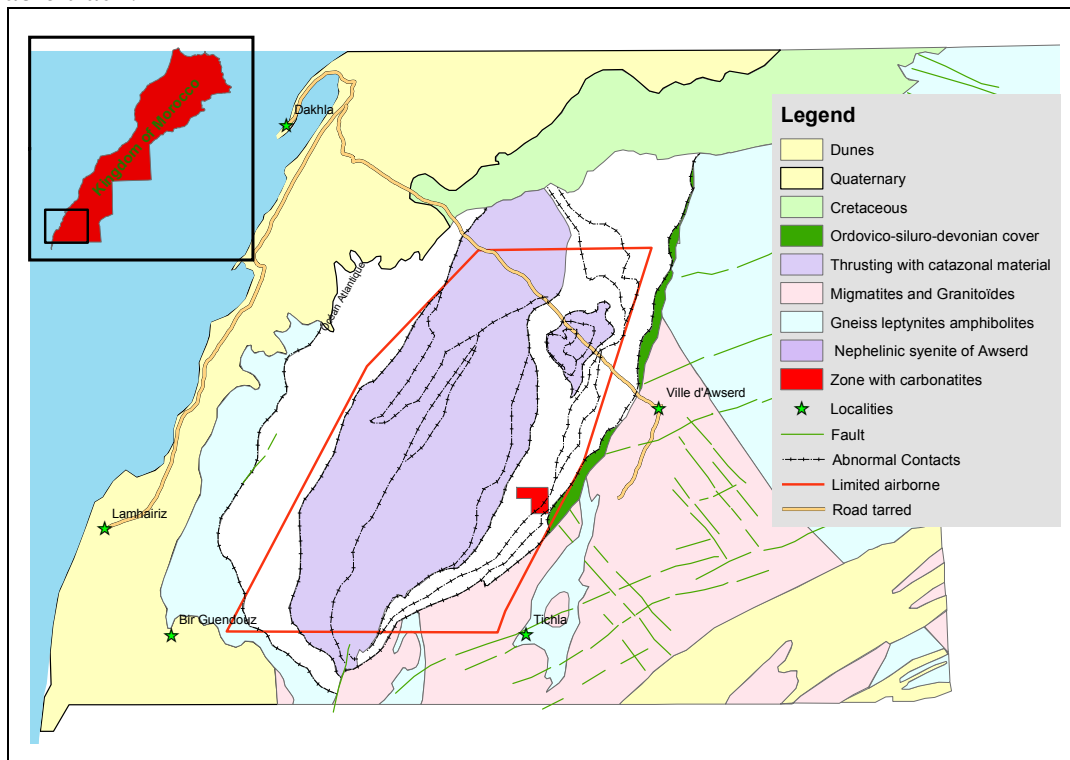
## GLIBAT LAFHOUDA CARBONATITES (South Provinces, Morocco)

### KEY POINTS

- Iron oxides associated with dolomitic carbonatites,
- Circular structures of iron oxides superimposed on an airborne magnetic and radiometric (Uranium) anomaly,
- High grade of Niobium, Tantalum, Uranium and light rare earth elements (LREE)
- Kilometric extension of the district with bodies of hectometric or even kilometric dimension mineralized in Nb, Ta, U and the light rare earth elements,
- Objective susceptible to be a world class deposit for the Niobium, the Tantalum, the light rare earth elements and iron.

### LOCATION AND INFRASTRUCTURE

The Glibat Lafhouda prospect is located to the South west of Awserd; it is accessible from this city either directly by 70 km of carriageable track; either by 50 km of asphalt road and 30 km of carriageable track.



Extracted from the geological map of Morocco 1/1 000 000 showing the location and the general geological setting of Glibat Lafhouda

## REGIONAL GEOLOGY

The Proterozoic formations of ONHYM mining exploration area are represented by two distinctive blocks:

1. An oriental archean block stable and autochthonous being part of the West-African shield
2. 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 gradual between the Paleozoic and the Archean.

## EXPLORATION WORKS AND RESULTS

Regional airborne geophysical survey had been achieved by ONHYM in 2002 on an area of 20852 km<sup>2</sup> in the Mauritanides zone in the southern part of Morocco. The geological check of radiométrique and aéromagnétique anomalous led to the discovery of Glibat Lafhouda carbonatite in 2006.

This massif of carbonatites is hosted in the proterozoique gneiss, the landsat image show the clean contrast between the dolomites and the gneiss that are also crossed by basic dykes oriented NE/SW. Within the carbonatite we have iron oxide breccias.

This carbonatite is underlined by a large radiométrique anomalous superimposed on an aéromagnétique anomalous.

The surface sampling of iron oxide structure returned 0, 37% Nb<sub>2</sub>O<sub>5</sub>, 217 ppm Ta<sub>2</sub>O<sub>5</sub> and 315 ppm U<sub>3</sub>O<sub>8</sub>.

Following these encouraging results, the ONHYM conducted during the 2007 and 2008 an exploration program which consists of:

"A geological survey on a 1/2000 scale covering an area of 5 km<sup>2</sup> with withdrawals and analyses of about 850 samples

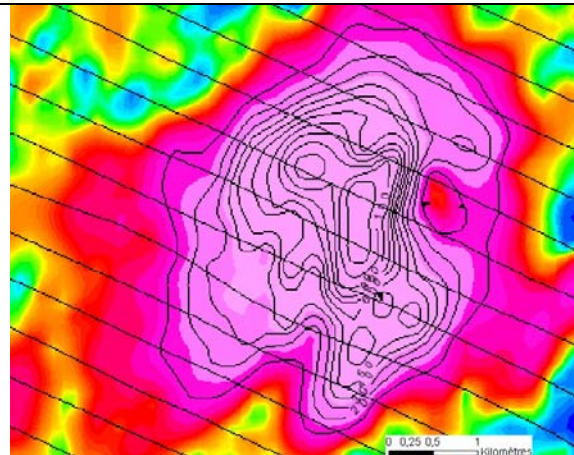
"A topographic survey covering a surface of 4 km<sup>2</sup>

"A geophysical survey (gravimetric and magnetometer) on a surface of about 10 km<sup>2</sup>

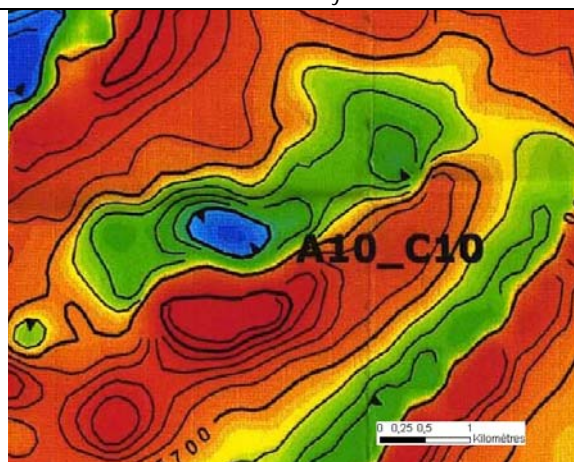
"14 bore holes of 1880 of which 840 m has been achieved during 2007 and 1042 during 2008.



Landsat Image showing the carbonatites of Glibat Lafhouda



Uranium radiometric anomaly of Glibat Lafhouda

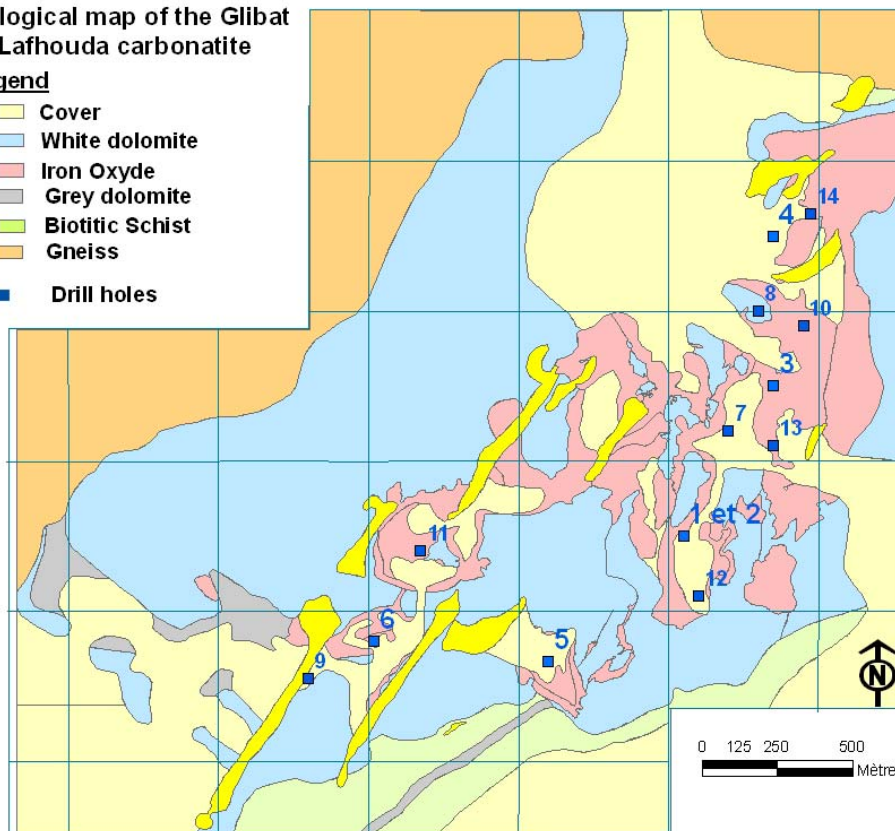


Airborne magnetic anomaly of Glibat Lafhouda

**Geological map of the Glibat Lafhouda carbonatite**

**Légend**

- Cover
- White dolomite
- Iron Oxyde
- Grey dolomite
- Biotitic Schist
- Gneiss
- Drill holes



**WORK RESULTS**

The 7 first drill holes had returned encouraging results as shown in the following table. The analyse of the rest of drill holes are not achieved yet. The grades have been calculated for the oxides of iron from samples taken systematically every 1m. The carbonatites are also mineralized (0,1% Nb2O5 on average).

Bore hole	Apparent thickness (m)	Nb <sub>2</sub> O <sub>5</sub> (%)	Ta <sub>2</sub> O <sub>5</sub> (ppm)	U <sub>3</sub> O <sub>8</sub> (ppm)	ΣREE (%)
GLS-1	56,00	0,45	141	360	0,25
GLS-2	39,60	0,52	175	427	0,26
GLS-3	43,60	0,18	219	387	0,18
GLS-4	50,40	0,14	115	436	0,48
GLS-5	32 ,60	0,48	146	312	0,19
GLS-6	71,40	0,27	119	427	0,2
GLS-7	29,00	0,79	846	1261	0.47



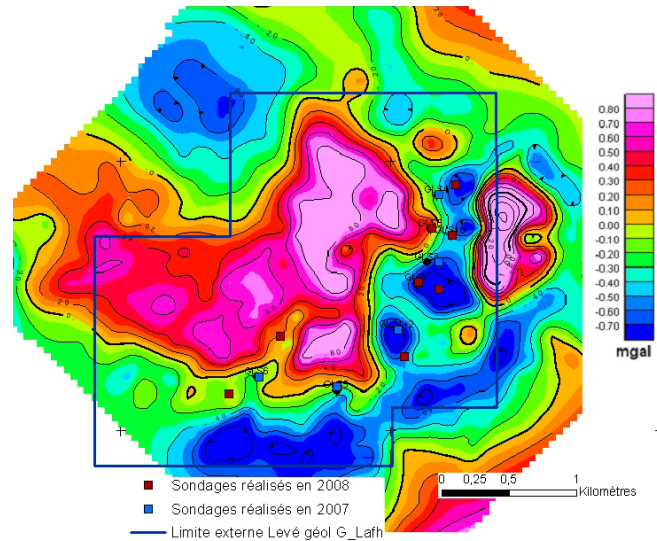
EW View from south of Glibat Lafhouda showing iron oxide



The gravimetric survey conducted in Glibat Lafhouda carbonatite enable us to distinguish two zones :

- ▶ A red zone which is formed by carbonatite and it is characterised by positive Bouguer anomalies
- ▶ A blue zone where Bouguer anomalies are negatives and which is formed by iron oxides.

We think that the zone of negatives anomalies are the feeder zone of iron oxides



## PERSPECTIVES

A synthesis of data will be achieved after the receipt of all drill holes results, and an estimation of the ore reserves will be done, it will give us an idea about the importance of this prospect.

A regional study shows the existence of other outcrops of carbonatite as Glibat El Fernan located at some 5 km on the north and Glibat drag located at some 12 km on the north west), where surface sampling returned encouraging grade in Niobium, tantalum and uranium.

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