

## HASSIANE ED-DIAB (W-CU-AU) (ORIENTAL REGION, MOROCCO)

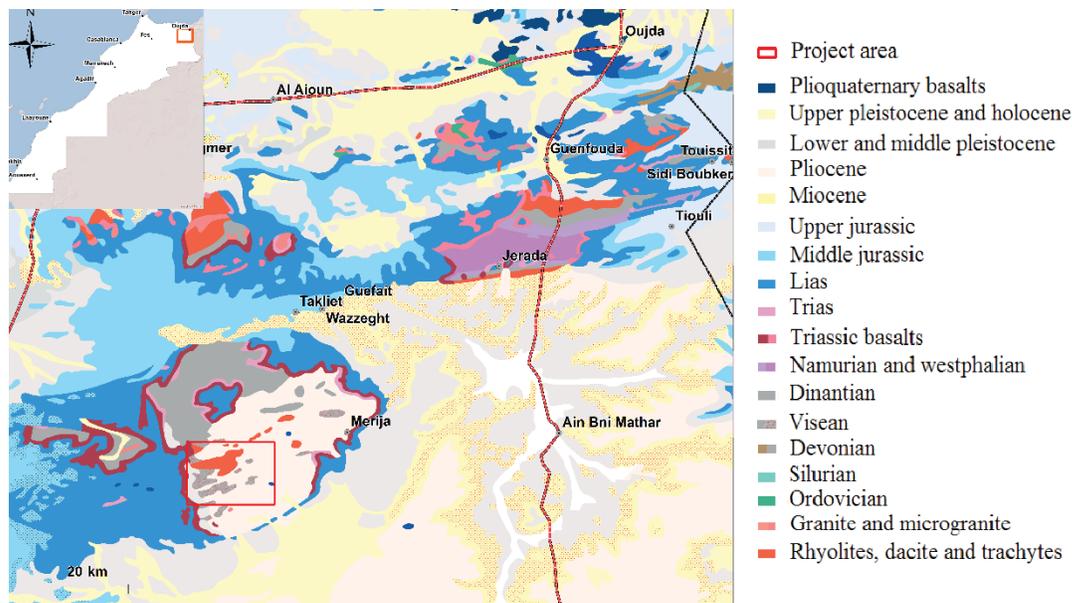
### Overview :

The mineralization of Hassiane Diab is associated with a buried granite, which appears on the surface by a contact metamorphism and granitic apophysis. An old exploitation in the 50's produced about 20 000 t of W ore. The mineralization appears as wolframite in quartz veins field spreading over an area of 2 km<sup>2</sup>. Resources are estimated to 341 640 t at 0.3% WO<sub>3</sub>. The area is characterized by its proximity to the road network linking Ain Beni Mathar and Taourirt and an easy access to rail and electrical networks.

Target name	Hassiane Ed-Diab
Type of mineralization	Veins
Licence coverage	3 research permits (covering 48 Km <sup>2</sup> )
Available data	Geological data/ Rock samples/ Geophysical data
Grades	0.3% WO <sub>3</sub> , 0,1 to 2 g/t Au
Dimensions	Vein field surface : 2km <sup>2</sup> / Thickness : 1 to 1.5 m/ Length : 10 to 700 m
Resources / Reserves	Probable reserves : 341 640 t @0.3%WO <sub>3</sub>
Infrastructures	Road and high way, Rail network, Electrical network.

### Geological settings and location:

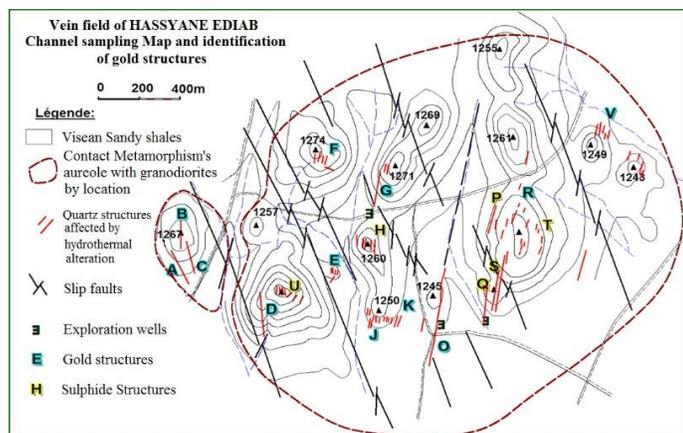
Hassiane Ed Diab sector is located 80 km SE of Taourirt. It contains a number of tungsten's deposits and occurrences. The most important is the old wolfram mine of Hassian ed Diab. Three research permits cover the sector. The intensive erosion that affected the Jurassic carbonate formations of "Hauts Plateaux" shows an upper Visean age inlier, locally affected by contact metamorphism. Magmatic rocks in the area are varied and contain the granitic apophysis of Swiwin, the rhyodacites and biotite granodiorites and dykes of microdiorites. The presence of granitic apophysis and contact metamorphism suggest the presence of buried granite which is also individualized by the greisenised apex of Ras Mohamed and Ras Zaër units and the large gravity anomaly CAG (1963). Structurally, the basement of Hassiane Diab is crossed by a shear corridor N110 ° -120 ° responsible of the implementation of tungsten mineralized quartz veins.



Location and geology of Hassiane Ed-Diab Area

## Mineralization :

Hassiane Ed-Diab mineralization appears as a quartz and chalcedony vein field, with Wolfram and oxides, hosted in the Viséan shales. This vein field dominated by wolframite, occupies an area of approximately 2 km<sup>2</sup> and outcrops about two kilometers southwest of the Hassiane Diab shaft. A hundred vertical veins could be enumerated, with variable trends between NS and NW-SE. their thicknesses vary between a few centimeters to 2 meters, while their lateral extensions are limited and vary from a few tens of meters to 700 meters. Seventeen W, Cu and Au mineralized structures confined in a shear corridor were identified.



Hassiane Ed-Diab vein field

## Achieved Works and results :

Tungsten mineralizations in the area have been identified since the early 30's. Between 1947 and 1952, ONHYM undertook a number of mining works. The short exploitation period ended in 1954. About 20 000 t of W ore were extracted.

For economic reasons, the recovery of the works was performed by ONHYM, since 1977, and it demonstrated the rooting of W-Cu mineralization, in 1980, and subsequently proposed a research work program (geology, geochemistry, geophysics, trenching and drillings) whose implementation was made from 1982 to 1990. This work coupled with geophysical, geological, geochemical and sampling of the previous mining works allowed the estimation of probable reserves to 341 640 t at 0.3 % WO<sub>3</sub>. Two generations of quartz seems to be present; the first with wolfram followed by a second with sulphide. Known mineral paragenesis generally consists of muscovite, tourmaline, quartz, wolframite, scheelite, arsenopyrite, pyrite, bornite, chalcocite, covellite, chalcopyrite and hematite. The mineralization appears to be affected by late-magmatic, pneumatolytic (traces of B, Sn, F) and hydrothermal processes causing the mineralization zonation. Wolframite, the most important mineral, appears as spots or crystal aggregates in the quartz veins and sometimes in centimetric veins in the quartz gangue or in the fault plane along the wall.

The average grade is 0.3% WO<sub>3</sub> for a thickness of 1 to 1.5 m. Moreover, the presence of gold was reported in 1985 on the surface (up to 1.4 g / t Au over one meter thickness) and in the depth (up to 8 g / t Au over 20 cm at 240 m depth). Surface resampling by ONHYM in 2002 on the vein field of Hassiane Diab highlighted gold in 9 structures with grades varying from 0.13 to 2 g / t Au, with thicknesses ranging between 0.4 to 1 m and seems to be associated with pyrite and arsenopyrite. This can therefore give an additional interest to the potential of this sector.

## Outlook :

All three-exploration licenses covering Hassiane Diab deposit and a part of the Paleozoic inlier are interesting targets. The size of the vein field, studies (geology, geochemistry, geophysics) and metal opportunities in the region deserve further exploration. Indeed, several targets are to be defined, and the following additional work need to be executed to enhance the current project : **(i)** Certification of W resources, and recognition of other structures that have not yet being studied; **(ii)** Geophysical surveying and interpretation of recent airborne geophysics data **(iii)** The previous geochemical data interpretation provided the probable existence of hidden skarn deposits. This can open up opportunities for significant W, Cu and Au concentrations; **(iv)** In addition to tungsten, the sector is favorable for gold research due to the presence of interesting occurrences within the tungsten structures.

*For more information, please contact Ms.*

*Amina BENKHADRA*

*General manager*

*5, Avenue Moulay Hassan- BP 99 - Rabat,*

*Maroc Tél : + 212 5 37 23 98 98*

*Fax : + 212 5 37 70 94 11*

*E-mail : [benkhadra@onhym.com](mailto:benkhadra@onhym.com)*

*Web site : [www.onhym.com](http://www.onhym.com)*