

Table I-3-1 Main ore deposits and gossans around the area

Ore deposits or gossans	Summary
Kettara	- 1956: Cuprous pyrite 1956-1965: Survey for phosphates 1964-1981: Produced 8Mt ore including 5.3Mt of Pyrrhotite 1982: Closed.
Draa Sfar	1953: Gossan exploited 1962: magnetic survey and drilled (12holes). Cuprous pyrite discovered. Operated at present.
Hajar	Discovered in the 1984 by BRPM. Mining commenced during 1992. 3,000t/d, averaging 10.5% zinc, 3% lead, 0.3% copper and 60g/t silver in 2001.
Frizem	1984: Magnetic survey
Khwadra	2000: Drilling survey.

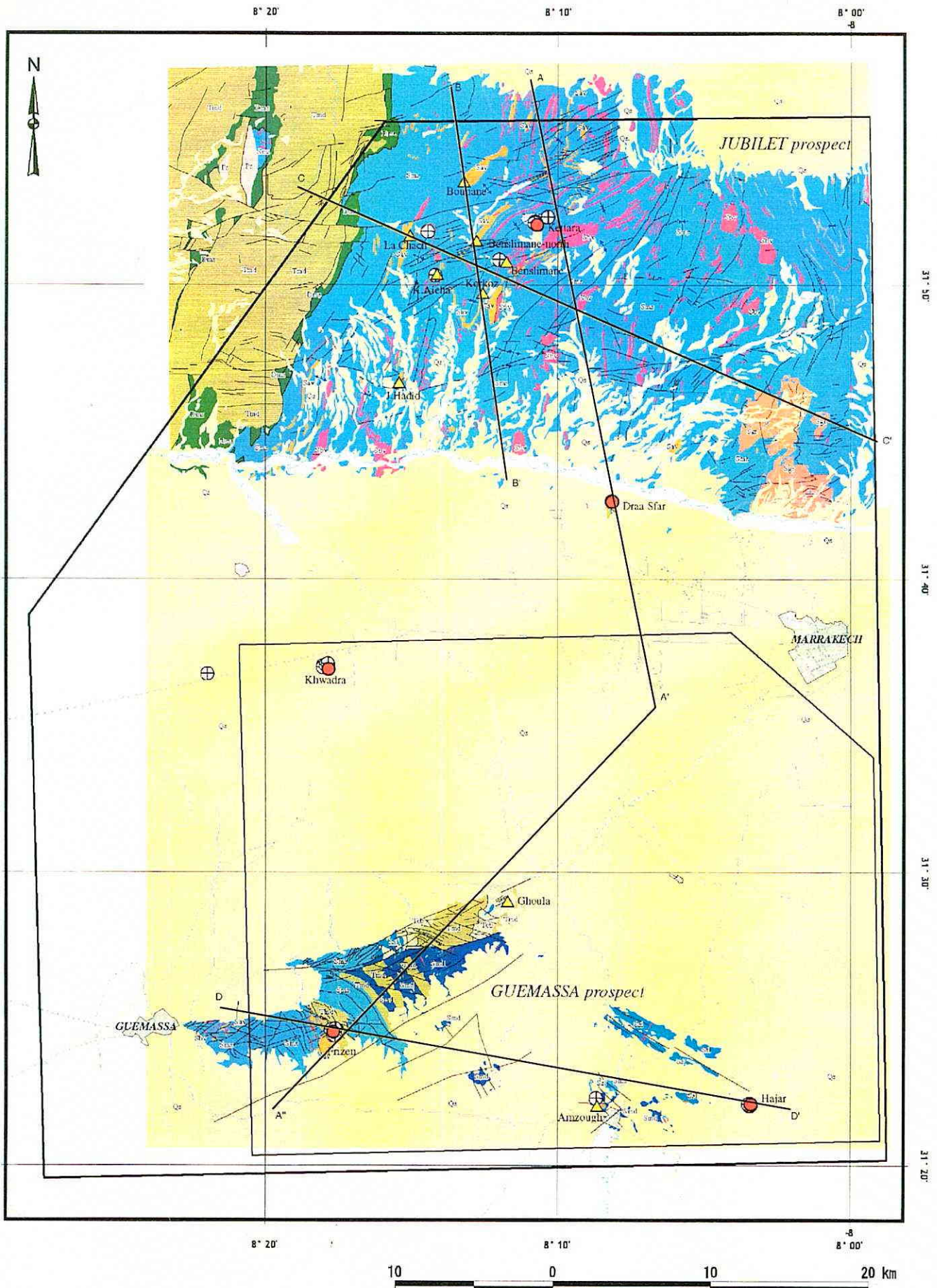
Chapter 4 Integrated Interpretation

4-1 Geological Structure and Characteristics of Mineralization

The survey area for this year's program is targeting the ore with very poor exposure for Paleozoic outcrop, extensively overlying by the young sediments.

The massive sulfide ore deposits are in the Paleozoic terrain in the surrounding area, and they are of stratiform, massive, and lenticular forms. The ore is mainly composed of pyrrhotite, pyrite, sphalerite, galena, and chalcopyrite. The acidic and basic pyroclastic rocks are distributed in the surrounding area. The rhyolite and rhyolitic pyroclastic underlie the ore body, containing visible quartz phenocrysts. The rocks are hard due to metamorphism. The black to dark gray color of the rocks is different from the footwall dacite of the Japanese Kuroko ore. The rich calcite content in the hanging-wall mudstone is different from the hanging-wall mudstone, rather resemble to the Mesozoic hanging-wall mudstone in Mexico.

Noticing these stratigraphic relations, the principal dipping direction of the main ore deposits in the surrounding area is south-southwest in the Kettara Deposit, west in the Draa Sfar Deposit, east-southeast in the Khwadra Deposit, north in the Hajar Deposit, and northeast in the Frizem Deposit. It forms something like synclinal structure. This year's survey area is in the bottom position of the so-called synclinal structure as shown in Figure I-4-1.



Geology		Deposit type	
A	Alluvion	● VMS	⊕ Drilling point
Qs	Quaternaire / Quaternary rocks	▲ Gossan	⋈ fold
Pc	Permien	— section (Fig. I -3-3)	
Tmd	Triplicien Fm. / Black shale		
Tcb	Triplicien Fm. / Carbonate rocks		
Ssl	Saïf el Fm. / Slate	Dms	Dévonien / Black shale
Ssm	Saïf el Fm. / Limestone	Vb	Vélocité breccia
Sms	Saïf el Fm. / Sandstone, black shale interstr.	IG	Graze
Sgr	Saïf el Fm. / Grés, grés microlite		
Sav	Saïf el Fm. / Argile volcanique		
Sbv	Saïf el Fm. / Basaltes / Basaltes		
Smd	Saïf el Fm. / Black shale		

Fig. I -3-1 Existing geological map of the project area in Morocco

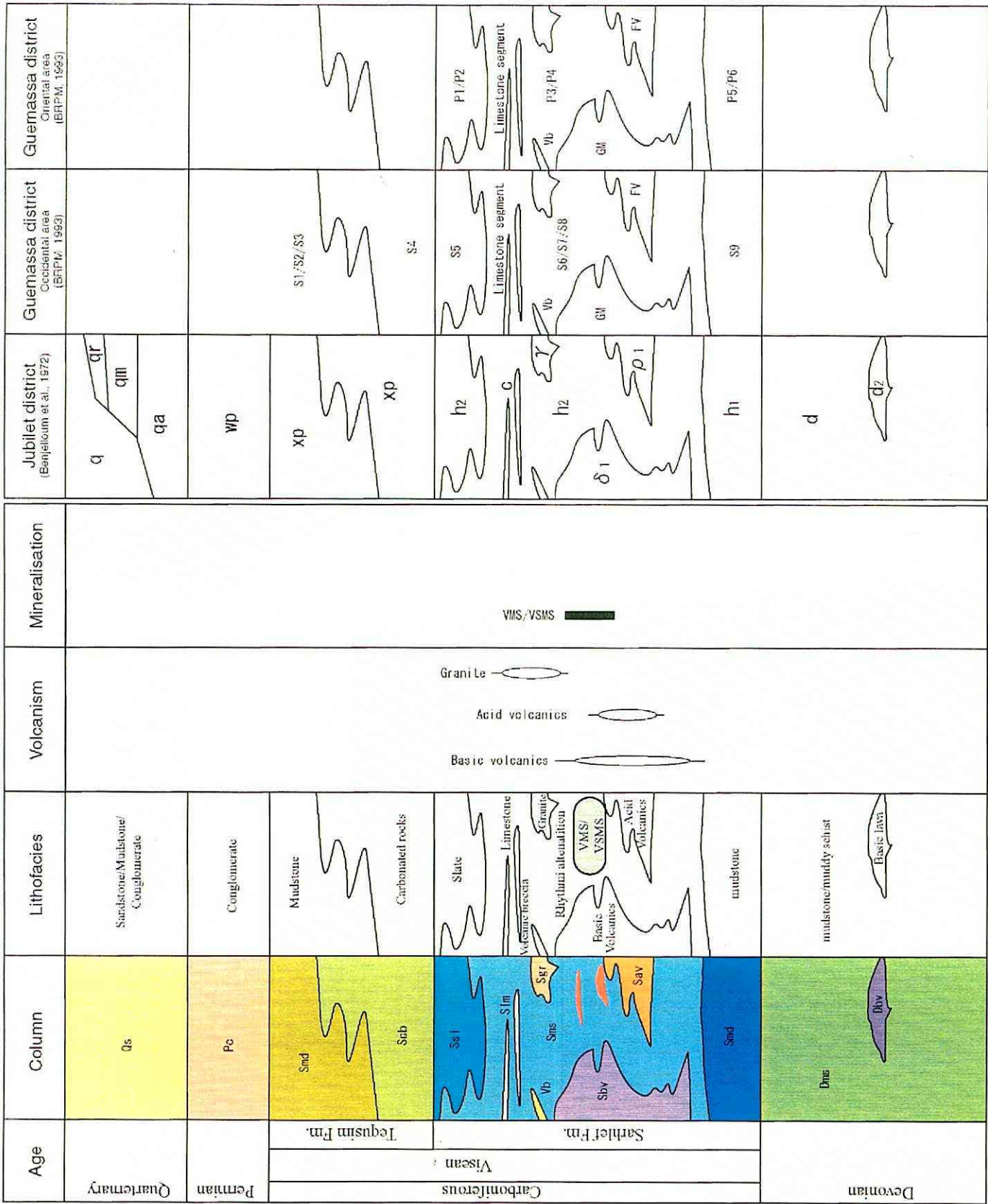


Fig. I -3-2 Geological stratigraphic columnar section of the project area in Morocco

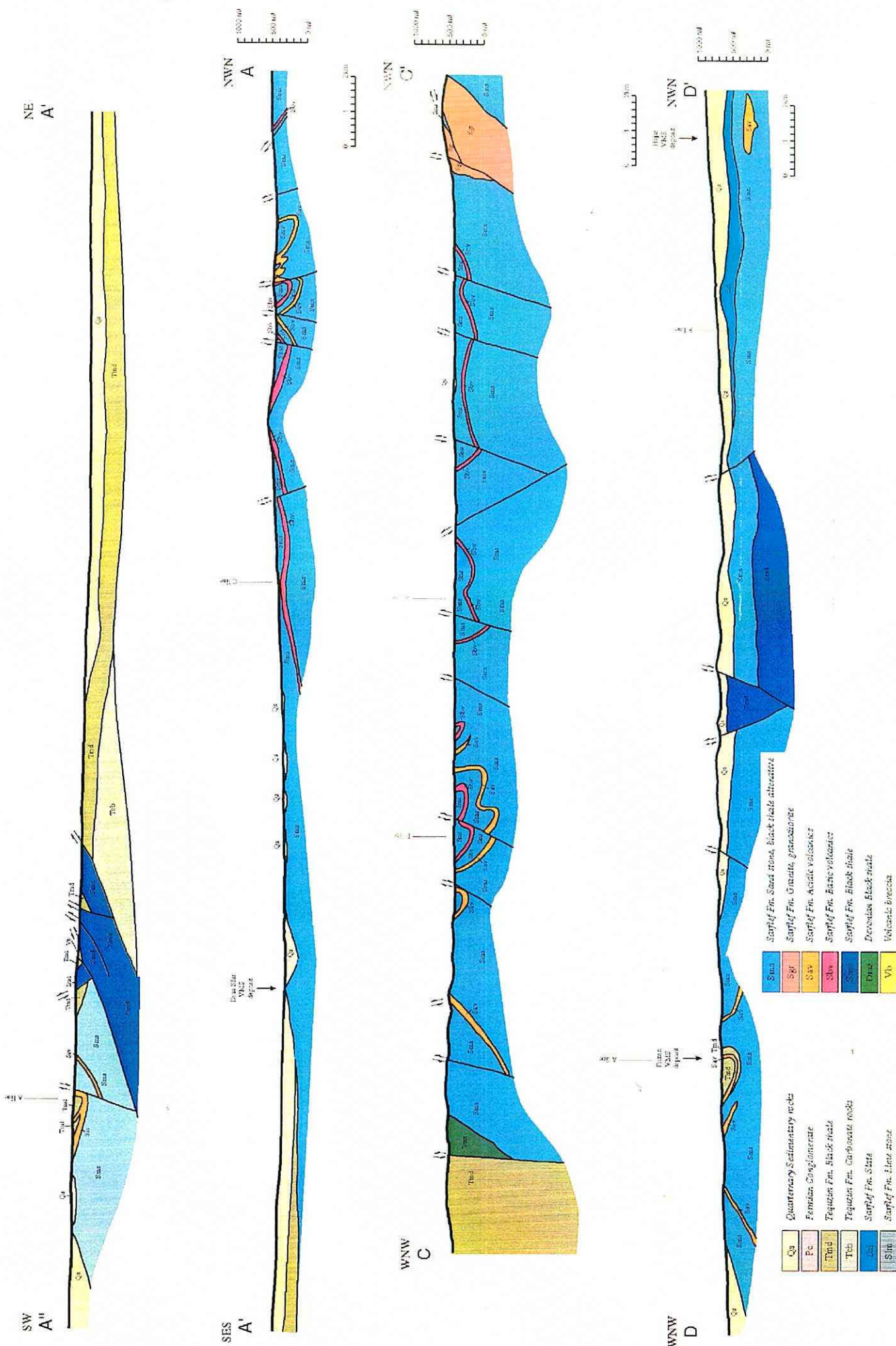


Fig. I -3-3 Geological section of the project area in Morocco

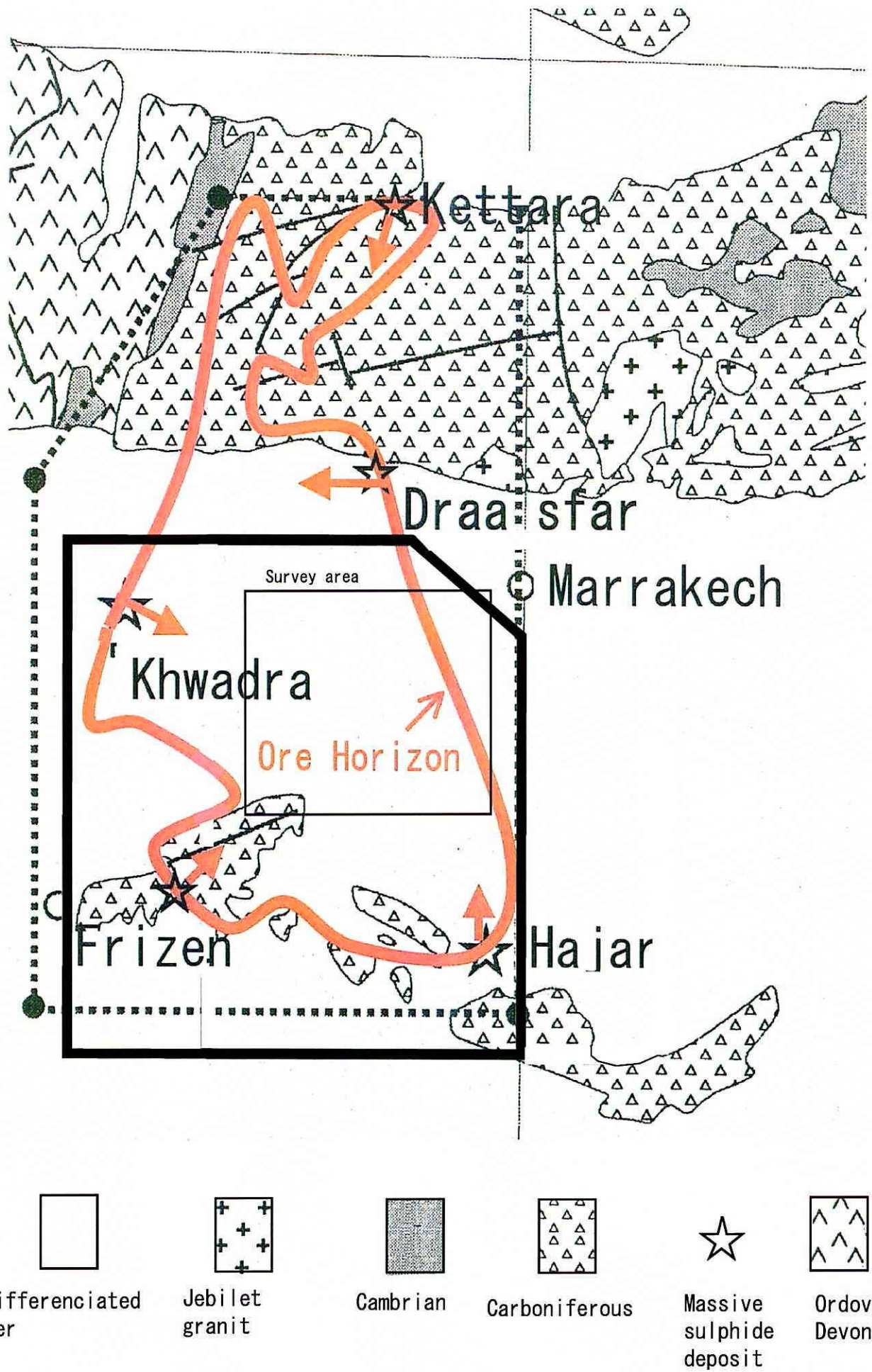


Fig. I -4-1 Regional structure and distribution of ore deposits

4-2 Geophysical Anomaly and Mineralization

The electric prospecting IP method has been applied in the eight districts near Marrakech City, and has revealed an IP anomaly zone, high chargeability zone, in the MJTK-IP-1 district. The MJTK-IP-6 and MJTK-IP-7 districts are underlain by thick young sediments, therefore, its geological environment of the deep part is unsure. The other districts have not indicated any positive data for potential.

The survey program by electromagnetic prospecting TEM method has been performed in the MJTK-IP-1 district following the IP survey result. In the Paleozoic underneath the young sediments in the MJTK-IP-1 district, virtual high resistivity zones have been detected at the 400 meters level in the northwestern area and at the 350 meters level in the central north area. These are corresponded with the IP anomalies founded by the preceding survey. It is judged that these anomalies indicate some sulfide mineralized zones or disseminated zones.

BRPM has performed a ground magnetic and gravity survey following the result of the TEM survey in the MJTK-IP-1 district. As a result of these surveys, a clear high gravity anomaly has been detected in the central district. A positive magnetic anomaly in the south side and a negative magnetic anomaly in the north side, therefore, it is judged that some high density and magnetic material exists there. The magnetic anomaly is basically coincident with the airborne anomaly founded by the last year's survey, accordingly it suggests that some highly magnetic massive sulfide ore deposit exists there, in spite of some unclear points remain there.

4-3 Potential for Ore Deposits

Judging from the result of the geophysical prospecting, it is evaluated that the MJTK-IP1 district shows high potential for ore deposit. Following points, however, are not clear at present.

1) The duplicated zone of the paired positive-negative magnetic anomaly and the high gravity is correlated to some igneous body, possibly rhyolite disseminated by pyrrhotite, or mineralized zone, however, it is not quit sure.

2) The IP anomaly zone (high chargeability zone) is distributed surrounding the high gravity zone, and its exact position is slightly apart from the magnetic anomaly zone.