

**REPORT ON THE MINERAL EXPLORATION
IN
THE MARRAKECH-TEKNA AREA
THE KINGDOM OF MOROCCO
PHASE II**

MARCH 2004

**JAPAN INTERNATIONAL COOPERATION AGENCY
JAPAN OIL, GAS AND METALS NATIONAL CORPORATION**

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PREFACE

The Japanese Government decided to conduct a mineral exploration program consisting of geological, and geophysical surveys in the Marrakech-Tekna area situated in the central-west of Morocco, in response to the request from the government of the Kingdom of Morocco. The purpose of the program is to estimate its potential for mineral deposits. The Japanese Government entrusted the implication of the plan to the Japan International Cooperation Agency (JICA, presently independent administrative corporation Japan International Cooperation Organization), and JICA entrusted the enforcement of the program to the Japan Oil, Gas and Metals National Corporation (JOGMEC) due to the specialty of the program.

JOGMEC (MMAJ) started the survey program for the send year in the fiscal year of 2003, and dispatched a survey team to Morocco from August 31 to October 16, 2003.

The field survey program in the area has completed as scheduled in cooperation with the Bureau of Mineral Research of Morocco (Bureau de Recherches et de Participations Minières).

This report describes the result of this year's survey, and contributes a part of the final report. Finally, we would like to express a deep appreciation for the cooperation of the concerned governmental organizations of Morocco, departments of Foreign Affair, and Economy and Industry of Japan, Embassy of Japan in Morocco, and many other cooperators.

March 2004

Hidehiro Ohsawa

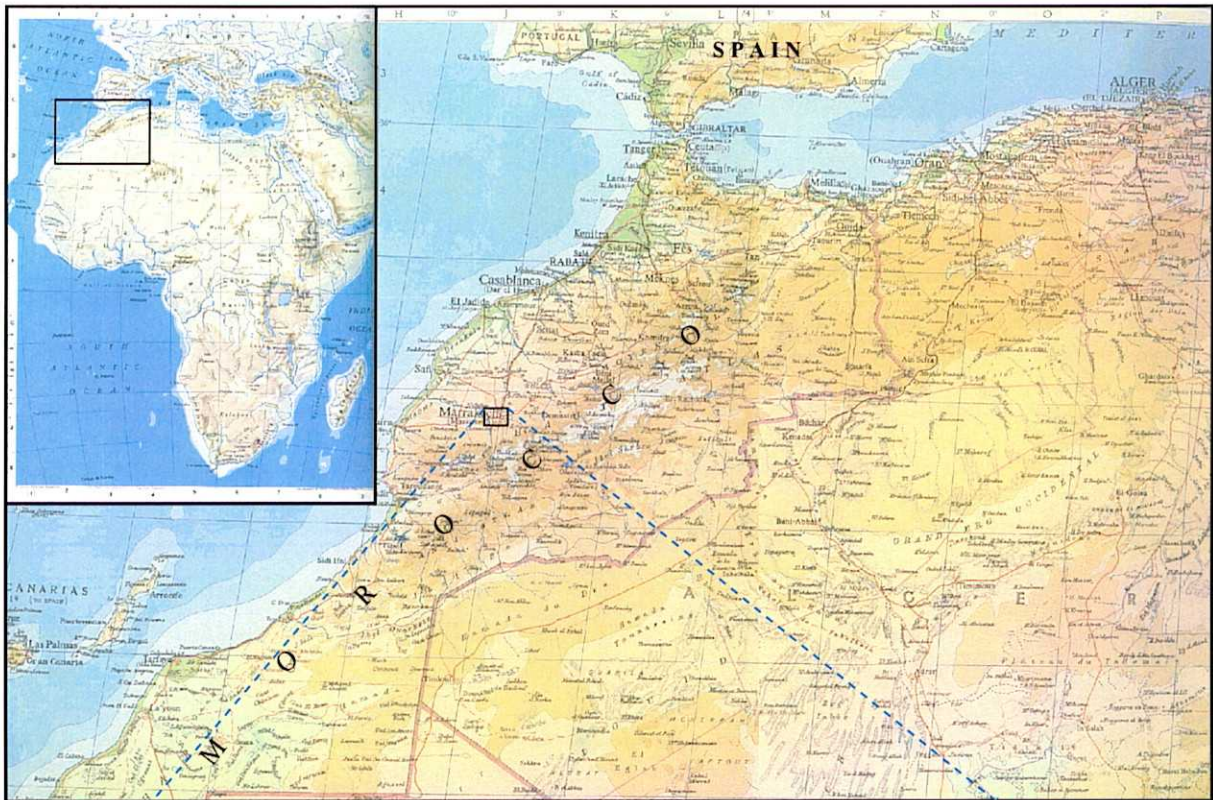
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BY:TIMES BOOKS

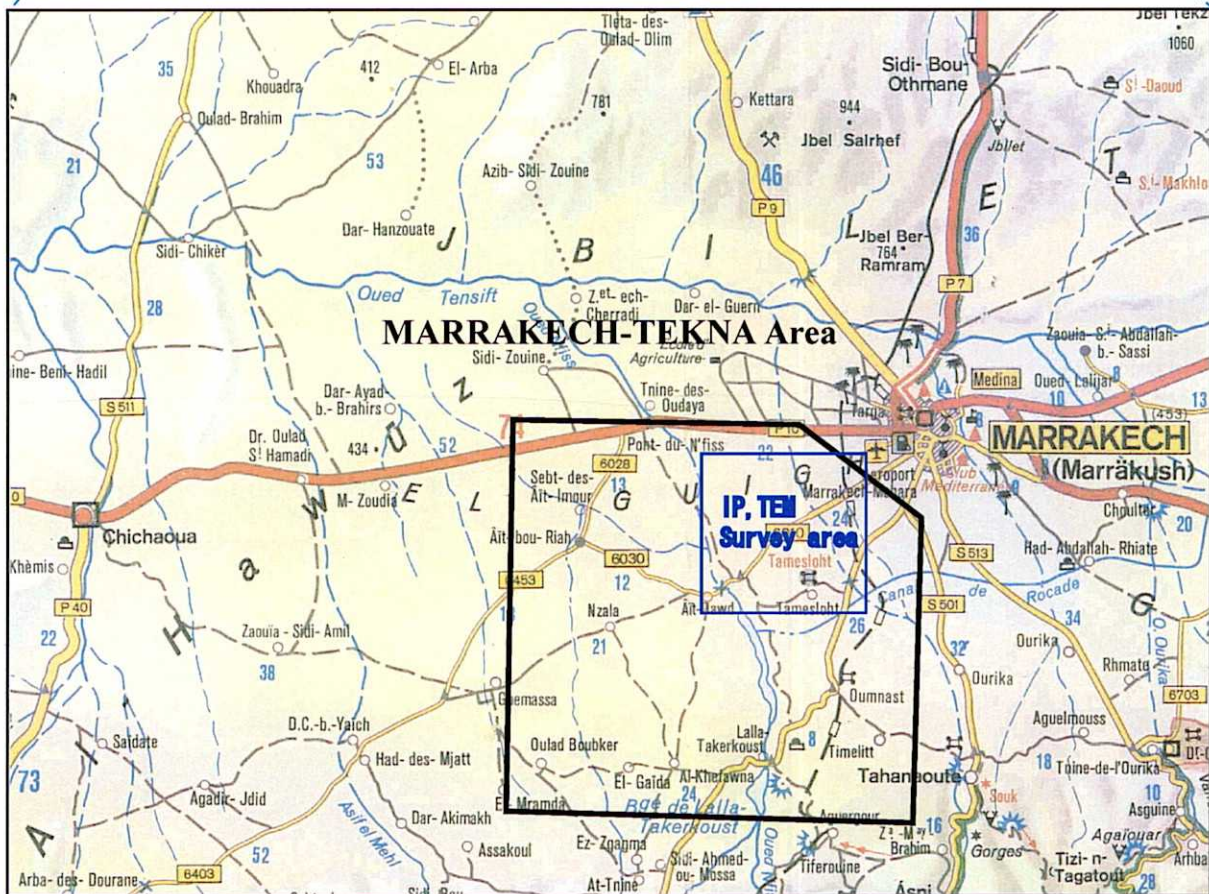


Fig.1 Location map of the project area in morocco

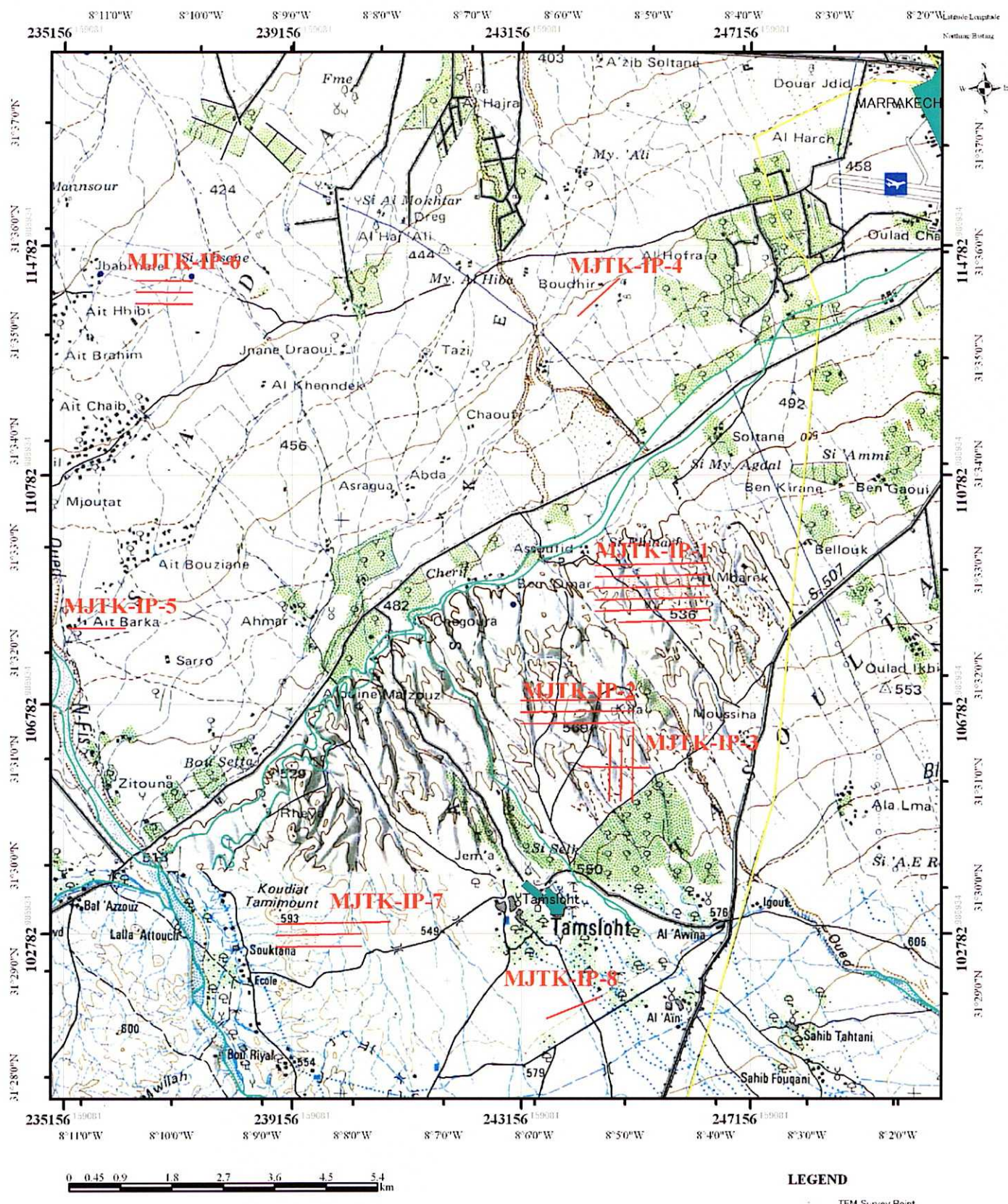


Fig.2 Location map of the survey area in Marrakech-Tekna area

ABSTRACT

Summary

The survey has been performed in the Marrakech-Tekna area in the Kingdom of Morocco to extract high potential areas for the volcanogenic massive sulfide ore deposits being principally composed of copper, lead, and zinc minerals, through surveys and interpretation of geological environment and distribution of ore deposits. In addition to this, another object of the program is to transfer the concerned technology to the counterpart organizations.

This year's program, as the second year program, has been conducted in areas showing magnetic or conductivity anomalies in the first year's program. The electrical IP method and electromagnetic TEM method have been applied in the program.

The electric IP method has been applied for eight areas near Marrakech City. Much time has needed for the measuring due to the broad area underlain by the younger sediments and noise obstruction caused by artificial material such as well pumps. The problem has been solved by high power current output, and useful data have been obtained. The survey result has revealed that some IP anomalies exist in the MJTK-IP-1 district. It is thought that the thick young sediments underlie the MJTK-IP-6 and MJTK-IP-7 districts. In the other districts, no data indicating some mineralized zone has been obtained.

The electric prospecting TEM method has been performed with emphasis on the MJTK-IP-1 district, following the electric prospecting IP survey result. The result of this survey has revealed that the thick young sediments exist about 150 meters thick in MJTK-IP-1, over 200 meters thick in MJTK-IP-6, and 250 meters thick in MJTK-IP-7. In the MJTK-IP-6 and MJTK-IP-7 districts, the banded resistivity structure is corresponded with the stratification of the young sediments. In the MJTK-IP-1 district, it is thought that the young sediments gently dip to the northeast. The analytical resistivity structure of the Paleozoic rocks is not actually correlated with the resistivity of rocks in situ due to some affection from the IP effect, showing some virtual resistivity zone. The intense IP effect seen in the electromagnetic prospecting TEM method corresponds the chargeability anomaly zone in the electric prospecting IP method.

BRPM has conducted ground magnetic and gravity surveys following the TEM survey in the MJTK-IP-1 zone. The survey program has revealed that a clear high-gravity zone is in the central MJTK-IP-1 zone, and a positive magnetic anomaly exists on the south side and a negative magnetic anomaly on the north side, suggesting some potential for compact and magnetic material.

Based on the above-mentioned result, following two potential zones can be introduced.

- 1) An igneous body, probably rhyolite disseminated by pyrrhotite, exists near the No.8 point of the survey line C in the central MJTK-IP-1 district. The chargeability anomaly zone surrounds north

side of the igneous body, and corresponds with some mineralized or disseminated zone. The paired positive and negative magnetic anomaly and high gravity part is correlated with some igneous body.

- 2) A steep dipping, massive to stratified, large-scale subsurface sulfide ore deposit exists in the central district. The chargeability anomaly zone surrounds the ore body. The paired positive and negative magnetic anomaly and high gravity part corresponds with some ore mainly composed by pyrrhotite.

The drilling survey (2 holes) was carried out in order to inspect each possibility, and to know the property of the mineralization zone.

As the result, it was shown that the situation of the basement resembles 1), and that it was recognized that the magnetic anomaly of the central part of this area was caused by an intrusive gabbro, a kind of igneous rock.

And a lot of small veins including sphalerite were found in the pelitic and psamitic schist in MJTK-1 that is at the East of the gabbro of MJTK-2.

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