

Part I General

Chapter 1 Introduction

1-1 History and Object

The first year survey program was performed based on the scope of works (S/W) and the minutes of meeting (M/M) signed on September 17th, 2002. The object of the program is 1) to extract some potential zones for the volcanogenic massive sulfide ore deposit, mainly composed by copper, lead, and zinc minerals, by mean of geological survey and interpretation, and investigation of mineralized zones, and 2) to transfer the concerned technology to the counterpart organizations.

Following facts have been revealed in the first year's survey result.

- 1) The existing ore deposits, Khwadra, Draa Sfar, Kettara, Hajar, and Frizen are of the massive sulfide type hosted in the alternation of muddy rock and sandstone, alternation of muddy rock and chart, and acidic volcanic rocks of the Visean Sarhlef Formation in the Jebilet and Guemassa Districts.
- 2) These deposits show layered, massive, lenticular, and banded forms, and are composed of pyrrhotite, pyrite, sphalerite, galena, and chalcopyrite.
- 3) Acidic and basic volcanic rocks associating with the mineralization are distributed around the ore deposits.
- 4) There exist three types of mineralization, the "early stage I mineralization" represented by hexagonal pyrrhotite and "early stage II mineralization" represented by monoclinic pyrrhotite showing strong magnetism, and the "later stage mineralization" represented by pyrite.
- 5) The massive sulfide ore deposits are classified into a) the "early stage I dominant type" showing medium magnetic anomaly due to duplication of the early stage and later stage mineralization (Draa Sfar Deposit), b) the "early stage I + later stage duplicate type" showing medium to low magnetic anomaly (Frizen and Kettara Deposits), c) the "early stage II + later stage duplicate type" showing high to low magnetic anomaly (Khwadra and Hajar Deposits).
- 6) There exists some potential for weak magnetic massive sulfide lead and zinc ore deposits in the medium to weak anomalous zones.

Following the above-mentioned result, the airborne geophysical survey for the target area was performed, and revealed several significant airborne anomalies. In addition to the high magnetic anomalies indicating intensely magnetic pyrrhotite, following anomalous zones have been extracted for the second year program, considering the potential for some mineralized zone showing medium to low magnetic anomalies.

- 1) Low resistivity + high to medium magnetic anomaly zone: for the potential of high magnetic massive sulfide ore deposit.
- 2) High magnetic anomaly zone: for the potential of high magnetic massive sulfide ore deposit.
- 3) Low resistivity zone: for the potential of medium to low magnetic massive sulfide ore deposit.

The electric IP method has been applied for the second year's program. The target zones selected based on the result of the first year's program have been investigated by the IP method to detect IP anomalies associating with some mineralization and geological structure. Following the IP survey, the electromagnetic TEM have been applied to estimate their location and shape of the extracted IP anomalies. The drilling targets for further exploration have been extracted based on the first and second year's survey result. The concerning exploration technic is transferred to the counterpart organizations through the survey and interpretation.

1-2 Survey Area and Outline of Work

As shown in Figure 1, the survey area is in the central part of Morocco, about 330 kilometers south of the capitol city, Rabat, north of the Atlas Mountains, and southwest of Marrakech. The area is in an area latitude 31 degrees 19 minutes to 31 degrees 38 minutes north, longitude 8 degrees 01 minute to 8 degrees 24 minutes west. The eight districts have been investigated by the electric prospecting IP method, and the three districts have been tested by the electromagnetic TEM method. Table I-1-1 shows these districts.

Figures I-1-1 and I-1-2 show the survey lines for the electric prospecting IP method on the maps shown the last year's airborne magnetic and electromagnetic survey results.

Table I-1-1 Survey contents and amount of works

Electric survey (IP method)

District	Line	Line kilometer	Points	Remarks
MJTK-IP-1	A	2.0	80	E-W direction
	B	2.0	80	E-W
	C	2.0	80	E-W
	D	2.0	80	E-W
	E(a-north)	2.0	80	E-W
	F(d-south)	1.6	60	E-W
MJTK-IP-2	A	2.0	80	E-W
	B	2.0	80	E-W
	C	2.0	80	E-W
MJTK-IP-3	A	1.2	40	N-S
	B	1.3	45	N-S
	C	1.2	40	E-W
	D	1.3	45	N-S
MJTK-IP-4	A	1.0	30	NE-SW
MJTK-IP-5	A	1.0	30	E-W
MJTK-IP-6	A	1.0	30	E-W
	B	1.0	30	E-W
	C	1.0	30	E-W
MJTK-IP-7	A	1.5	55	E-W
	B	1.5	55	E-W
	C	1.5	55	E-W
	A-200	1.6	20	E-W、Intervals:200m
MJTK-IP-8	A	1.0	30	E-W
Total		35.1	1,235	

• Electromagnetic survey (TEM method)

Area name	Number of stations	Length of survey lines	Spacing (m)
MJTK-IP1	104	N-S 9 lines 4050m	50
		E-W 1 line 2000m	100
MJTK-IP6	9	E-W 1 line 800m	100
MJTK-IP7	26	N-S 1 line 400m	50
		E-W 1 line 1800m	100
Total	139	9050m	

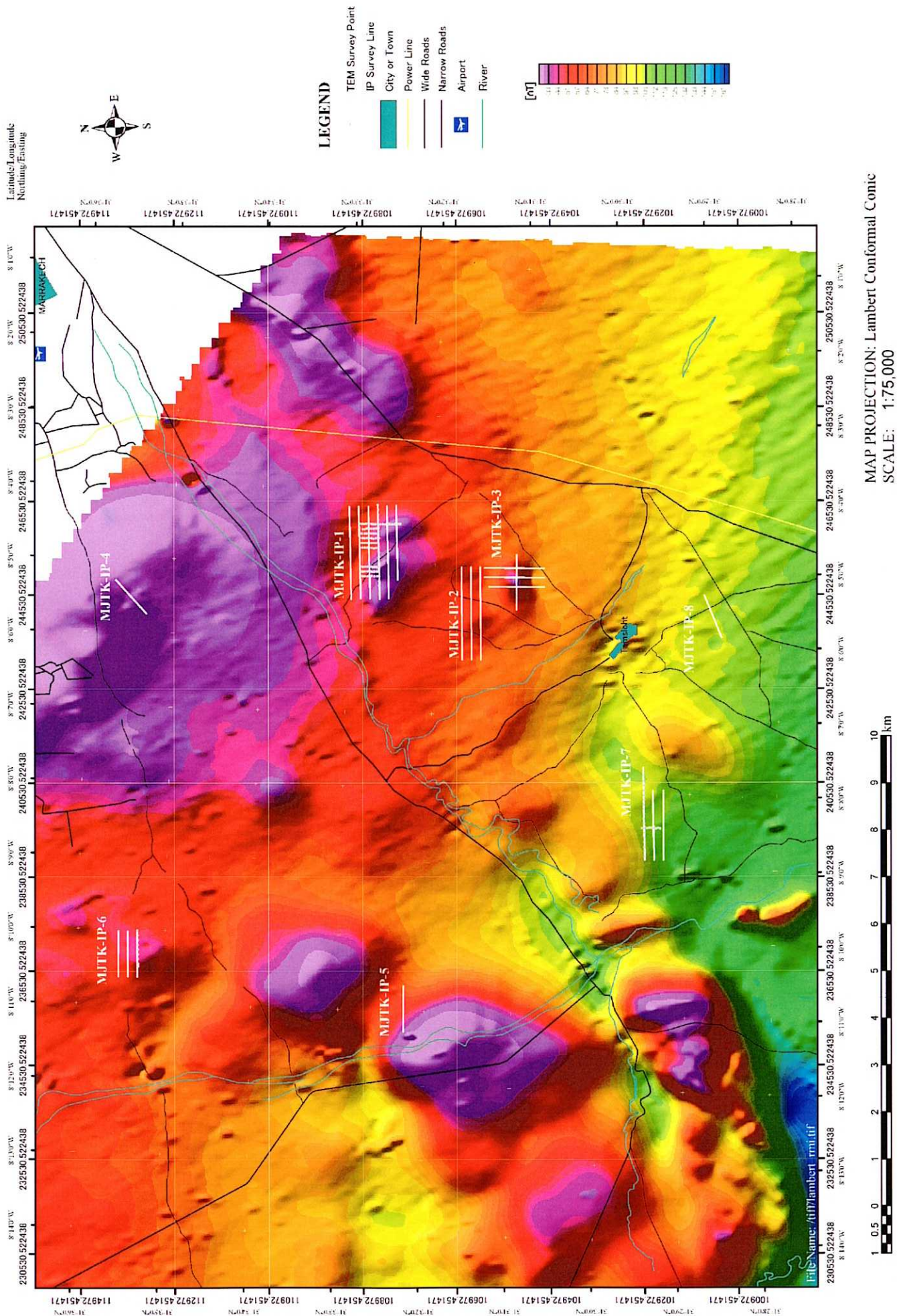


Fig. I -1-1 Residual magnetic intensity and IP survey line

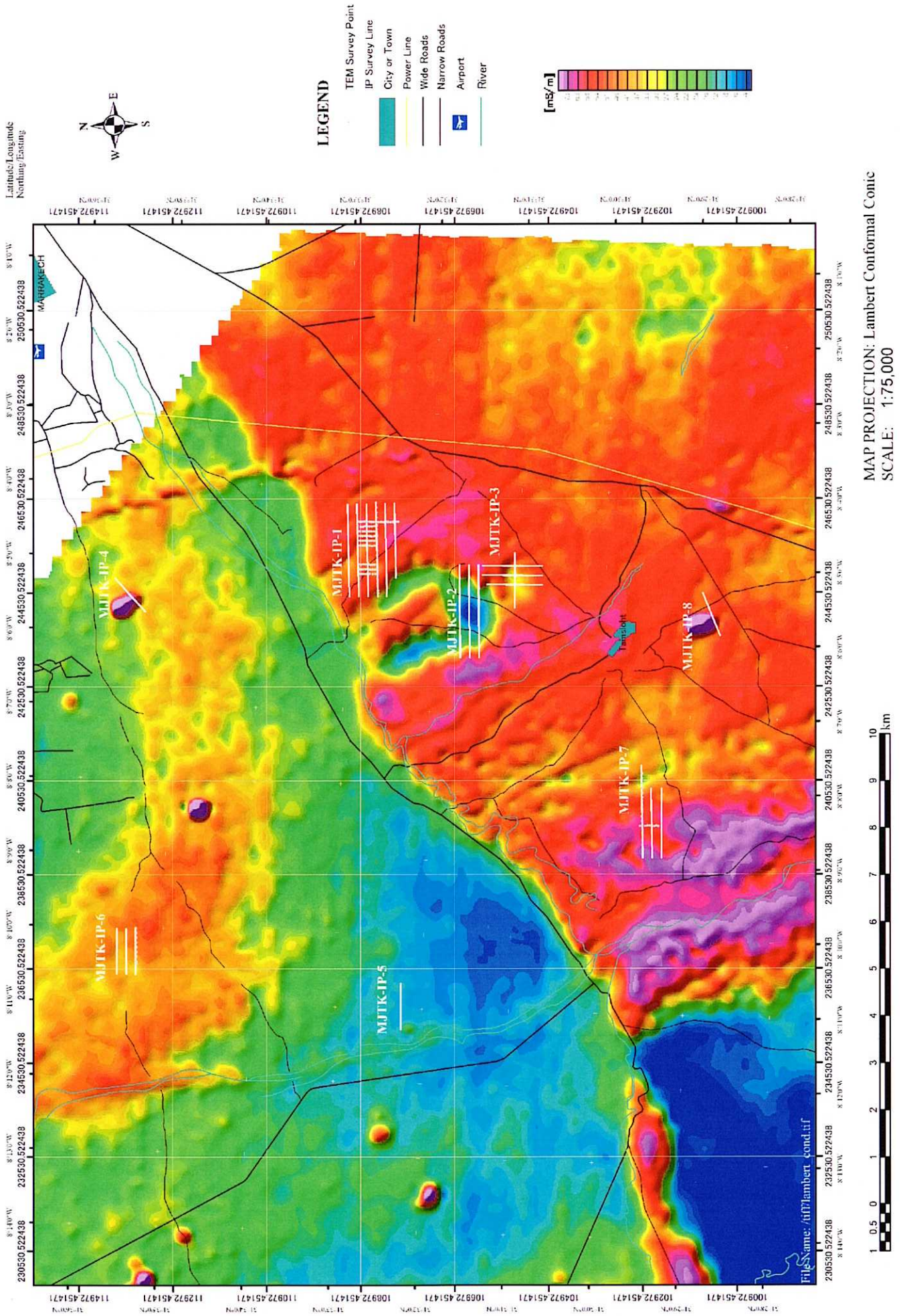


Fig. I -1-2 Apparent conductivity and IP survey line

1-3 Survey Team

The members of the survey team are as follows.

• Geophysical survey

Japanese side

Junichi Ishikawa	Geotechnos Co. Geoscience Department
Kurarei Iwaki	Geotechnos Co. Geoscience Department
Hidehiro Ishikawa	Geotechnos Co. Geoscience Department
Yoshiaki Ogawa	Geotechnos Co. Geoscience Department
Katutoshi Maekawa	Geotechnos Co. Geoscience Department

Moroccan side

El Bachir BARODI	Directeur de l'Exploration, Bureau de Recherches et de Participations Minières: BRPM
Hassan MAZNOUDI	BRPM
Abdallah	BRPM
N'hamed ANNICH	BRPM
Mohamed NAJAH	BRPM
Ahmed KORCHI	BRPM
Lahcen HMAIDOUCH	BRPM
Mustapha CHAIB	BRPM
Said QASRI	BRPM
Mohamed EL YAGOUBI	BRPM
Mohamed IDRISSE AZAMI	BRPM
Zakaria JIRARI	BRPM
Driss DRISSE	BRPM
Abdallah MEKKAOUI ALAOUI	BRPM

Inspector

Kiyoshi Kubota	Overseas Cooperation, Survey Department Metal Mining Agency of Japan
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• Drilling survey

Japanese side

Junichi Ishikawa	Geotechnos Co. Geoscience Department
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Moroccan side

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M'hamed ANNICH	BRPM

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Mustapha CHAIB	BRPM
Mohamed NAJAH	BRPM
Ahmed KORCHI	BRPM
Said QASRI	BRPM
Ali El OUZZANI	BRPM
Houcine ABARBACH	BRPM

Inspector:

Hiroshi KUBOTA	Exploration Team2, Metal Exploration Group, Japan Oil, Gas and Metals National Corporation
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1-4 Survey Period

The geophysical survey in the field has been performed from August 31 to October 14, during a period of 45 days.

The inspector has stayed in the field from August 31 to September 10.

The terms of drilling survey are as follows.

Local stay period: From December 16, 2003 to February 13, 2004.

Grilling period: From December 24, 2003 to January 28, 2004.

Observation of rock core: From December 29, 2003 to February 12, 2004.