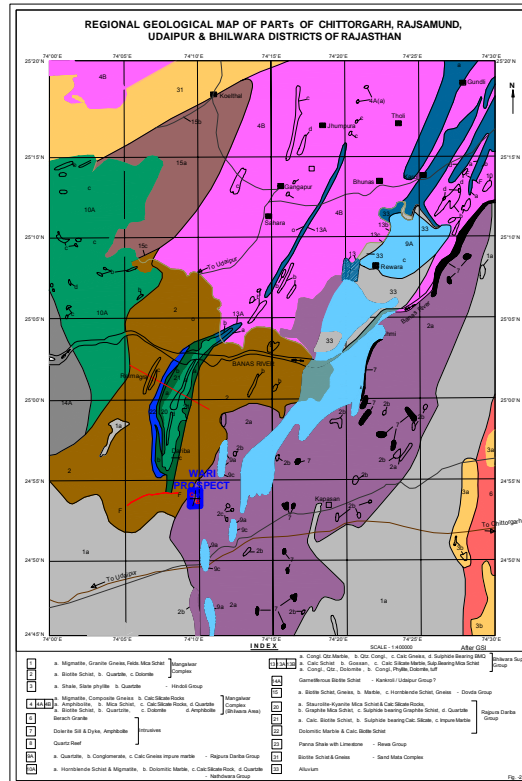


**GEOLOGICAL REPORT  
ON DETAILED EXPLORATION FOR COPPER ORE IN  
WARI AREA (PHASE-I)  
DISTRICT- CHHITTAURGARH, RAJASTHAN  
EXECUTIVE SUMMARY**



**MINERAL EXPLORATION CORPORATION LIMITED**  
(A Government of India Enterprise)  
**Dr. Babasaheb Ambedkar Bhavan,**  
**High Land Drive Road, Seminary Hills,**  
**NAGPUR-400 006**

**DECEMBER- 2010**

# DETAILED GEOLOGICAL REPORT ON EXPLORATION FOR COPPER ORE IN WARI AREA (PHASE-I), DIST: CHITTAURGARH, RAJASTHAN

## EXECUTIVE SUMMARY

### 1.0 INTRODUCTION

Wari Prospect is located in Survey of India Toposheet No. 45 L/1 between Latitude: 24° 53' 30.8"N : 24° 53' 58.6"N and Longitude: 74°09'39.0" E & 74°09'51.3" E : 74°10'03.5" E (B'-block) and Latitude: 24° 53' 58.6"N : 24° 54' 27.9"N and Longitude: 74°09'23.3" E : 74°09'46" E (C-block). The prospect is about 3 km west of Wari village and 5 km southeast of Rajpura-Dariba Mine of HZL. Bhupalsagar is the nearest railway station of west-central railway is about 6 km from the prospect. Bhupalsagar is 70 km east of Udaipur on Chittorgarh-Udaipur State highway.

### 2.0 GEOLOGY AND STRUCTURE

#### GEOLOGY OF THE AREA

The Wari prospect is located in the north-central part of 70 km long NS trending Proterozoic metasediments of Panchmata-Bhinder Belt and almost in the south-eastern part of Dariba-Bethumbi-Surawas polymetallic belt. Ray et. al (1994) of GSI, carried detailed mapping in the area. The generalised geological succession as modified by S.S. Ameta et. al is given below.

#### Stratigraphic succession of the area

	Gossan
	Vein Quartz
	Dolerite/meta dolerite dyke
Rajpura Dariba Group	<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 10px;">}</div> <div> <p>Carbonaceous schist (Staurolite, Kyanite) with Marble/Dolomite and Sulphide bands.</p> <p>Tuffaceous-calcareous-carbonaceous schist bands (±Graphite, Kyanite, staurolite) with calc. silicate, Marble/Dolomite and sulphide bands.</p> <p>Dolomite marble-schist, meta marl-amphibolite bands, Quartzite, psammite and amphibolite bands Conglomerate.</p> </div> </div>
----- Unconformity -----	
Mangalwar Complex	: Feldspathic and psammitic gneisses with migmatites and schist.

(After GSI)

Note: Litho-units indicated in Basement Mangalwar Complex have not been intersected in the drill holes drilled by MECL.

Major part of the block is covered by thick soil/over burden. Rock exposures are scanty. Drilling has revealed that the area is underlain dominantly by Garnetiferous mica schist with numerous thin bands of amphibolite, impure marble, calc silicate rocks and quartzites. Stratigraphic correlation is difficult and uncertain due to paucity of exposures. However, the country rock is probably referable to the Pre-Aravalli (Pre-Cambrian) middle schist unit of the litho-sequence of Rajpura-Dariba area.

### **STRUCTURE OF THE BLOCK**

The Blocks A, B, C & D of Wari area forms the part of eastern limb of the synclinorium. In the blocks 'B' & 'C' considered for detailed exploration, litho-units show changing strike as SW with northwesterly dips of 50° to 73° in the southern portion, where as the strike changes to NW with south easterly dips of 50° to 83° in the northern portion of 'B' Block, plunging 69° in WNW direction. With the gap of about 300 m in the southern portion of 'C' block strike is SSW dipping 70° to 88° in the WNW direction. However, the strike changes to NNW dipping WSW direction with dips of 62° to 71° in the northern portion of 'C' block, plunging 66° easterly.

### **3.0 MINERALISATION**

In Wari block, extensive old working chains in the form of shallow trenches and pits observed as Surface manifestation of mineralisation. The mineralization in the area is of copper with traces of Nickel and Cobalt. The ore mineral is chalcopyrite associated with pyrite and locally Pyrrhotite which occurs as follows:

- (i) Chalcopyrite in the form of dissemination or massive segregation, parallel to  $S_0$  in amphibole rich or Quartzose layers but rarely in Garnet-rich layers.
- (ii) Rich chalcopyrite segregation in association with pyrite and Pyrrhotite localised along fractures and interstitial spaces in marble and calc-silicate rocks.
- (iii) Pyrite-chalcopyrite films or encrustations of minute crystals along fractures or foliation ( $S_1$ ) associated with Quartz-carbonate veins.

The main ore of copper is chalcopyrite in these blocks of Wari area

Mineralisation in Wari is largely strata bound in nature, though it is localised along various weak planes at places.

#### **4.0 QUANTUM OF WORK DONE**

MECL has carried out detailed Geological Mapping and topographical Mapping covering 1 sq. km area, 3993.60m of drilling 23 boreholes, 873 NO of Primary & check samples for Cu, 160 NO of Primary samples for Ni & Co and 44 NO of Composite Samples each for Cu, Ni, & Co, and 44 No composite samples for Au, Ag (Fire Assay Method), 44 No of composite samples for Spectroscopic studies (10 elements) and 15 samples for X-ray studies. Petrographic studies on 30 No of samples, Mineralogical studies on 29 No of samples and 33 No of Specific gravity determinations, one sample for beneficiation study and core of one borehole was subjected for Geotechnical studies, one scene environmental studies were also carried out by MECL in the block. Based on the data generated by GSI and above data MECL has prepared Geological Report of the area.

#### **5.0 ORE RESERVE ESTIMATION**

The reserves have been estimated for the lodes at 1.50 m true width as minimum stopping width, 2.00 m minimum parting and 2% Total Metal Content cut-off.

The total reserves estimated by cross section method for 'C' & 'B' blocks of Wari area together is 2.56 million tonnes with 1.09% Cu and Cobalt and Nickel values of 161 ppm and 168 ppm respectively as by-product.

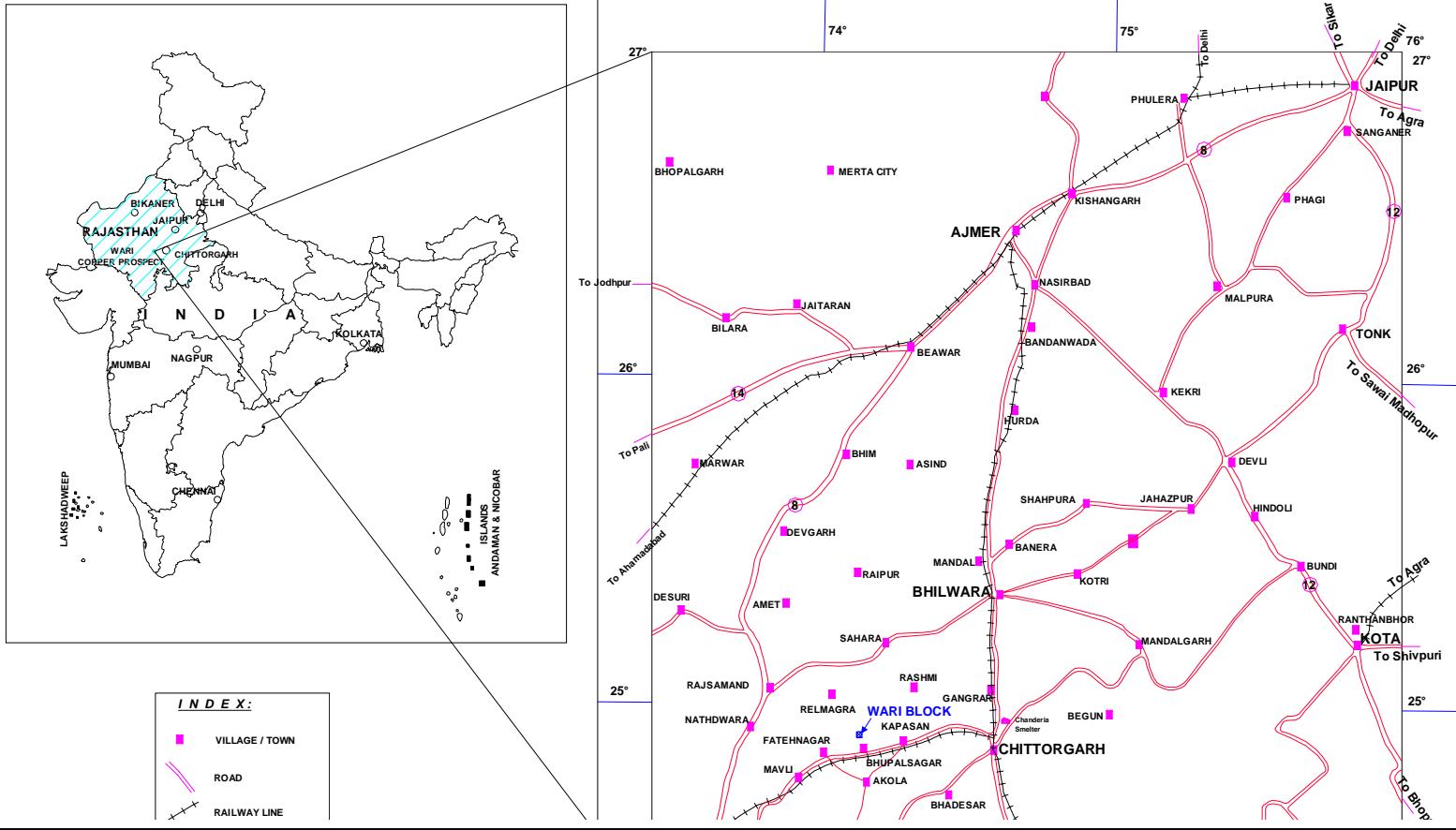
**The Rewara deposit has been classified as Category 'B' of UNFC 332**

The studies on the baseline data on Environmental studies covering Landuse / Land cover pattern have been carried out in the block.

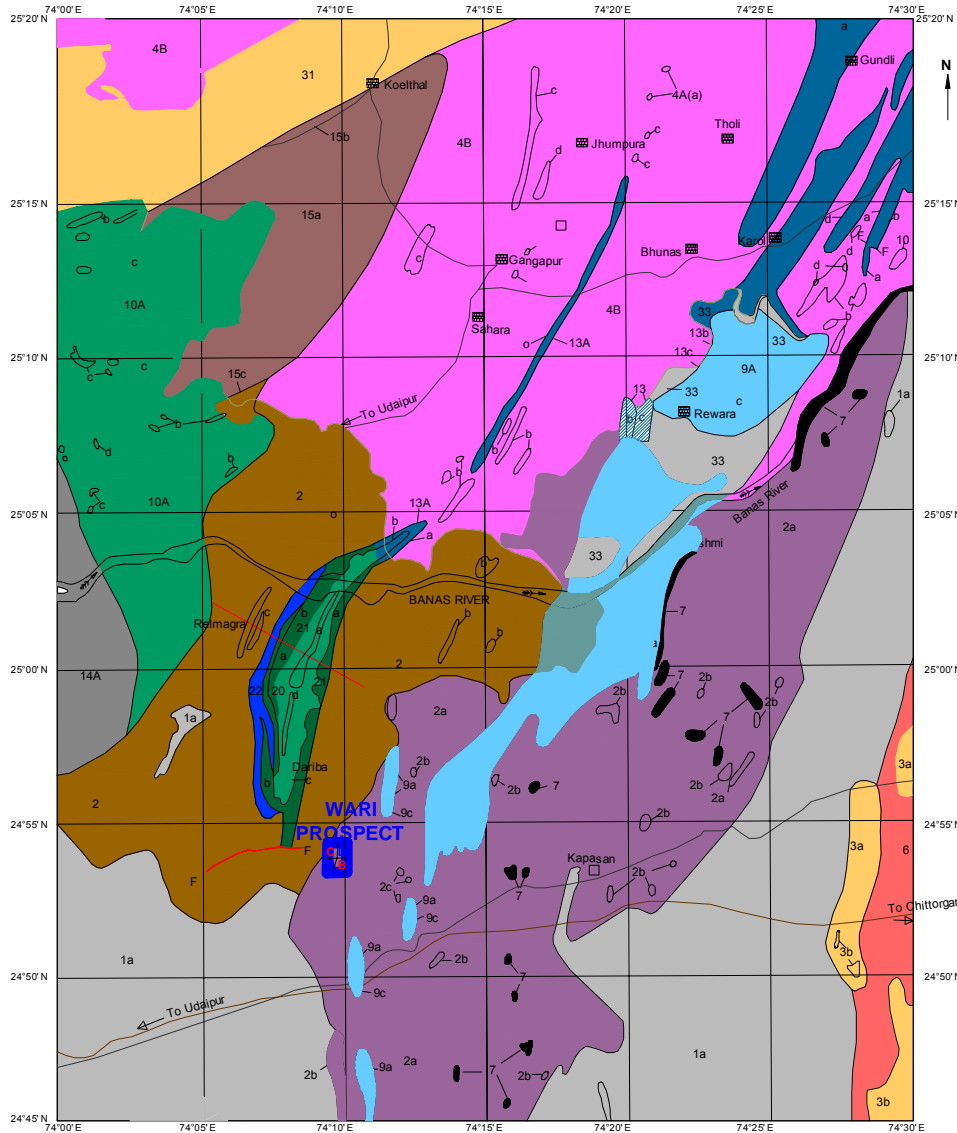
**The Total Cost of Exploration is 376.06 Lakhs.**

**BLOCK LOCATION PLAN  
WARI COPPER PROSPECT  
DIST : CHITTORGARH, RAJASTHAN.**

**Fig. 1**



**REGIONAL GEOLOGICAL MAP OF PARTS OF CHITTORGARH, RAJSAMUND,  
UDAIPUR & BHLWARA DISTRICTS OF RAJASTHAN**



**INDEX**

SCALE - 1:400000  
After GSI

1	a. Migmatite, Granite Gneiss, Felds. Mica Schist	Mangalwar Complex
2	a. Biotite Schist, b. Quartzite, c. Dolomite	
3	a. Shale, Slate phyllite b. Quartzite	Hindol Group
4, 4A, 4B	a. Migmatite, Composite Gneiss b. Calc Silicate Rocks	Mangalwar Complex (Bhilwara Area)
4A	a. Amphibolite, b. Mica Schist, c. Calc Silicate Rocks, d. Quartzite	
4B	a. Biotite Schist, b. Quartzite, c. Dolomite d. Amphibolite	
6	Berach Granite	
7	Dolerite Sill & Dyke, Amphibolite	Intusives
8	Quartz Reef	
9A	a. Quartzite, b. Conglomerate, c. Calc Gneiss impure marble	Rajpura Dariba Group
10A	a. Hornblende Schist & Migmatite, b. Dolomitic Marble, c. Calc Silicate Rock, d. Quartzite	Nathdwara Group
13, 13A, 13B	a. Congl. Qtz. Marble, b. Qtz. Congl., c. Calc Gneiss, d. Sulphide Bearing BMO	Bhilwara Super Group
13A	a. Calc Schist b. Gossan, c. Calc Silicate Marble, Sub. Bearing Mica Schist	
13B	a. Congl., Qtz., Dolomite, b. Congl. Phyllite, Dolomite, tuff	
14A	Garnetiferous Biotite Schist	Kankrol / Udaipur Group?
15	a. Biotite Schist, Gneiss, b. Marble, c. Hornblende Schist, Gneiss	Dovda Group
20	a. Staurolite-Kyanite Mica Schist & Calc Silicate Rocks,	
21	b. Graphite Mica Schist, c. Sulphide bearing Graphite Schist, d. Quartzite	Rajpura Dariba Group
22	a. Calc. Biotite Schist, b. Sulphide bearing Calc. Silicate, c. Impure Marble	
22	Dolomitic Marble & Calc. Biotite Schist	
23	Panna Shale with Limestone	Rewa Group
31	Biotite Schist & Gneiss	Sand Mata Complex
33	Alluvium	

Fig. -2



### GEOLOGICAL CROSS SECTION : CS-5

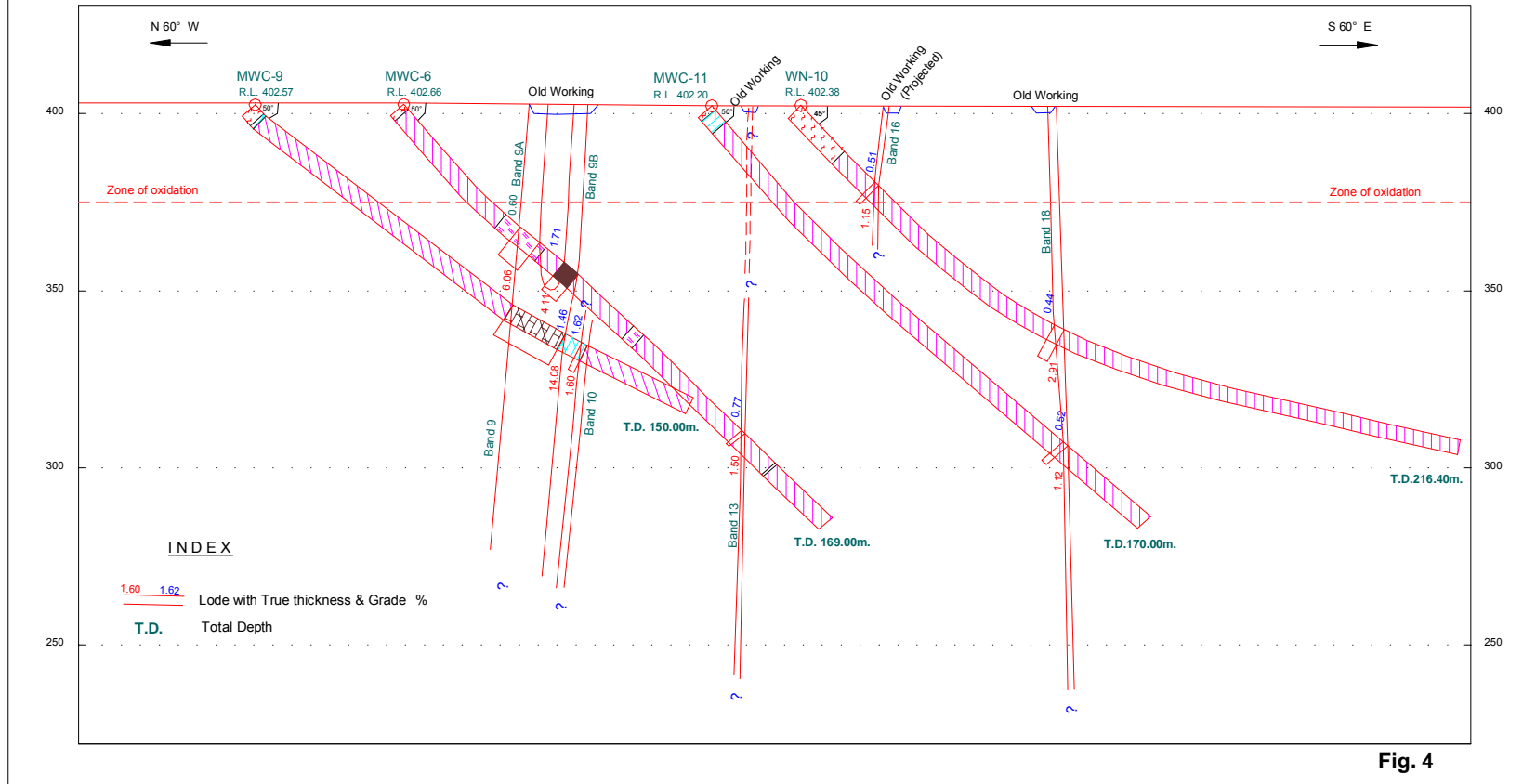


Fig. 4

