

Proposal for Regional Exploration (G-4 level) for Iron in Kanawat-Chala - Karath-Bagholi Area, (Block ID-WR-RAJ-07), in an area of 129 sq.km. District: Jhunjhunu & Sikar, (Rajasthan)

1.0.0 Introduction:

- 1.1.1 Iron has played a vital role in the industrial growth of nation. The increasing demand of Iron for steel manufacture has warranted exploration for Iron in every states of the country to avoid transportation cost of ore/manufactured steel items from different parts of the country. Hence, the exploration for Iron has been accorded high priority in the XIIth Plan document.
- 1.1.2 During the last decade, no deposits for Iron Ore have been discovered in Rajasthan. However, the possibility of working of small mineral bodies in proximity to each other, through technological advances and increased operational efficiency, cannot be ruled out. Therefore, it is necessary to locate and explore such small size deposits in clusters.
- 1.1.3 In view of the MMDR amendments act – 2015, Mineral (Evidence of Mineral Contents) Rule 2015 and Mineral Auction Rule – 2015, Ministry of Mines, GSI identified the block for exploration & MECL decided to take up the block for G-4 level of exploration under NMET funding. MECL requested Ministry of Mines, Government of India to reserve the block to carry regional exploration.
- 1.1.4 Ministry of Mines, Government of India allotted 30 Regional Mineral Exploration Blocks for G-4 exploration from the 100 Reports handed over by GSI to MoM. The Regional Exploration for Iron Mineralisation in Kanawat-Chala-Karath-Bagholi Area, (Block ID-WR-RAJ-07), in an area of 129 sq.km. District: Jhunjhunu & Sikar, (Rajasthan) is one of the block allotted to MECL. Accordingly MECL prepared proposal for regional exploration and being put up for approval of Technical Committee of NMET.

1.2.0 Location of the Block:

- 1.2.1 The block is Located 55 km SSE of Jhunjhunu district headquarter and 10 km West of Neem ka Thana town. The road from Neem Ka Thana to Kanawat passes through the southern half portion of the block via Chala, there are various motorable roads in the block and as such the block is easily traversable. The Rewari-Fulera rail line of western railway passes through Ghasipura Village at the south Eastern Corner point at the block boundary. The block is located in survey of India Toposheet No. 45 M/9 and 45 M/10. The Co-ordinates of the corner points of the block are given below and covers an area of nearly 129 sq km

- | | |
|----------------------------------|----------------------------------|
| A) 27° 36' 00"N and 75° 37' 00"E | B) 27° 36' 45"N and 75° 41' 00"E |
| C) 27° 48' 00"N and 75° 40' 00"E | D) 27° 48' 00"N and 75° 43' 30"E |

1.3.0 Physiology and Drainage:

- 1.3.1 The area of block is mostly covered by alluvium and windblown sand with some isolated hillocks, there is a ridge along the eastern part of Kantli River in the block running from Baniwala -Ki-Dhani upto 2 km SE of Bagholi in a total strike of about 9 km, having a NNE-SSW trend with some isolated hillock in its further continuity on both sides for around 2 km each. There is a mound at the south western corner of the block exhibiting a peak of 642 m from mean sea level, is the highest peak in the proposed study area. The general reduced level of the proposed study area is 451 m in the southern portion and 403 m from mean sea level in northern portion. The north western corner portion of the block area is also traversed by a ridge striking NE-SW having maximum reduced level point of 610 m from mean sea level.
- 1.3.2 The drainage pattern in the block shows dendritic pattern of very low density merging into the streams acting as tributaries to Kantli River. The Kantli River is flowing from southern side of the block to the northern side with meanders generally occupying the western boundary of the block and passes through the middle portion in the northern part of the block.

2.0.0 Previous work:

- 2.1.1 Ground evaluation of the airborne geophysical data flown under Operation Hard Rock for the investigation of ferrous and associated metallic minerals shows Iron ore bodies present in Bagholi-Papra & Karath area. Geological mapping on aerial photographs in part of toposheet No. 45 M/9 & 45 M/10 has been undertaken by Jhanwar M.L. and Mathur O.P. in field season 1964-65. In field season 1963-64 preliminary investigation of iron ore deposits near Bagholi & Papra in the block area. In relation to the iron ore deposits in Bagholi area Geophysical investigation has been carried out by Singh R.R and Vinod Kumar in the field season 2007-08 and advised for further investigation.
- 2.1.2 The known iron ore deposits at Bagholi and Karath are mining lease area, as given in the summary provided by GSI. The continuity of ore body and both sides can be explored.

3.0.0 Geology and Structure:

3.1.0 Regional Geology and Structure of the area.

- 3.1.1 The block area is situated south of the Kantli fault. The lithounits exposed in the region south of Kantli fault are of Mangalwar Complex of rocks belonging to Bhilwara Supergroup forming the basement of Archaean age. The lithounits of Ajabgarh, Alwar and Shyamgarh Groups of Delhi Supergroup intruded by quartz veins, pegmatites and granite of Lower to Middle Proterozoic age lie unconformably over Archaean age of rocks. The whole sequences are intruded again by quartz veins of Upper Proterozoic age. The lithounits shows NE-SW trend. The regional stratigraphic sequence of the lithounits of the area (after GSI, District Resource map) is given below.

The Regional Stratigraphic sequence of lithounits (after GSI)

Age	Super group	Group	Lithounits
Quaternary			Alluvium & Blown sand
Upper Proterozoic			(Intrusive) Quartz veins
Middle to Lower Proterozoic	Delhi		(Intrusive) Quartz veins & Pegmatites, Granite.
		Ajabgarh	Impure Marble, Amphibolite, Quartzite, Carbon Phyllite.
		Alwar	Massive Quartzites, Schists
		Shymgarh	Slate with of Greywacke bands
			Pelitic schist
			Quartzites / Conglomerate
			Felsic Volcanic
-----Unconformity-----			
Archaean	Bhilwara	Mangalwar Complex	Marble, Dolomite, Calc Silicate Rock

3.2.0 Geology and Structure of the block:

- 3.2.1 The lithounits exposed in the block are Mangalwar Complex Group of rocks of Bhilwara Supergroup intruded by Albitite, which is pink in colour, medium to coarse grained and composed mainly of albite. The iron ore bands trend N30°E-S30°W direction with steep dips of around 70° due southeast. Iron ore consists of Haematite and intermixed Magnetite. The iron ore body shows pinch & swell structure. Close to Papra village N-S trending calc-gneiss showing steep westerly dips is exposed. Three phases of deformation have been identified in the rocks of the area.
- 3.2.2 The iron ore occurs on the eastern flank of the hillock and is traceable for a strike length of nearly 2 km it follows the strike of rock formation trending N60°E – S60°W with shallow dips of 45° due SE the width of iron ore band varies from 2 to 4 m. The average Fe in the ore samples of different areas are 51.67% in Bagholi-Papra and 44.10% in Karath. The stratigraphic sequence of lithounits in the block area (after GSI) is given below.

The Stratigraphic Sequence of Lithounits of the block (after GSI)

Age	Super group	Group	Lithounits
Recent			Alluvium and Blown sand
Archaean	(Intrusive)		Albitite
	Bhilwara	Mangalwar Complex	Calc-silicate / Calc Gneiss, Iron ore bands

4.0.0 Objective of the proposed exploration programme:

4.1.1 The basic Geoscience data provided by GSI has been studied and evaluated. Based on the evaluation the present exploration programme has been formulated to fulfill the following objectives.

- i) To carry out geological mapping on 1:12,500 scale and demarcate the rock types of Iron bearing formation with the structural features to identify the surface manifestations and disposition of the ore body.
- ii) To collect surface samples and analyse them for iron and decide further course of exploration programme.
- iii) In case, surface samples give positive results than Geophysical survey is to be carried out for delineation of mineralized zone area under soil cover. Based on the results of surface samples and Geophysical survey studies then to drill 5 scout boreholes for intersection of the mineralized zones in an area of 129 sq km. This will decide the future course of exploration programme at G-3/G-2 category of UNFC.
- iv) To estimate reconnaissance Iron resources in the block area with accessory elements as per UNFC norms and Minerals (Evidence of Mineral Contents) Rule-2015 at G-4 level.

5.0.0 Proposed scheme of Exploration:

5.0.1 In accordance to the objective set for the block, the exploration programme has been formulated. The exploration shall be carried out as per Minerals (Evidence of Mineral Content) Rule-2015. Accordingly, the following scheme of exploration is formulated in order to achieve the objectives. The details of different activities to be carried out are presented in subsequent paragraphs.

5.1.0 Geological mapping:

5.1.1 Geological Mapping will be done on 1:12,500 scales to demarcate rock types with various structural features, mineralized zones etc, sample of rock types and mineralized zones

5.2.0 Geochemical Sampling

5.2.1 Surface Sampling (Bed Rock Sample / Soil Sample)

During the course of Geological mapping, the bed rock and stream sediment samples shall be collected from the out crops & stream sediments. The soil portion is mainly blown sand & Alluvium hence soil samples will not be helpful. A total of 100 samples from bed rock and 100 Nos Soil samples shall be collected, prepared and analysed for five radicals i.e. Fe, SiO₂%, Al₂O₃%, P% and LOI percentage. A total of 10 Nos of Check samples will be prepared and analysed for Fe, SiO₂%, Al₂O₃%, P% and LOI.

5.2.2 Stream sediment samples:

The stream sediments samples shall be collected from the entire study area of 129 sq km. the samples shall be collected (100 Nos) from the study area.

5.3.0. Surveying:

5.3.1. The block boundary will be surveyed by DGPS and total station in WGS-84 datum for demarcation of block boundary points. Survey party will be associated with Stream Sediment sample and Bed rock sample collection by taking up the points and plotting its location on map for proper interpretation of the sample data. Survey party will also be associated with geological mapping and Geophysical survey team. The mineralized zones if any, present will be observed during geological mapping will be plotted with litho contacts on map for the finalization of geological map on 1:12,500 scale. During drilling, scout borehole fixation and determination of reduced level and Co-ordinates of the boreholes only will be undertaken, if mineralized zones are identified, contouring of the surrounding areas of mineralised zones (ore bodies) would be done on 2 m contour internals along with survey of surface features.

5.4.0 Geophysical Survey:

5.4.1 The area of the block is nearly 129 sq km and to assess the strike continuity of the sub-surface mineralised zones (ore body) need of Geophysical Survey is felt. Based on the results of Geological Mapping and Geochemical sampling (Bed rock sampling, Soil Sampling & Stream sediment sampling) if required Surface Geophysical survey will be carried out. The Iron ore bodies can be detected by Magnetic and Gravity survey. The bodies are occupying the position in the series of isolated hillocks, most of the ore body continuity is soil covered. Hence, the geophysical survey programme has been clubbed during the exploration programme. The geophysical survey shall be carried out by using magnetic and gravity survey at 50 m station interval in the dip and strike direction in split profiles of 1 to 2 km covering the potential area of 18.00 sq km in total area of 129 sq km block area leaving the lease areas.

5.5.0 Exploratory Mining

5.5.1 Shallow Trenching / Pitting (Excavation)

Trenching and pitting shall be carried out in the potential zones identified based on the results of Geological Mapping & Geochemical sampling. A provision of shallow trenching of 100 cu. m. is kept. Pitting shall be done for correlation of mineralised zones on surface upto a depth of 1m after removal of soil/ weathered column in the area. Locations of the pits & trenches on ground will be decided by field geologist based on field observations. A provision of 100 number of primary trench / pit samples is kept for analysis of (Fe, SiO₂, Al₂O₃, P & LOI) and 20 samples for Au & Ag by Fire assay) 20 samples for Cu & Mo.

The trench & pit walls will be mapped on 1:200 scale.

Thus a total of 100 cu m of shallow trenching & pitting work along with associated geological & laboratory studies has to be carried out.

5.6.0 Core Drilling:

5.6.1 In 129 sq km proposed study area /block area these are two known parallel bodies at 2 km apart in strike. A total of 5 scout boreholes shall be drilled with a total of 600 m

drilling to assess the attitude of the sub surface disposition of the Iron bodies for the upper level of intersection. For the lower level of intersection drilling programme shall be formulated after getting the positive intersections at this stage.

5.7.0 Drill Core Logging:

5.7.1 The drill core will be logged for rock types, structural features, textures, intersection of ore zones, type of mineralization and occurrence of various ore minerals. The logging for determining the rock quality determination will also be undertaken.

5.8.0 Drill Core Sampling:

5.8.1. During the geological logging of drill core samples will be marked on concentration wise in the mineralized zone. 125 Nos of samples (primary + check) will be analysed for five radicals i.e. Fe%, SiO₂%, Al₂O₃%, P% and LOI percentage, 20 samples each will be subjected for analysis of Cu & Mo and Au by Fire assay. 15 nos of composite samples will be analysed for five radicals i.e. Fe, SiO₂%, Al₂O₃%, P% & LOI and for analysis of Cu & Mo and Au by Fire assay.

5.9.0 Whole rock analysis:

5.9.1 10 number of rock samples shall be subjected to whole rock analysis for SiO₂, Al₂O₃, Fe₂O₃, TiO₂, MnO, CaO, Na₂O, K₂O+H₂O, MgO, P₂O₅, CO₂, & S to check the rock types & their variation in chemical composition.

5.10.0 XRD Studies

5.10.1 From the composite samples, 10 samples shall be subjected for XRD studies.

5.11.0 Spectroscopic (Trace Element Study by LA MC-ICPMS Method) studies:

5.11.1. 15 N0.samples for the study of trace elements (48 Radicals) by La MC- ICP-MS Method spectroscopic studies.

5.12.0 Petrological Studies:

5.12.1 During the course of Geological mapping 10 nos surface samples and 15 nos samples from various lithounits of core logging will be studied for petrography. 20 samples from mineralized zones will be studied for the ore mineral assemblages' distribution, alteration, enrichment etc. will be studied.

5.13.0 Specific gravity Determination:

5.13.1 Specific gravity shall be determined on 20 samples from the mineralized zones intersected in the boreholes.

5.14.1 Quantum of Work Proposed:

The Details of proposed quantum of work in the proposed area is given below:-

Table: 5.1 Proposed Quantum of Work for Iron in Kanawat-Chala-Karath-Bagholi Area, (Block ID-WR-RAJ-07), in an area of 129 sq.km. District: Jhunjhunu & Sikar, (Rajasthan)

Sl. No.	Item of work	Unit (m)	Proposed Quantum of Work
1	Geological Mapping (on 1:12500 Scale)	Sq. Km	129 sq km
	Topographical Survey (on 1:12500 Scale)	Sq. Km	129 sq km
	Bore Hole Fixation (Scout Boreholes)	Nos	5 Nos
	RL & Coordinate Determination	Nos	5 Nos
2	Geochemical Sampling		
	a) Bed Rock Sampling	Nos.	50Nos
	b) Soil Sampling	Nos.	25 Nos
	C) Stream Sediment Sampling	Nos	25 Nos
3	Ground Geophysical Survey*		
	a) Gravity Survey*	No of Stan.	9738 N0s
	b) Magnetic Survey*	No of Stan.	9738 N0s
4	Exploratory Mining		
	Trenching & Pitting	Cu m	100 Cu m
5	Drilling (coring)	m	600m (5 Bhs)
6	Geological work		
	a) Geological Core Logging	m	600m (5 Bhs.)
7	Laboratory Studies		
	Surface Sampling (Primary samples)		
	i) Bed Rock samples (Fe, SiO₂, Al₂O₃, P & LOI)	Nos	100 Nos
	b) for Au & Ag by Fire Assay	Nos	20 Nos
	c) For Cu & Mo	Nos	20 Nos
	ii) Soil Samples (Fe, SiO₂, Al₂O₃, P & LOI)	Nos	100 Nos
	b) for Au & Ag by Fire Assay	Nos	20 Nos
	c) For Cu & Mo	Nos	20 Nos
	iii)) Stream Sediment Samples (Fe, SiO₂, Al₂O₃, P & LOI)	Nos.	100Nos.
	b) for Au & Ag by Fire Assay	Nos	20 Nos
	c) For Cu & Mo	Nos	20 Nos
	iv) Check Samples (Bed Rock / Soil/ Stream sediment)		
	a) (Fe, SiO ₂ , Al ₂ O ₃ , P & LOI)	Nos	10 N0
	b) For Au by Fire Assay	Nos	10 Nos
	v) Trench & Pitting (Primary & Check samples)		
	a) for five radicals (Fe, SiO ₂ , Al ₂ O ₃ , P & LOI)	Nos	100 Nos
	b) for Au & Ag by Fire Assay	Nos	20 Nos
	c) For Cu & Mo	Nos	20 Nos
	vi) Drill Core Primary Samples	Nos	125 Nos
	a) for 5 radicals (Fe, SiO ₂ , Al ₂ O ₃ , P & LOI)		
	b) for Au by Fire Assay	Nos	15 Nos
	c) For Cu & Mo	Nos	15 Nos
	vii) Composite Samples for 5 radicals		
	a) (Fe, SiO ₂ , Al ₂ O ₃ , P & LOI)	N0s	15 N0s

	b) for Au & Ag by Fire Assay	Nos	15 Nos
	c) For Cu & Mo	Nos	15 Nos
8	Physical Studies a) XRD – Studies on Composite samples	Nos.	10 Nos
	b) ICPMS Method Studies for full spectrum of 48 elements	Nos.	15 Nos
9	Petrological Samples (Surface & Bh Core Samples) a) Preparation of Thin Section	N0s	25 Nos
	b) Study of Thin Section	N0s	25Nos
10	Mineragraphic Studies (Surface & Bh Core Samples) a) Preparation of Polished Section	N0s	20 Nos
	b) Study of Polished Section	N0s	20 Nos
11	Whole Rock Analysis for SiO ₂ , Al ₂ O ₃ , Fe ₂ O ₃ , TiO ₂ , MnO, CaO, Na ₂ O, K ₂ O+H ₂ O, MgO, P ₂ O ₅ , CO ₂ , & S	Nos	10 Nos
12	Specific gravity Determination	Nos.	20 Nos
13	Report Preparation [As per Mineral (Evidence of Mineral Contents) Rule-2015]	N0s	1
*Note	The Geophysical Survey (Gravity & Magnetic) can be increased based on the results of present work		

6.0.0 Time schedule and cost Estimate:

6.1.0 Time schedule

6.1.1 For the Proposed exploration programme in the 129 sq. km block area the work wise details are indicated in bar chart given below.

Time schedule (in months) for Exploration Programme in Kanawat-Chala-Karath-Bagholi area, (Block ID-WR-RAJ-07), in an area of 129 sq.km. District: Jhunjhunu & Sikar, (Rajasthan)													
Item of work	1	2	3	4	5	6	7	8	9	10	11	12	
Geological mapping (one party)	←→												
Bed Rock sampling	←→												
Stream sediment sampling	←→												
Surveying (1 party) for sampling etc	←→												
Sample preparation bed rock/ stream (1 party)		←→											
Analysis work			←→										
Surface Geophysical Survey			←→										
Geophysical Report						←→							
Surveying geophysical survey (1 party)			←→										
Trenching / Pitting					←→								
Trench & Pit sampling						←→							
Drilling (600m) (1 drill)							←→						
Surveying (1 party) for drilling							←→						
Sample Preparation(drill core) (1 party)								←→					
Geological Party days for drilling & sampling work & Report work (1 party)								←→					

Analytical work drill core samples										←	→	
Geological Report										←	→	

6.2.0 Cost Estimate:

6.2.1 The Project cost with provisional escalation is estimated at say **Rs.255.71 Lakhs**. The details of item wise cost estimate with inbuilt actual escalation as on 31.3.2016 is given below.

Sl. No.	Item	Total Estimated Cost (Rs.)
1	Geological, Survey & Sampling Work	39,86,190/-
2	Geophysical Survey & Report	96,57,432/-
3	Exploratory Mining (Pitting & Trenching)	357290/-
4	Drilling	94,74,666/-
5	Laboratory Studies	18,42,455/-
	Subtotal	2,53,18,033/-
6	Report	2,53,180/-
	Total	2,55,71,213/-

Or Say Rs.255.71 Lakhs (Rs. 2.56Crore)

7.0.0 Justification:

- In view of MMDR Amendment & Mineral Auction Rule-2015, GSI has identified this block for exploration MECL decided to take up the work under NMET funding. Ministry of Mines Identified / allotted 30 blocks for Regional Exploration. The present block is one of the block. Accordingly MECL formulated the proposal.
- In the proposed study area, there are two known Iron ore bodies, these are isolated hillocks with Iron ore exposures available as guide and their continuity below soil will be delineated by Geophysical survey for localisation of ore body.
- The exploration will be helpful in estimation of reconnaissance resources of Iron ore in the proposed study area.
- In case the Regional Exploration results are positive it will help in planning of detailed exploration programme which in turn will facilitate the State Govt. for auctioning of Block.

Cost Estimate for G-4 Level of Exploration for Iron in Kanawat-Chala-Karath-Bagholi Area, (Block ID-WR-RAJ-07), District: Jhunjhunu & Sikar, (Rajasthan)					
Sl. No.	Item of Work	Unit	Rates (2016-17)	Qty.	Amount
A	REMOTE SENSING & REPORT (1 BLOCK)	Nos	2,000,000.00	1	2000000.00
B	GEOLOGICAL WORK				
1	Survey Party days				
	a) Survey Party days (1party) For Sampling etc	days	6,146.00	60	368760.00
	b) Survey Party days (2 party) For Geophysical Survey etc	days	6,146.00	90	553140.00
	b) Survey Party days (2 party) For Drilling	days	6,146.00	60	368760.00
2	Geologist Party days				
	a) Geological Party days (2 Party) For Geological Mapping etc	days	8,021.00	60	481260.00
	b) Geological Party days (1 Party) For Drilling, Core Sampling	days	8,021.00	120	962520.00
3	Sampling Party days	day			
	a) Sample Preparation for Bed Rock, Soil , Stream samples (2 Partys)	days	2,945.00	60	176700.00
	b) Sample Preparation Drill Cores (1 Party)	days	2,945.00	90	265050.00
4	Transportation (Light Vehicles, 2 nos)	day	1,500.00	540	810000.00
	Sub-Total B				3986190.00
C	GEOPHYSICAL SURVEY & REPORT				
	Magnetic Stations	Nos.	482.00	9738	4693716.00
	Gravity stations	Nos.	482.00	9738	4693716.00
	Transportation (Light Vehicles, 2 nos)	day	1,500.00	180	270000.00
	Sub-Total C				9657432.00
D	CORE DRILLING (5 BH)				
1	Surface Drilling (2 rigs)	m	11,601.00	600	6960600.00
2	Transportations (2 Rigs)	Km	34.00	4000	136000.00
3	Accommodation (One time/ Drill)	Nos	728,250.00	2	1456500.00
4	Camp Setting / Winding	Nos	268,723.00	2	537446.00
5	Road Making (Flat Terrain)	Km	20,368.00	15	458280.00
6	GI Core Boxes	Nos	2,000.00	150	300000.00
7	Transportation Charges of Core Boxes	Km	34.00	300	10200.00
	Sub Total D				9859026.00
E	LABORATORY STUDIES				
1	Chemical Analysis				
	i) Surface sampling (Bed Rock Samples)				
	a) Fe, SiO ₂ , Al ₂ O ₃ , P, Lol	Nos.	2,227.00	25	55675.00
	ii) Stream Sediment Samples				
	a) Fe, SiO ₂ , Al ₂ O ₃ , P, Lol	Nos.	2,227.00	25	55675.00
	d) Check Samples (Bed rock/ soil/ stream) (Fe, SiO ₂ , Al ₂ O ₃ , P, Lol)	Nos	2,227.00	5	11135.00
	iii) BH Core Sampling, Primary & Check samples				
	a) Fe, SiO ₂ , Al ₂ O ₃ , P, Lol	Nos.	2,227.00	125	278375.00
	iv) Composite Samples for 5 radicals				
	a) Fe, SiO ₂ , Al ₂ O ₃ , P, Lol	Nos.	2,227.00	15	33405.00
2	Physical Analysis				
	i) Petrographic Studies (BH core + Surface Samples)				
	a) Preparation of thin section	Nos	545.00	25	13625.00
	b) Study of thin section	Nos	1,495.00	25	37375.00
	ii) Mineragraphic Studies (BH core + Surface Samples)				
	a) Preparation of polished section	Nos	583.00	20	11660.00
	b) Study of polished section	Nos	2,118.00	20	42360.00
	iii) Whole rock analysis	Nos	6,386.00	10	63860.00
	iv) Specific Gravity Determination (BH)	Nos	198.00	20	3960.00
	v) XRD & Spectroscopic Studies				
	a) X-RD Studies on composite	Nos	5,900.00	10	59000.00
	b) Spectroscopic studies (12 elements- Cd,Sn,W,Sb,Mo,Ce,Nb,Ba,La,Bi,Co & Ni)	Nos	6,274.00	10	62740.00
	Sub-Total E				728845.00
	Total (A+B+C+D+E)				26231493.00
F	EXPLORATION REPORT - 1% of (A+B+C+D+E)				262315.00
	GRAND TOTAL (A+B+C+D+E+F)				26493808.00
					Say Rs. 264.94 lakhs
Note	Rates of Goel Committee based on actual escalation as per RBI indices as on 31.3.16 and provisional escalation of @15% points for drilling and 25% points for Geological & Laboratory Studies for subsequent year.				

Cost Estimate for G-4 Level of Exploration for Iron in Kanawat-Chala-Karath-Bagholi Area, (Block ID-WR-RAJ-07) in an area of 129 Sq. Km, District: Jhunjhunu & Sikar, (Rajasthan)						
Sl. No.	Item of Work	Unit	Base Rate	Rates	Qty.	Amount
			01-04-1990	(2016-17)		
A	GEOLOGICAL WORK					
1	Survey Party days					
	a) Survey Party days (1party) For Sampling etc	days	1180	6,146	60	368760
	b) Survey Party days (2 party) For Geophysical Survey etc	days	1180	6,146	90	553140
	b) Survey Party days (2 party) For Drilling	days	1180	6,146	60	368760
2	Geologist Party days					
	a) Geological Party days (2 Party) For Geological Mapping on 1:12500 Scale in an area of 129 Sq. Km	days	1541	8,021	60	481260
	b) Geological Party days (1 Party) For Drilling, Core Sampling	days	1541	8,021	120	962520
3	Sampling Party days	day				
	a) Sample Preparation for Bed Rock, Soil, Stream samples (2 Partys)	days	525	2,945	60	176700
	b) Sample Preparation Drill Cores (1 Party)	days	525	2,945	90	265050
4	Transportation (Light Vehicles, 2 nos)	day	Lumpsum	1,500	540	810000
	Sub-Total A					3986190
B	GEOPHYSICAL SURVEY & REPORT					
1	Magnetic Stations	Nos.	107	482	9738	4693716
2	Gravity stations	Nos.	107	482	9738	4693716
3	Transportation (Light Vehicles, 2 nos)	day	Lumpsum	1,500	180	270000
	Sub-Total B					9657432
C	Exploratory Mining					
1	Excavation (Pitting & Trenching)	Cu m	345	1853	100	185300
2	Trench / Pit Sampling Party days (1 party)	Days	994	5733	30	171990
	Sub-Total C					357290
D	CORE DRILLING (5 BH)					
1	Surface Drilling (2 rigs)	m	2551	11,215	600	6729000
2	Transportations (2 Rigs)	Km	8.8	34	4000	136000
3	Accommodation (One time/ Drill)	Nos	185925	7,28,250	2	1456500
4	Camp Setting / Winding	Nos	68606	2,68,723	2	537446
5	Road Making (Flat Terrain)	Km	5200	20,368	15	305520
6	GI Core Boxes	Nos	Lumpsum	2,000	150	300000
7	Transportation Charges of Core Boxes	Km	8.8	34	300	10200
	Sub Total D					9474666
E	LABORATORY STUDIES					
1	Chemical Analysis					
	i) Surface sampling (Bed Rock Samples)					
	a) For 5 radicals Fe, SiO ₂ , Al ₂ O ₃ , P, Lol	Nos.	110 + (76*4)=414	2,227	100	222700
	b) for Au by Fire Assay	Nos.	205	1,127	20	22540
	c) For Cu & Mo.	Nos.	110 + 76 = 186	1,021	20	20420
	ii) Soil sampling					
	a) For 5 radicals Fe, SiO ₂ , Al ₂ O ₃ , P, Lol	Nos.	110 + (76*4)=414	2,227	100	222700
	b) for Au by Fire Assay	Nos.	205	1,127	20	22540
	c) For Cu & Mo.	Nos.	110 + 76 = 186	1,021	20	20420
	iii) Stream Sediment Samples					
	a) For 5 radicals Fe, SiO ₂ , Al ₂ O ₃ , P, Lol	Nos.	110 + (76*4)=414	2,227	100	222700
	b) for Au by Fire Assay	Nos.	205	1,127	20	22540
	c) For Cu & Mo.	Nos.	110 + 76 = 186	1,021	20	20420
	iv) Check Samples (Bed rock/ soil/ stream)					
	a) For 5 radicals (Fe, SiO ₂ , Al ₂ O ₃ , P, Lol)	Nos	110 + (76*4)=414	2,227	10	22270
	b) for Au by Fire Assay	Nos	205	1,127	10	11270
	v) Trench & Pit Sampling					
	a) For 5 radicals Fe, SiO ₂ , Al ₂ O ₃ , P, Lol	Nos.	110 + (76*4)=414	2,227	100	222700
	b) for Au & Ag by Fire assay	Nos	268	1,460	20	29200
	c) For Cu & Mo	Nos	110 + 76 = 186	1,021	20	20420
	vi) BH Core Sampling, Primary & Check samples					
	a) For 5 radicals Fe, SiO ₂ , Al ₂ O ₃ , P, Lol	Nos.	110 + (76*4)=414	2,227	125	278375
	b) for Au by Fire Assay	Nos.	205	1,127	20	22540
	c) For Cu & Mo.	Nos.	110 + 76 = 186	1,021	20	20420
	vii) Composite Samples for 5 radicals					
	a) For 5 radicals Fe, SiO ₂ , Al ₂ O ₃ , P, Lol	Nos.	110 + (76*4)=414	2,227	15	33405
	b) for Au & Ag by Fire assay	Nos	268	1,460	15	21900
	c) For Cu & Mo.	Nos.	110 + 76 = 186	1,021	20	20420
2	Physical Analysis					

	i) Petrographic Studies (BH core + Surface Samples)					
	a) Preparation of thin section	Nos	100	545	25	13625
	b) Study of thin section	Nos	228	1,495	25	37375
	ii) Mineragraphic Studies (BH core + Surface Samples)					
	a) Preparation of polished section	Nos	100	583	20	11660
	b) Study of polished section	Nos	364	2,118	20	42360
	iii) Whole rock analysis (SiO ₂ , Al ₂ O ₃ , Fe ₂ O ₃ , TiO ₂ , MnO, CaO, Na ₂ O, K ₂ O+H ₂ O, MgO, P ₂ O ₅ , CO ₂ , & S)	Nos	1316	6,386	10	63860
	iv) Specific Gravity Determination (BH)	Nos	32	198	20	3960
	v) XRD & Spectroscopic Studies					
	a) X-RD Studies on composite	Nos	1137	5,900	10	59000
	b) Spectroscopic(12 elements-Cd,Sn,W,Sb,Mo,Ce,Nb,Ba,La,Bi,Co & Ni)/ LA MC-ICMS Method studies for full spectrum of 48 Elements (GSI rate has been considered)	Nos	6100	7,381	15	110715
	Sub-Total E					1842455
	Total (A+B+C+D+E)					25318033
F	EXPLORATION REPORT - 1% of (A+B+C+D+E)					253180
	GRAND TOTAL (A+B+C+D+E+F)					25571213
					Say Rs. 255.71 lakhs	
Note	Revised rate of promotional work by MECL on behalf of Govt. of India vide letter no. 37(I)/2006-MI dated 02.07.2014 and based on actual escalation as per RBI indices as on 31.3.16 and provisional escalation of @15% points for drilling and 25% points for Geological & Laboratory Studies for subsequent year.					