

**PROPOSAL OF RECONNAISSANCE SURVEY (G-4 STAGE) FOR
IRON, MANGANESE AND ASSOCIATED MINERALS IN SALAIYA
BLOCK (110.56 SQ. KM)
DISTRICTS- JABALPUR, KATNI & UMARIA, MADHYAPRADESH**

COMMODITY: IRON, MANGANESE AND ASSOCIATED MINERALS

**BY
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SEMINARY HILLS**

PLACE: NAGPUR

DATE: 16.02.2023

Summary of the Block for Reconnaissance Survey (G4 Stage)
GENERAL INFORMATION ABOUT THE BLOCK

Features	Details
Block ID	SALAIYA G4 BLOCK
Exploration Agency	Mineral Exploration and Consultancy Limited (MECL)
Commodity	Iron, Manganese and Associated Minerals
Mineral Belt	The area belongs to the Mahakoshal Group. Mineralisation of Iron is occurring around the area associated with Banded Iron Formation (BIF) while Manganese is associated with BIF and Phyllites.
Completion period with entire Time schedule to complete the project	Time Line for Exploration work with Drilling is 14 months.
Objectives	The block area falls in the vicinity of old quarries, pits and several lease hold area for Iron and Manganese. The presence of supporting lithology for Iron and Manganese mineralization viz. BIF and Phyllites. encourages to take up the G4 Exploration in the area. Evaluation of previous work, work done by pvt mines and exploration agencies and field investigation done by MECL has indicated occurrence of Iron and Manganese in and around the proposed block. On the basis of these evidences of mineralisation, the present exploration program has been formulated to fulfill the following objectives. i) To carry out Geological & structural mapping on 1:12,500 scale for demarcation of Iron and Manganese bearing host rock for these mineralisation with the structural features to identify the surface manifestations and lateral disposition of the mineralized zones. ii) To collect Surface Bedrock samples, Channel samples and Trench samples & analyze for Iron & Manganese for further course of Exploration program. iii) Shallow pitting / trenching will be done to expose the concealed host rock and

		mineralisation. iv) If phase-I exploration data will give positive results, 8 Nos. of scout boreholes shall be drilled which in turn will decide the future course of Exploration program at G-3 category of UNFC. v) To estimate reconnaissance resources (334) along with accessory elements as per UNFC norms and Minerals (Evidence of Mineral Content) Rules-2015 at G-4 level.
	Whether the work will be carried out by the proposed agency or through outsourcing and details thereof. Components to be outsourced and name of the outsource agency	Work will be carried out by the proposed agency (MECL).
	Number of Geoscientists	Nos. of Geoscientists: 2 (1Field + 1HQ)
	Expected Field days(Geology, Surveyor)	Geologist Party days:180 field + 60 HQ
		Survey Party days : Nil

1.	Location	
	Longitude-Latitude	Refer Block Description
	Villages	Amoch, Majauli, Mahgawan, Chhapra, Salaiya, Imaliya etc.
	Tehsil/Taluk	Majholi, Sihora, Kundam (Jabalpur Distt.) Badwara, Dhimarkheda, Murwara, Bahoriband (Katni Distt.) Chandia (Umaria Distt.)
	District	Jabalpur, Katni, Umaria
	State	Madhya Pradesh
2.	Area (hectares/ square kilometres)	
	Block Area	110.56 sq.km
	Forest Area	Part of Amoch and Chiulapani Reserve Forest falls in the Block area
	Government Land Area	Data not available
	Charagaha	Data not available
	Private Land Area	Part of the area is private cultivated land
	Study of DSS	Area Not Inviolate
3.	Accessibility	
	Nearest Rail Head	Sleemanabad Road Station of West Central Railway Main line falls within the NE part of the Proposed block.

	Road	The proposed block is well connected via NH-30 connecting Siroha to Sleemanabad
	Airport	Jabalpur in SW Direction (50 km)
4.	Hydrography	
	Local Surface Drainage Pattern (Channels)	The drainage pattern in the block is dendritic. General flow direction of the area is towards south west and South east in the southern part of the proposed block while in the northern part general flow is towards East to NE. Silpuri Nadi, a tributary of River Narmada flows from the central part of the block towards south.
	Rivers/ Streams	River Narmada in South
5.	Climate	
	Mean Annual Rainfall	Average annual rainfall is 890 mm The climate of the area is mainly tropical with clearly defined dry and rainy seasons. The humidity is generally low except during the monsoons.
	Temperatures (December) (Minimum) Temperatures (May-June) (Maximum)	Minimum temperatures 10° C Maximum temperatures up to 45° C
6.	Topography	
	Toposheet Number	64 A/02 and 64 A/06
	Morphology of the Area	The topography in the proposed block is moderate to flat with occasional undulation indicating an overall slope towards south.
7.	Availability of baseline geoscience data	
	Geological Map (1:50K/25K)	Bhukosh (1:50,000)
	Geochemical Map	-
	Geophysical Map (Aeromagnetic, ground geophysical, Regional as well as local scale GP maps)	
8.	Justification for taking up Reconnaissance Survey/ Regional Exploration	i) The area belongs to the Mahakoshal Group which is well known for various mineral resources including Iron and Manganese. ii) Mineralisation of Iron is occurring around the area associated with Banded Iron Formation (BIF) while Manganese is associated with BIF and Phyllites. iii) Several active Mines of Iron and Manganese are there in the close vicinity of the block including an exploration block of NMDC in south of the proposed block for Fe-Mn.

		iv) MECL has conducted field visit in the proposed block. During geological traverses, MECL has identified BIF and Phyllites at several places, collected 4 nos. of samples and analysed them through handheld XRF and in MECL Chemical Lab. Samples are showing upto 53 % Fe and Mn upto 13.7%. iv) Based on the mineralization evidences of Iron and Manganese in and around the block, the present Reconnaissance Survey exploration program at G-4 level has been prepared. Geological mapping, surface sampling and pitting/trenching will be helpful in assessing the disposition of the mineralized zones, structural features etc. v) The Exploration will be helpful in estimation of reconnaissance resources of Iron and Manganese and associated minerals in the block area. Geochemical sampling of BRS/CS/ Pitting/trenching and the drilling of scout boreholes will be helpful in assessing the disposition. vi) The Reconnaissance Survey (G4) will eventually help in planning of detailed exploration program (incase upgraded to G-3 level) which in turn will facilitate the state Government for action of block.
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PROPOSAL OF RECONNAISSANCE SURVEY (G-4 STAGE) FOR IRON, MANGANESE AND ASSOCIATED MINERALS IN SALAIYA BLOCK (110.56 SQ.KM), DISTRICTS- JABALPUR, KATNI & UMARIA, MADHYAPRADESH

1.0.0 INTRODUCTION

1.1.0 Preamble

- 1.1.1 Iron and Manganese being important constituent in steel manufacture has played a vital role in the industrial growth of a nation. Both Iron and Manganese are one of the most common elements in the Earth's crust and is widely distributed across the planet's surface. Iron, the metal of common man has its use in every sphere of life, since the Iron Age 800 BC and there on it forms the backbone of the industrial growth of a nation. The stage of growth in iron and steel industry of a nation is a measure of its economic status among the world communities. Manganese is very hard, brittle, gray-white transition metal that is found in variety of minerals, but never as free element in nature; is it often found in minerals in combination with iron.
- 1.1.2 It is well known fact that India is endowed with rich deposits of iron ore both quality wise and quantity wise. Indian iron ores are good demand in the international market especially in Asian markets. India could further explore markets in the Middle East and Europe as it is well placed geographically to these regions in comparison to other leading iron ore exporting countries in the world.
- 1.1.3 To cope with the increased demands, mining activities have to be accelerated. Mechanisation of iron ore mines is imperative not only to increase production but also to reduce production cost. The leading iron producing countries like Brazil, South Africa and Australia have increased their iron ore production by adopting cost-effective and technologically advanced schemes of mining.
- 1.1.4 Beneficiation of low grade iron ore and fines that are in plenitude in India could be another viable prospect. This will fetch good export value to the indigenous iron ore and create job opportunities in the sector. The Regional Research Laboratory(RRL), Bhubaneshwar, Ore Dressing Division of IBM and National Metallurgical Laboratory (NML), Jamshedpur, have developed techniques of iron ore beneficiation of iron ore beneficiation on pilot scale.
- 1.1.5 Although India is endowed with substantial resources of iron ore, many prospective areas in the country have still not been explored. Detailed exploration may result in further

- augmentation of iron ore resources. With increased use of iron ore with around 50% Fe in globe steel plants there is a need to reassess the iron ore resources of the country. Banded Iron Formation, namely, Banded Haematite-Quartzite (BHQ)/Jasper and Banded Magnetite Quartzite (BMQ) are other potential sources of iron ore and need exploration for assessment of technology to beneficiate BHQ/BMQ to extract iron ore from these sources.
- 1.1.6 On the other hand, The increasing demand of manganese in the country in recent years can be eased with the exploration of new manganese deposits of economic importance.
- 1.1.7 The Govt. of India enacted the MMDR Amendment Act, 2015 duly introducing the system of auction for allocation of Mineral Concessions. Manganese has been categorized in the Fourth Schedule which needs prospecting and exploration by the State Govt. before auctioning of blocks.
- 1.1.8 MECL in association with DMG, Madhya Pradesh has looked up for the freehold area for investigation of Iron and Manganese and associated minerals around the explored Iron and Manganese blocks in Balaghat district of Madhya Pradesh.
- 1.1.9 Subsequently, after receipt of consent from DMG, Madhya Pradesh to take up exploration work, MECL has prepared an exploration proposal for reconnaissance survey (G-4) for iron and manganese and associated minerals in Salaiya Block in Jabalpur, Katni and Umaria District of Madhya Pradesh and submitted to NMET for taking up for discussion in the upcoming TCC.
- 1.2.0 Location and Accessibility**
- 1.2.1 The block is located in the Jabalpur, Katni and Umaria Districts of Madhya Pradesh. The proposed block is well connected via NH-30 connecting Siroha to Sleemanabad. Sleemanabad Road Station of West Central Railway Main line falls within the NE part of the Proposed block.. The nearest airport Jabalpur, is 50 Km away from the block in SW direction. The area falls in Survey of India Toposheet No. 64A/02 and 64 A/06.
- 1.3.0 Physiography & Drainage**
- 1.3.1 The topography in the proposed block is moderate to flat with occasional undulation indicating an overall slope towards south.

1.3.2 The drainage pattern in the block is dendritic. General flow direction of the area is towards south west and South east in the southern part of the proposed block while in the northern part general flow is towards East to NE. Silpuri Nadi, a tributary of River Narmada flows from the central part of the block towards south.

1.4.0 Climate

1.4.1 The Average annual rainfall is 890 mm The climate of the area is mainly tropical with clearly defined dry and rainy seasons. The humidity is generally low except during the monsoons. The area comes within the semi arid zone with temperature ranging from 10°C (Dec-Feb) to 45°C (Apr-Jun).

1.5.0 Flora Fauna The Block falls in the part of Amoch and Chiulapani Reserve Forest. Main flora of the area are Mangoes, Neem (Margosa), Tendu, Mahua, Palas, Pipal, Barakar and Sagaun and main fauna are boars, Cheetal, Sambar, Rabbits, Snakes and Foxes. Large size scorpions are commonly found here which are almost jet black to brownish black in colour.

1.6.0 Regional Geology

1.6.1 The Proposed block fall in the Mahakoshal Group which is famous for various mineral assemblages. Mahakoshal Group of rocks are represented by the volcano-sedimentary sequence occurring as ENE-WSW trending linear belt extending from Narsinghpur district in M.P. to Palamau district in Jharkhand. The sediments include quartzite, conglomerate, phyllite, chert, stromatolitic dolomite, limestone and Banded Iron Formation inter-layered with metabasics of basaltic composition. The narrow belt of high grade gneisses which occur to the north and south of this belt in the area have been considered to be the basement for Mahakoshal Group. The Mahakoshal Supracrustals are intruded by serpentinitised ultramafic bodies of dunite-peridotitepyroxenite composition. Syn to post kinematic granitoids have intruded this sequence which are 1800Ma and 2400Ma old (Rb-Sr age dating, Bandyopadhyay et al, 1990). The Supracrustal rocks have been subjected to three phases of deformations, the first two phases are more pronounced (Roy & Bandyopadhyay, 1990). Green schist facies of metamorphism is seen in the entire belt, however, locally higher grade minerals also occur.

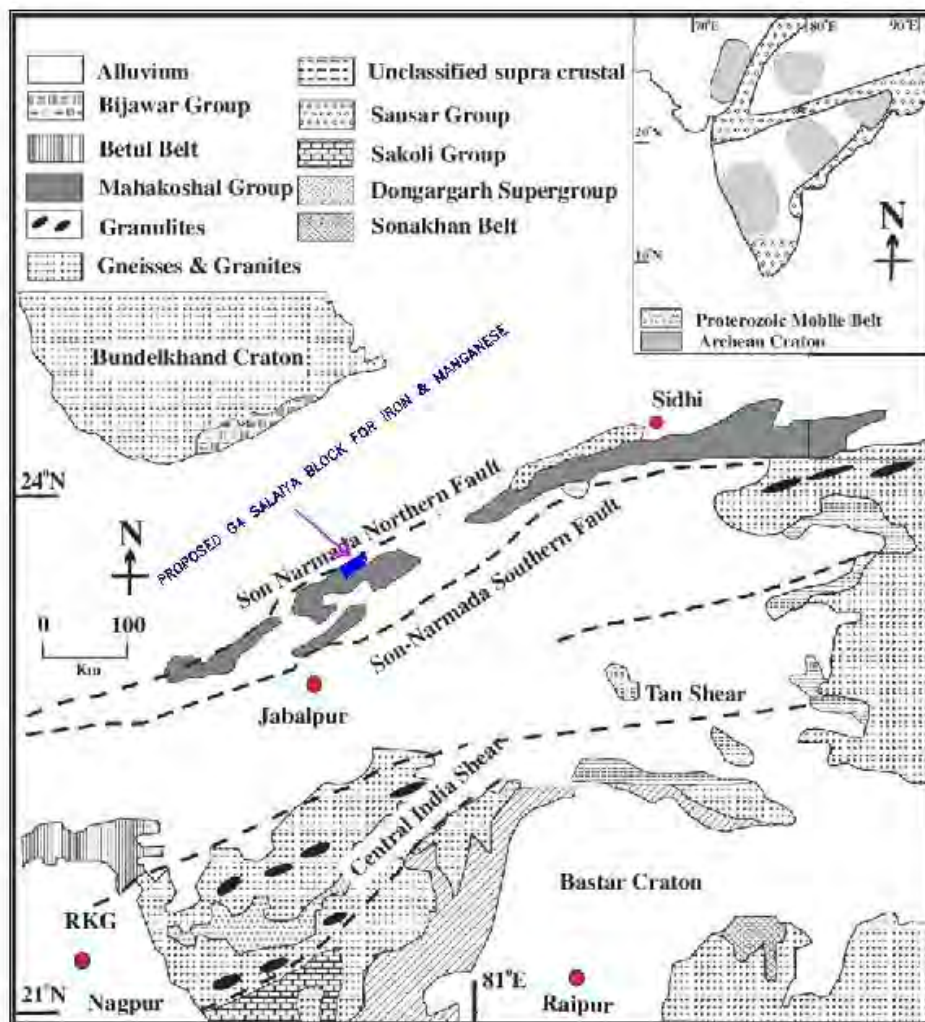


Fig- Map showing Proterozoic Mobile belt, Mahakoshal Group and the proposed G4 block

- 1.6.2 Nair et al. (1995) have advocated a threefold classification of Mahakoshal Group. The lower part comprises ultramafic flows and plugs constituting Chitrangi Formation, while the middle part named as Agori Formation, comprises chemogenic sediments viz. meta carbonates, chert and BIF with thin mafic flows. The upper part named as Parsoi Formation comprises thick sequence of argillites and greywacke.
- 1.6.3 Regional stratigraphic succession of the litho-units after GSI is illustrated in the Table I.A. Regional geological map with the proposed Block is given in PLATE-II.

Table I.A
Regional Stratigraphic sequence of Litho units (After GSI)

Age	Supergroup	Formation/Beds	Lithology
Lower Cretaceous	Gondwana	Chandia	Fine to medium grained Sandstone
-----Faulted Contact-----			
Proterozoic	Vindhyan		Sandstone, Shale, Conglomerate
-----Unconformity-----			
Early Proterozoic to Archaean	Mahakoshal	Intrusives	Quartz veins, Quartz porphyre veins Mafic and Ultramafic intrusives
		Bhitrigarh Formation	Phyllite with bands of quartzite, Conglomerate
		-----Unconformity-----	
		Sleemanabad Formation	Dolomite, Limestone with bands of BIF, Manganiferous chert, quartzite and metabasalts, pyroclasts

1.7.0 Regional Structure

- 1.7.1 **Diastrophic Structures** The overall structural framework of the Mahakoshal belt is represented by a series of upright to slightly overturned folds on southerly dipping axial planes and the folds developed during the initial stage of deformation were refolded into nearly vertical to reclined folds during the course of the progressive deformation, especially in the vicinity of the shear zones. According to Roy and Bandyopadhyay (1990), the Supracrustal rocks of the Mahakoshal belt have been involved in folding of at least three generations (D1, D2 & D3) and the present day ENE-WSW disposition of the belt is due to the development of D1 and D2 structures. The shear zone rocks include a part of the Mahakoshal Supracrustal and the granitoids occurring further on the southern margin. The mylonitic foliation within the shear zone is parallel to the schistosity of the dominant folds (D1) and sheath like folds are found in the mylonites. The North to NNW subhorizontal shortening across a large terrain of the deformed rocks and a shearing movement superimposed over the regional strain along the steep southerly dipping slip/shear planes represented by slip faults (Abhinaba Roy and M. K. Devarajan).
- 1.7.2 The regional strike of the Mahakoshal Group of rocks is ENE-WSW to East-West with dips ranging from 55° to 80°. Presence of isoclinal folds, asymmetrical folds and

cross folds, reflect the deformational events. The earliest recognized folding which has generated tight, isoclinal, reclined folds with sub vertical axial planes is represented by a closure at Pan Umariya village located at south west of the Imaliya village. The pervasive foliation in the volcano sedimentary sequence, which strikes in ENE-WSW direction and was generated during this deformation, is seen in this part of the Mahakoshal belt. The plunge of the folds is towards SSE. The second event of the deformation has developed folds with sub vertical axial planes with axis plunging very gently either ENE or WSW. Both of these events have developed folds which are co-axial but one has a gentle plunge whereas the other has steep plunge of axis. Topography in this part is also representing ENE-WSW trending alternate hills and valleys. The third event, which has NNW-SSE axial trend with open warps where cross faults are present, has caused discontinuity or gap in these ridges. This particular activity is most important in the Mahakoshal belt for localization of mineralisation. The above mentioned diastrophic structures like foliation, mesoscopic and minor folds, are reflecting the deformational history of the supracrustals in the present area. In the central part of Mahakoshal belt fold closures of the major folds as such are not well preserved, however, some of the F2 fold closures seen in the central part are at Pan Umariya, Sihora and Tindni which also represent the large scale folds of the Mahakoshal belt. The map scale folds and minor folds have varying plunges which are either plane cylindrical or non-planar and non-cylindrical, tight to isoclinal, upright to reclined folds. These may overall represent sheath geometry. These are seen in the Sarda area (23°28'31":80°08'41", 64A/3) in the central part of the Mahakoshal belt (Singhai and Keshava Prasad, 1997-98). Plunge in the minor fold of Tindni closure, which is plane, cylindrical, upright to reclined fold, varies from 15° to 80° both towards ENE and WSW as observed in this part of the Mahakoshal belt. Such variations have been attributed to inhomogeneous nature of the strata in the area (Roy and Bandyopadhyay, 1990).

1.7.3 Non Diastrophic Structures

The non-diastrorphic structures and planar features like bedding is represented by compositional layering within the BIF, colour banding in the chert and jasper bands and alternate silica rich and mica rich layers within the metapelites of the Mahakoshal

belt. The colour banding in the dolomite and chert, which is a dominant unit in this part, is exhibited by light to dark greyish tone and pink to pinkish & purple impurities in chert bands. Intercalations of phyllite within the dolomite and calcareous intercalations in argillaceous rocks are reflecting the depositional characters. Thin sedimentary units, which are of arenaceous nature, are also found in the calcareous and argillaceous rocks. The variation in grain size, fineness and coarseness are characteristic of these units. Presence of intra-formational conglomerate and its gradation towards coarseness or fineness is indicative of its depositional nature. In this part, the regional stratification is ENE-WSW to WNW-ESE with sub vertical dips varying from 70° to 80° due south. Meta basaltic flows, which occur in Shahdar and Madhana area upto east of Pan Umaria show flow structures like vesicles filled with secondary materials or minerals. Flows may contain Pahaehoe like features and these may have development of pillow structure as has been suspected from the north eastern part of Dungaria in Sleemanabad area.

1.8.0 Geology of the Block

The area mostly exposes lithounits belonging to Early Proterozoic to Archaean aged Mahakoshal Group of Rocks comprising Quartz veins, Quartz porphyre veins, Mafic and Ultramafic intrusive, Phyllite with bands of quartzite, Conglomerate Dolomite, Limestone with bands of BIF, Manganiferous chert, quartzite and metabasalts, pyroclasts. The tentative stratigraphic sequence of litho units exposed in the Block area (After GSI) is given in Table I.B.

Table I.B
Stratigraphic sequence of the Salaiya G4 Block
(After GSI)

Age	Supergroup	Formation/Beds	Lithology
Early Proterozoic to Archaean	Mahakoshal	Intrusives	Quartz veins, Quartz porphyre veins Mafic and Ultramafic intrusives
		Bhitrigarh Formation	Phyllite with bands of quartzite, Conglomerate
		-----Unconformity-----	
		Sleemanabad Formation	Dolomite, Limestone with bands of BIF, Manganiferous chert, quartzite and metabasalts, pyroclasts

1.9.0 Mineral Potentiality based on geology and ground geochemistry etc.

1.9.1 Iron and Manganese mineralization associated with the Early Proterozoic aged Mahakoshal Group of rocks has been present in the area marked by the presence of BIF and Mn bearing Phyllites etc. Previous agencies have also observed the presence of Iron and Manganese and several old working pits are present in the area. Banded Hematite Jasper (BHJ) in the area occurs mainly as a simultaneous layering of hematite and jasper. Hematite is in dark reddish-black colored and Jasper is in dark pinkish colored. Banded Hematite Quartzite (BHQ) are present in the area with an alternate layering of hematite and quartz bands. Hematite layer is having a dark reddish black colour and quartz is white in colour.

1.9.2 Phyllites are exposed in the moderate to low lying areas. In general, it represents low-grade metamorphic activities. At places, they are grey to yellow in colour but near the contact of manganese body, they are in whitish or greyish in colour. As far as a mineral constituent of manganese ore is concerned, psilomelane and pyrolusite are the dominant manganese bearing minerals in the area. Psilomelane is greyish in colour with a brownish tint and occurs as finely crystalline aggregate and colloidal form. It is strongly anisotropic with high birefractance due to variable hardness. Pyrolusite shows greyish coloured with blueish tint and occur as fine grains colloidal and stalactitic forms. It has also very high anisotropism and reflectance. Shrinkage cracks are also very common which are formed due to the loss of water possible at the time of formation.

2.0.0 Previous Work

2.1.0 The southern limit of Mahakoshal Group has been a matter of debate as most of the mappers had shown granite, granite gneiss, schist and metamorphics occurring to the south as basement for Mahakoshal Group. In the “Field Workshop” on Mahakoshal Group (10 & 11 April 2004), it was well established that most of the granites are of intrusive nature and the enclaves of schist/phyllite within them are part of Mahakoshal Group.

2.2.0 The F.R. Mallet & Huges in 1833 surveyed the parts of Jabalpur District. and identified iron ore deposits associated with BIF and laterites in the area. He mentioned the presence of iron ore bands of varying thickness in the area. Earlier workers (Fermor, 1990; Krishnan, 1939) have described these gneisses and metasedimentary rocks equivalent to Dharwar Group of rocks.

2.3.0 Then, G.R. Rao of the DGM, MP in 1959, examined this area and referred the iron ore reserve to be low to medium grade. S.S. Mishra of the DGM, MP in 1961 established that the iron ore bands continue has vast continuation in the area.

2.4.0 Sharma R.K. (1962 - 63) and Tiwari R.K (1964- 65) mapped in and around the area and has shown banded quartzite, dolomite, phyllite and epidiorite as unclassified unit. In the basin clastic sediments were deposited first, followed by chemogenic sediments; the chert and dolomites and the intermittently basic lavas.

2.5.0 Subsequent compilation of Quadrangle Geological Map (QGM)by GSI has shown these rocks as unclassified Mahakoshal and older granite gneisses. Previous exploration was conducted by Geological Survey of India, Jabalpur at G4 stage having titled “Investigation for Iron Ore in Sihora and Gosalpur area in Jabalpur district” during FSP 2015-2017.

2.6.0 Active Mines and Exploration blocks of Iron and Manganese are there in the close vicinity of the block. In adjacent blocks agencies are getting Fe and Mn values more than the IBM threshold values.

3.0.0 FIELD VISIT BY MECL

MECL has conducted field visit in the proposed block. During geological traverses, MECL has found the host rocks viz. BIF and Phyllites at several places. Samples from 4 Nos. of zones are analysed through handheld XRF and in MECL Chemical Lab. Samples are showing upto 53 % Fe value in XRF Analysis. Further, these samples are analysed in MECL Chemical Lab, Nagpur. The analytical results shown in hand held XRF are mentioned below:

Table III.A – Analysis Results of Samples by Hand held XRF

Sample ID	Latitude	Longitude	Hand held XRF Result in %			
			Fe%	Al%	Si%	Mn%
P-2	23.59763853°	80.24949566°	35.86	7.97	6.17	13.4
P-3	23.59601691°	80.24915334°	53.23	1.94	2.03	7.90
P-7	23.58033148°	80.16496483°	48.30	6.18	8.41	-
P-8	23.60811101°	80.22541042°	40.04	4.43	4.71	-



A. Location of the sample collected from the mineralization area in the Proposed Block



B. Field photograph of showing BIF near Salaiya in the Proposed Block



C. Field photograph of showing BIF near Salaiya in the Proposed Block



D. Field photograph of showing BIF near Chhapra in the Proposed Block

4.0.0 Block description

4.1.0 The proposed G-4 block for Iron and Manganese and associated minerals falls in Survey of India Toposheet No. 64A/02 and 64A/06 and covers an area of 110.56 sq. km in and around villages Amoch, Majauli, Mahgawan, Chhapra, Salaiya, Imaliya etc. of Jabalpur, Katni and Umaria Districts, State Madhya Pradesh. The block location is given in **PLATE-I**. The Co-ordinates of the corner points of the block area both geodetic and UTM are given in **Table No.-IV.A**.

Table-IV.A Coordinates of cardinal points of Salaiya Iron-Manganese G4 Block (110.56 Sq. Km.)					
Sl. No.	Corner	DD° MM' SS" (WGS84)		UTM 44N	
	Points	LONGITUDE	LATITUDE	Easting(X)	Northing(Y)
1	A	80° 09' 04.6645"E	23° 34' 09.7075"N	413390.39	2606806.89
2	B	80° 09' 55.5750"E	23° 35' 11.8156"N	414844.75	2608708.51
3	C	80° 13' 00.0208"E	23° 37' 09.9689"N	420092.67	2612312.69

Table-IV.A Coordinates of cardinal points of Salaiya Iron-Manganese G4 Block (110.56 Sq. Km.)					
Sl. No.	Corner	DD° MM' SS" (WGS84)		UTM 44N	
	Points	LONGITUDE	LATITUDE	Easting(X)	Northing(Y)
4	D	80° 15' 10.9591"E	23° 37' 45.4133"N	423808.8	2613382.9
5	E	80° 15' 55.7243"E	23° 38' 25.4396"N	425083.55	2614607.3
6	F	80° 15' 57.2706"E	23° 38' 55.1753"N	425132.06	2615521.57
7	G	80° 16' 46.8387"E	23° 39' 58.0588"N	426546.12	2617448.35
8	H	80° 17' 54.8344"E	23° 38' 59.9824"N	428463.46	2615652.67
9	I	80° 17' 53.4368"E	23° 38' 32.9506"N	428419.78	2614821.53
10	J	80° 18' 19.4907"E	23° 38' 33.2165"N	429157.98	2614826.1
11	K	80° 17' 59.1869"E	23° 35' 28.0544"N	428554.85	2609134.45
12	L	80° 17' 31.9038"E	23° 35' 13.6968"N	427779.38	2608696.7
13	M	80° 13' 50.2188"E	23° 33' 14.4103"N	421476.22	2605060.57
14	N	80° 11' 6.5676"E	23° 31' 21.8507"N	416816.81	2601624.53

5.0.0 Planned Methodology

In accordance to the objective set for reconnaissance survey (G-4) of the block, the exploration programme is proposed. The Exploration shall be carried out as per Minerals (Evidence of Mineral Contents) 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

Geological mapping will be done in the entire 110.56 sq km area on 1:12,500 scale. Rock types, their contact, structural features will be mapped. Surface manifestations of the ore bodies available along with their surface disposition will be marked on map.

5.2.0 Surveying:

During exploratory drilling of scout borehole, fixation and determination of reduced level and co-ordinates of the boreholes will be undertaken by DGPS/ Total station.

5.3.0 Surface Geochemical sampling (Bed Rock/Channel Sample): During the course of Geochemical Sampling the bed rock /channel samples shall be collected from the outcrops.

5.4.0 Exploratory Mining (Trenching/Pitting) Shallow trenching/pitting (Excavation) shall be carried out in the potential zones identified based on the results of geological

mapping and geochemical sampling. A provision of shallow trenching/pitting of 200 cubic meter has been planned. Trenching work will be carried out by cutting trenches of 1m width and 2 m depth directly on the fresh outcrop/rock exposures across the Fe and Mn ore bearing formation. Locations of pits/trenches on ground will be decided by field geologist based on field observations. Trench walls will be geologically mapped.

5.5.0 Bed Rock/Channel Sample/Trench Samples: A total of 300 no of primary, 15 no of internal check and 30 no of external check Bedrock/Channel/Trench samples will be collected. Out of Total 300 samples, 150 samples will be for Iron and 150 samples will be for Manganese. Sample taken for Iron will be analysed for 4 Radicals Fe, Al_2O_3 , P_2O_5 & SiO_2 while samples for Manganese will be analyzed for Mn, SiO_2 , P_2O_5 , Fe_2O_3 , MnO_2 and Acid insolubles.

5.6.0 Core Drilling:

5.6.1. Based on Geological mapping, Geochemical studies and Shallow trenching/pitting (Excavation), the extension of the mineralized zones (ore bodies) will be marked. To find out the potentiality of mineralized zones in strike & dip direction, 8 Nos of scout boreholes involving 500m of drilling will be carried out for upper level of intersection of mineralized zones.

5.6.2. **Drill Core Logging:** The borehole cores would be logged systematically. Details of the litho units, colour, structural feature, texture, mineralization, % recovery of core, rock quality designation (RQD) etc. would be recorded.

5.7.0 Drill Core Sampling:

5.7.1. The mineralized (Iron and Manganese) part of drill core will be sampled as Primary sample. The length of each sample will be kept 1.00 m within the ore zone depending upon the thickness of particular type of manganese ore and its physical character. The primary core samples for Iron will be analysed for 4 Radicals Fe, Al_2O_3 , P_2O_5 & SiO_2 . While, primary core samples for manganese mineralisation will be analysed for 6 radicals' i.e. Mn, SiO_2 , P_2O_5 , Fe_2O_3 , MnO_2 and Acid insolubles. The cores of rocks 3 m immediate on footwall and 3 m immediate on hanging wall of mineralized zones would be sampled at 1.0 m interval, as far as possible,

depending upon the intensity of mineralization, change in lithology and core recovery etc.

- 5.7.2. A total of 115 no of core samples (100 no Primary & 15 no Check samples) shall be generated from the Iron mineralized zones to be intersected in the boreholes. Samples will be analysed for 4 Radicals Fe, Al_2O_3 , P_2O_5 & SiO_2 . A total of 115 no of core samples (100 no Primary & 15 no Check samples) shall be generated from the Manganese mineralized zones to be intersected in the boreholes. Samples will be analysed for manganese mineralization (Mn, SiO_2 , P_2O_5 , Fe_2O_3 , MnO_2 and Acid Insolubles)
- 5.7.3. Internal check samples (5% of Primary samples) will be analyzed in Chemical Laboratory of MECL and 10% of Primary samples will be sent as External Check Samples to NABL External Labs
- 5.7.4. Total 20 Nos of composite samples will be analysed for 4 Radicals Fe, Al_2O_3 , P_2O_5 & SiO_2 .
- 5.7.5. Total 20 Nos of composite samples will be analysed for Mn, SiO_2 , P_2O_5 , Fe_2O_3 , MnO_2 and Acid Insolubles.

5.8.0 Whole Rock Analysis:

- 5.8.1. Whole Rock analysis for SiO_2 , Al_2O_3 , Fe_2O_3 , TiO_2 , MnO, CaO, Na₂O, K₂O+H₂O, MgO, P_2O_5 , CO₂, & S radicals will be carried out on 10 Nos samples to check the rock types, their variation in chemical composition.

5.9.0 Bulk Density

- 5.9.1. A total of 10nos. samples (5 nos. for Fe and 5 nos. for Mn) will be analysed for bulk Density determination.

5.10.0 Petrological & Mineralogical Studies:

- 5.10.1. During the course of Geological mapping and core logging 15 samples from various litho units from surface, Pit/Trenh/Channels and lithounits intersected in boreholes will be studied for petrography and 20 samples from mineralized zones will be studied for the ore mineral assemblages and their distribution, alteration, enrichment etc in polished sections.

- 5.11.0 XRD Studies:** XRD studies will be done on 20 nos. of Composite samples.

5.12.0 Trace element Studies: Trace element Studies will be done on 20 nos. for 34 elements

5.13.0 Lumps/Fines determination for massive Iron ore: Lumps/Fines determination will be done on 5 Cu.M from pitting.

5.14.0 Lumps/Fines determination for float Iron ore: Lumps/Fines determination will be done on 5 Cu.M from pitting.

5.15.0 Justification :

5.15.1. The Govt. of India enacted the MMDR Amendment Act-2015 duly introducing the system of auction for allocation of Mineral Concessions. Manganese has been categorized in the Fourth Schedule which needs prospecting and exploration by the State Govt. before auctioning of blocks. The area belongs to the Mahakoshal Group which is well known for various mineral resources including Iron and Manganese. Mineralisation of Iron is occurring around the area associated with Banded Iron Formation (BIF) while Manganese is associated with BIF and Phyllites. Several active Mines of Iron and Manganese are there in the close vicinity of the block including an exploration block of NMDC in south of the proposed block for Fe-Mn. MECL has conducted field visit in the proposed block. During geological traverses, MECL has identified BIF and Phyllites at several places, collected 4 nos. of samples and analysed them through handheld XRF and in MECL Chemical Lab. Samples are showing upto 53 % Fe and Mn upto 13.7%. Based on the mineralization evidences of Iron and Manganese in and around the block, the present Reconnaissance Survey exploration program at G-4 level has been prepared. Geological mapping, surface sampling and pitting/trenching will be helpful in assessing the disposition of the mineralized zones, structural features etc. The Exploration will be helpful in estimation of reconnaissance resources of Iron and Manganese and associated minerals in the block area. Geochemical sampling of BRS/CS/ Pitting/trenching and the drilling of scout boreholes will be helpful in assessing the disposition. The Reconnaissance Survey (G4) will eventually help in planning of detailed exploration program (incase upgraded to G-3 level) which in turn will facilitate the state Government for action of block.

5.16.0 Nature Quantum and Target

5.16.1. Details of the particular, Quantum and the targets are tabulated in **Table No.-V.A.**

Table No-V.A
Envisaged Quantum of proposed work in Salaiya G4 Block

Sl. No.	Item of Work	Unit	Proposed Quantum of work
1	Geological Mapping (on 1:12,500 Scale)	Sq. Km.	110.56
2	Survey Work		
	i) Bore Hole Fixation	Nos	8
	ii) RL & Coordinate Determination by DGPS	Nos	15
3	Trenching	Cu. m	200
4	Core Drilling (8 Scout Boreholes)	m.	500.00
5	Sample Preparation & Chemical Analysis		
A.	Primary samples for Iron (Bedrock/Channel /Trench/Core Samples)		
	i) Primary samples for 4 Radicals Fe, Al ₂ O ₃ , P ₂ O ₅ & SiO ₂	Nos.	250
	ii) Internal Check samples (5% of Primary samples) for 4 radicals	Nos.	13
	iii) External Check sample (10% of Primary samples) for 4 radicals	Nos.	25
B.	Primary samples for Manganese (Bedrock/Channel /Trench/Core Samples)		
	i) Primary samples for 6 radicals i.e. Mn, SiO ₂ , P ₂ O ₅ , Fe ₂ O ₃ , MnO ₂ and Insolubles	Nos.	250
	ii) Internal Check samples (5% of Primary samples) for 6 radicals	Nos.	13
	iii) External Check sample (10% of Primary samples) for 6 radicals	Nos.	25
C.	Composite Samples for Manganese (Core) for 4 Radicals Fe, Al ₂ O ₃ , P ₂ O ₅ & SiO ₂	Nos.	20
D.	Composite Samples for Manganese (Core) for 6 radicals i.e. Mn, SiO ₂ , P ₂ O ₅ , Fe ₂ O ₃ , MnO ₂ and Insolubles	Nos.	20
6	XRD (Composite Samples)	Nos.	20
7	Trace Elements Studies (34 Elements)	Nos.	20
8	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
9	Petrographic Studies	Nos	15
10	Mineragraphic Studies	Nos	20
11	Lumps/Fines determination for massive Iron ore	Cu. m	5
12	Lumps/Fines determination for Float Iron ore:	Cu. m	5
13	Report Preparation (Digital format)	Nos.	1

6.0.0 Manpower Deployment

6.1.0 Manpower deployment List will be provided later.

7.0.0 Break-up of Expenditure

7.1.0 Tentative Cost has been estimated based on Schedule of Charges (SoC) of projects funded by National Mineral Exploration Trust (NMET) w.e.f. 01/04/2020. The total estimated cost is Rs. **189.05 Lakh**. The summary of tentative cost estimates for Reconnaissance Survey (G-4 Level) is given in **Table No.-VI.A** and details of tentative cost estimates is given in **Table No.-VI.B**. Tentative Time schedule/action plan for proposed Reconnaissance Survey (G-4) is given in **Table No. VI-C**.

Table No-VII.A

**Summary of Tentative Cost Estimates for Reconnaissance Survey (G-4 Level)
Exploration**

Sl. No.	Item	Total
1	Geological Work	3,182,280
2	Pitting & Trenching	666,000
3	Drilling	7,880,700
4	Laboratory Studies	3,220,925
	Sub total	14,949,905
5	Report	747,495
6	Peer Review	10,000
7	Proposal Prepration	313,948.01
	Total	16,021,348
8	GST (18%)	2,883,842.69
Total cost including 18% GST		18,905,191
SAY, in Lakhs		189.05

Estimated cost for Reconnaissance survey (G4) for Iron, Manganese and associated minerals in Salaiya, Districts: Jabalpur, Katni & Umaria, State: Madhya Pradesh. [Block area- 110.56 sq. km; Nos. of Borehole- 8; Borehole depth range- 60m; Schedule timeline- 14 months]							
S. No.	Item of Work	Unit	Rates as per NMET SoC 2020-21		Estimated Cost of the Proposal		Remarks
			SoC-Item -SI No.	Rates as per SoC	Qty.	Amount (Rs)	
A	GEOLOGICAL WORK (1:12,500 scale)						
i	Charges for one Geologist- Field	day	1.2	11,000	180	1,980,000	
ii	Charges for one Geologist per- HQ	day	1.2	9,000	60	540,000	
iii	2 labours/ party (Rs 477/day/labour) (As per rates of Central Labour Commissioner)	day	5.7	477	360	171,720	Amount will be reimburse as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher
iv	Core Sampling -1 Samplers Labour charge not included	day	1.5.2	5,100	70	357,000	
v	4 labours/ party (Rs 477/day/labour) (As per rates of Central Labour Commissioner)	day	5.7	477	280	133,560	Amount will be reimburse as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher
					Sub Total- A	3,182,280	
B	PITTING AND TRENCHING						
i	Trenching	Cu m	2.1.1	3330	200	666,000	
					Sub Total- B	666,000	
C	DRILLING						
i	Drilling upto 300m (Hard Rock) (1 rigs)	m	2.2.1.4a	12,650	500	6,325,000	
ii	Borehole deviation Survey	m	2.2.6	-	-	-	
iii	Land / Crop Compansation	per BH	5.6	20,000	8	160,000	Amount will be reimburse as per actuals or max. Rs. 20000 per BH with certification from local authorities
iv	Construction of concrete Pillar (12"x12"x30")	per borehole	2.2.7a	2,000	8	16,000	
v	Transportation of Drill Rig & Truck associated per drill	Km	2.2.8	36	800	28,800	Certification in this regard is required to be provided
vi	Monthly Accomodation Charges for drilling Camp (up to 2 Rigs)	month	2.2.9	50,000	5	250,000	
vii	Drilling Camp Setting Cost	Nos	2.2.9a	250,000	1	250,000	
viii	Drilling Camp Winding up Cost	Nos	2.2.9b	250,000	1	250,000	
ix	Approach Road Making (Flat Terrain)	Km	2.2.10a	22,020	5	110,100	Road Making will be considered as per the requirement and Road Making Charges will be reimbursed for max. 4 km.
x	Bore Hole Fixation and determination of co-ordinates & Reduced Level of the boreholes and by DGPS	Nos	1.6.2	19,200	9	172,800	*8 Boreholes and 1 base station
xi	One complete borehole plus mineralised cores of all the remaining Bhs	m	5.3	1,590	200	318,000	This amount will be reimbursed after successful delivery of the cores to concerned libraries/authorities
					Sub Total- C	7,880,700	
D	LABORATORY STUDIES						
1	Chemical Analysis						
i	Primary & Check samples for Iron (BRS/Channel/Trench/Core)						
	a. Primary Samples for 4 Radicals Fe, Al2O3, P2O5 & SiO2	Nos	4.1.15a	4,200	250	1,050,000	150 nos. sample BRS/Trench/channel & 100 nos. Core samples
	b.Internal (5%) Check samples for 4 Radicals Fe, Al2O3, P2O5 & SiO2	Nos	4.1.9	4,200	13	54,600	
	c.External(10%) Check samples from NABL Lab for 4 Radicals Fe, Al2O3, P2O5 & SiO2	Nos	4.1.9	4,200	25	105,000	
ii	Primary & Check samples for Maganese (BRS/Channel/Trench/Core)						
	a. Primary Samples for 6 radical (Mn, SiO2, P2O5, Fe2O3, MnO2 and Insolubles)	Nos	4.1.15a	4,200	250	1,050,000	150 nos. sample BRS/Trench/channel & 100 nos. Core samples
	b-Internal (5%) Check samples for 6 radical (Mn, SiO2, P2O5, Fe2O3, MnO2 and Insolubles)	Nos	4.1.15a	4,200	13	54,600	
	c-External(10%) Check samples from NABL Lab for 6 radical (Mn, SiO2, P2O5, Fe2O3, MnO2 and Insolubles)	Nos	4.1.15a	4,200	25	105,000	
iii	Composite samples for Iron						
	a. Composite Samples for 3 Radicals Fe, Al2O3, P2O5, & SiO2	Nos	4.1.15a	4,200	20	84,000	
iv	Composite samples for Maganese						
	a. Composite Samples for 6 radical (Mn, SiO2, P2O5, Fe2O3, MnO2 and Insolubles)	Nos	4.1.15a	4,200	20	84,000	
v	XRD (Composite Samples)	Nos	4.5.1	4,000	20	80,000	
vi	Trace element study (34 Elements)	Nos	4.1.14	7,731	20	154,620	
2	Physical & Petrological Studies						
i	Preparation of thin section	Nos	4.3.1	2,353	15	35,295	
ii	Complete petrographic study report	Nos	4.3.4	4,232	15	63,480	
iii	Preparation of polished section	Nos	4.3.2	1,549	20	30,980	
iv	Complete mineragraphic study report	Nos	4.3.4	4,232	20	84,640	
v	Digital Photographs	Nos	4.3.7	280	30	8,400	
vi	Whole Rock Analysis (Major oxide and 8 additional trace elements)	Nos	4.1.15a & b	7,568	10	75,680	
vii	Bulk Density	No.	4.1	3,540	10	35,400	
viii	Lumps/Fines determination for massive Iron ore	Cu.M.	4.9	6,523	5	32,615	
ix	Lumps/Fines determination for Float Iron ore	Cu.M.	4.9	6,523	5	32,615	
					Sub Total- D	3,220,925	
E					Total A to D	14,949,905	
F	Geological Report Preparation		5.2	For the projects having cost exceeding Rs. 50 lakhs and less than Rs. 150 lakhs - A minimum of Rs. 2.5 lakhs or 5% of the value of work whichever is more		747,495	Reimbursement will be made after submission of the final Geological Report in Hard Copies (5 Nos) and the soft copy to NMET.
G	Peer review Charges		As per EC decision			10,000	
H	Preparation of Exploration Proposal (5 Hard copies with a soft copy)	5 Hard copies with a soft copy	5.1	2% of the Cost or Rs. 3.8 Lakhs whichever is lower		313,948	EA has to submit the Hard Copies and the soft copy of the final proposal along with Maps and Plan as suggested by the TCC-NMET in its meeting while clearing the proposal.
I	Total Estimated Cost without GST					16,021,348	
J	Provision for GST (18% of I)					2,883,842.69	GST will be reimburse as per actual and as per notified prescribed rate
K	Total Estimated Cost with GST					18,905,190.94	
				or Say Rs. In Lakhs		189.05	
Note:							
1	If any part of the project is outsourced, the amount will be reimbursed as per the Paragraph 3 of NMET SoC and Item no. 6 of NMET SoC. In case of execusion of the project by NEA on its own, a Certifiare regarding non outsourcing of any component/project is required.						

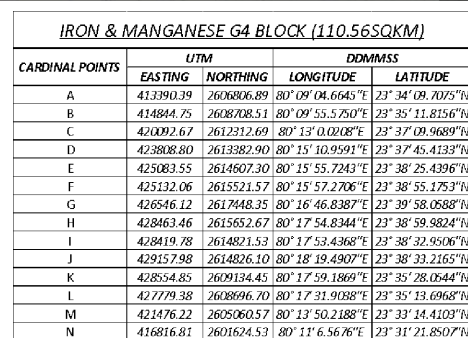
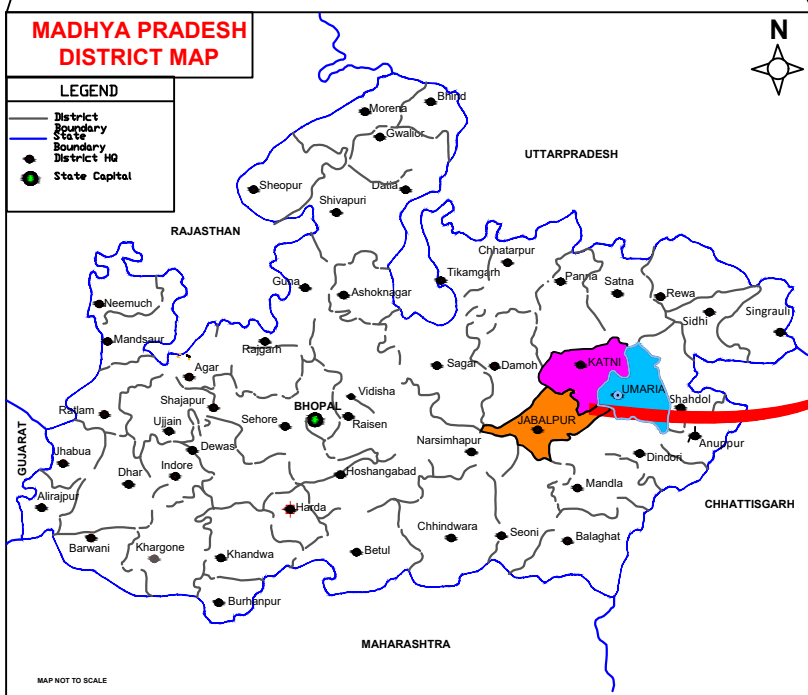
Estimated cost for Reconnaissance survey (G4) for Iron, Manganese and associated minerals in Salaiya, Districts: Jabalpur, Katni & Umaria, State: Madhya Pradesh.

[Block area- 110.56 sq. km; Nos. of Borehole- 8; Borehole depth range- 60m; Schedule timeline- 14 months]

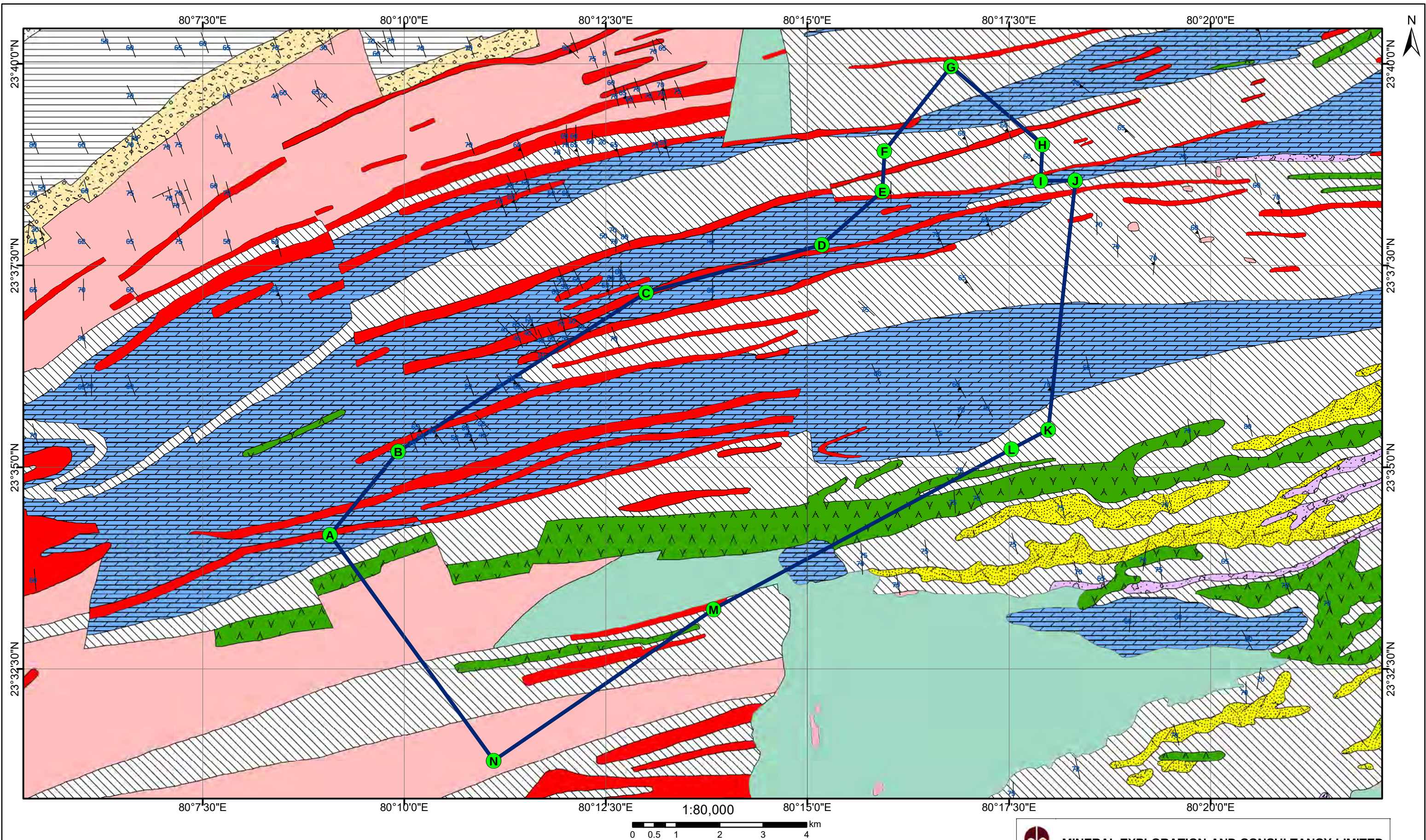
S. No.		Months /Days	1	2	3	4	5	6	Review	7	8	9	10	11	12	13	14
1	Camp Setting	months															
2	Geological	months															
3	Trenching	cu.m															
4	Drilling (1 rig)	m															
5	Geologist days	days															
6	Sampling days, Core Sampling	days															
7	Camp winding	months															
8	Laboratory Studies	months															
9	Geologist days, HQ	days															
10	Report Writing with Peer Review	months															

List of Plates:

1. Plate-I: Location Map of the Proposed Salaiya block, Jabalpur, Katni & Umaria Distt., State Madhya Pradesh
2. Plate-II: Regional Geological Map with Proposed Salaiya block, Jabalpur, Katni & Umaria Distt., State Madhya Pradesh



DISTRICT BOUNDARY



Legend

- Corner Points of Proposed Block
- Salaiya G4 Block
- BEDDING
- CLEAVAGE/FOLIATION/SCHISTOSITY (S1)

Lithology

- BIF
- CONGLOMERATE
- DOLOMITE
- LATERITE
- META BASALT
- PHYLLITE
- QUARTZITE
- SANDSTONE
- SANDSTONE AND ORTHOQUARTZITE
- SHALE
- SILT



MINERAL EXPLORATION AND CONSULTANCY LIMITED

REGIONAL GEOLOGY MAP (AFTER GSI)		
RECONNAISSANCE SURVEY (G4 STAGE) FOR IRON & MANGANESE IN SALAIYA BLOCK		
DISTRICT: JABALPUR, KATNI & UMARIA		STATE: MADHYA PRADESH
R.F. 1:80,000		
PARTS OF TOPOSHEET NO. – 64A/02 & 64A/06		
PREPARED BY- EXPLORATION DIVISION, MECL, NAGPUR		
M.E.C.L / EXPL./JAN-2023	PLATE-II	2

Estimated cost for Reconnaissance survey (G4) for Iron, Manganese and associated minerals in Salaiya, Districts: Jabalpur, Katni & Umaria, State: Madhya Pradesh. [Block area- 110.56 sq. km; Nos. of Borehole- 8; Borehole depth range- 60m; Schedule timeline- 14 months]							
S. No.	Item of Work	Unit	Rates as per NMET SoC 2020-21		Estimated Cost of the Proposal		Remarks
			SoC-Item -SI No.	Rates as per SoC	Qty.	Amount (Rs)	
A	GEOLOGICAL WORK (1:12,500 scale)						
i	Charges for one Geologist- Field	day	1.2	11,000	180	1,980,000	
ii	Charges for one Geologist per- HQ	day	1.2	9,000	60	540,000	
iii	2 labours/ party (Rs 477/day/labour) (As per rates of Central Labour Commissioner)	day	5.7	477	360	171,720	Amount will be reimburse as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher
iv	Core Sampling -1 Samplers Labour charge not included	day	1.5.2	5,100	70	357,000	
v	4 labours/ party (Rs 477/day/labour) (As per rates of Central Labour Commissioner)	day	5.7	477	280	133,560	Amount will be reimburse as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher
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C	DRILLING						
i	Drilling upto 300m (Hard Rock) (1 rigs)	m	2.2.1.4a	12,650	500	6,325,000	
ii	Borehole deviation Survey	m	2.2.6	-	-	-	
iii	Land / Crop Compansation	per BH	5.6	20,000	8	160,000	Amount will be reimburse as per actuals or max. Rs. 20000 per BH with certification from local authorities
iv	Construction of concrete Pillar (12"x12"x30")	per borehole	2.2.7a	2,000	8	16,000	
v	Transportation of Drill Rig & Truck associated per drill	Km	2.2.8	36	800	28,800	Certification in this regard is required to be provided
vi	Monthly Accomodation Charges for drilling Camp (up to 2 Rigs)	month	2.2.9	50,000	5	250,000	
vii	Drilling Camp Setting Cost	Nos	2.2.9a	250,000	1	250,000	
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ix	Approach Road Making (Flat Terrain)	Km	2.2.10a	22,020	5	110,100	Road Making will be considered as per the requirement and Road Making Charges will be reimbursed for max. 4 km.
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xi	One complete borehole plus mineralised cores of all the remaining Bhs	m	5.3	1,590	200	318,000	This amount will be reimbursed after successful delivery of the cores to concerned libraries/authorities
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	b-Internal (5%) Check samples for 6 radical (Mn, SiO2, P2O5, Fe2O3, MnO2 and Insolubles)	Nos	4.1.15a	4,200	13	54,600	
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vi	Whole Rock Analysis (Major oxide and 8 additional trace elements)	Nos	4.1.15a & b	7,568	10	75,680	
vii	Bulk Density	No.	4.10	3,540	10	35,400	
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ix	Lumps/Fines determination for Float Iron ore	Cu.M.	4.9	6,523	5	32,615	
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E					Total A to D	14,949,905	
F	Geological Report Preparation		5.2	For the projects having cost exceeding Rs. 50 lakhs and less than Rs. 150 lakhs - A minimum of Rs. 2.5 lakhs or 5% of the value of work whichever is more		747,495	Reimbursement will be made after submission of the final Geological Report in Hard Copies (5 Nos) and the soft copy to NMET.
G	Peer review Charges		As per EC decision			10,000	
H	Preparation of Exploration Proposal (5 Hard copies with a soft copy)	5 Hard copies with a soft copy	5.1	2% of the Cost or Rs. 3.8 Lakhs whichever is lower		313,948	EA has to submit the Hard Copies and the soft copy of the final proposal along with Maps and Plan as suggested by the TCC-NMET in its meeting while clearing the proposal.
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Note:							
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Estimated cost for Reconnaissance survey (G4) for Iron, Manganese and**[Block area- 110.56 sq. km; Nos. of Borehole-**

S. No.		Months/ Days	1	2	3	4
1	Camp Setting	months				
2	Geological Mapping	months				
3	Trenching	cu.m				
4	Drilling (1 rig)	m				
5	Geologist days	days				
6	Sampling days, Core Sampling	days				
7	Camp winding	months				
8	Laboratory Studies	months				
9	Geologist days, HQ	days				
10	Report Writing with Peer Review	months				

and associated minerals in Salaiya, Districts: Jabalpur, Katni & Umaria, Pradesh.

8; Borehole depth range- 60m; Schedule timeline- 14 months]

[illegible]

State: Madhya

13

14

State: Madhya	
13	14