PROPOSAL FOR RECONNAISSANCE SURVEY (G-4)
FOR MANGANESE ORE IN
DHAVALAPUR BLOCK
(15.0 SQ. KM AREA)
DISTRICT- NAGPUR, MAHARASHTRA

COMMODITY: MANGANESE

BY

MINERAL EXPLORATION AND CONSULTANCY LIMITED
DR. BABASAHAB AMBEDKAR BHAWAN
SEMINARY HILLS

PLACE: NAGPUR
DATE: 15th MARCH 2024

Summary for Reconnaissance Survey (G-4) for manganese ore in Dhavalapur Block (15.0 sq.km area), District- Nagpur, Maharashtra

	Features	**Details**
	Block ID	**Dhavalapur Manganese Block**
	Exploration Agency	Mineral Exploration and Consultancy Limited (MECL)
	Commodity	**Manganese**
	Mineral Belt	Sausar Fold Belt (SFB)
	Budget & Time schedule to complete the project	179.83 lakhs & 14 months
	Objectives	Based on the geological data of 10(A) 2(B) cases, provided by DGM, Maharashtra and field visit by MECL geologist in and around Dhavalapur Block, Dist- Nagpur, Maharashtra, the present exploration programme for Reconnaissance Survey (G-4) has been formulated. The objectives of the present Reconnaissance Survey (G-4) are as follows: i) To carry out Geological & Structural mapping on 1:12,500 scale for identification of manganese bearing formation (host rock) with the structural features to identify the surface manifestation and lateral disposition of the mineralized zones. ii) To demarcate concealed manganese ore body by carrying out surface geophysical survey (S.P. and Magnetic) after completion of geological mapping. iii) To carry out trenching/pitting to expose manganese ore body under soil & lateritic cover. iv) To drill scout boreholes to prove the existence and establish persistence of manganese ore body over a promising strike length. v) To estimate reconnaissance (334) resource of manganese ore in the block as per UNFC norms & Minerals (Evidence of Mineral Contents) Rules- 2021.
	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.
	Name/Number of Geoscientists	
	Expected Field days (Geology, Geophysics, Surveyor)	Geologist Party days: Field -150 days & HQ-60 days
		Survey Party days: 45 days (for topographic survey)
		Geophysicist Party Days: Field -30 days & HQ-20 days
		Sampling Party days: 30 days (for geophysics)

<table>
<tr><td>1.</td><td>Location</td><td>The proposed exploration block is located in Parseoni Tehsil of Nagpur district and about 70 km in north of district headquarter Nagpur and about 30 km from tehsil headquarter Parseoni. The area falls under the parts of Survey of India Toposheet No 55O/2 and is bounded by latitude 21º 31' 21.32" N to 21º 33' 33.48" N and longitude 79° 05' 12.51" E to 79° 09' 04.05" E (Plate No I).</td></tr>
<tr><td></td><td>Latitude and Longitude</td><td>
<table>
<tr><th>BOUNDARY POINTS</th><th>LATITUDE</th><th>LONGITUDE</th></tr>
<tr><td>A</td><td>21º 33' 31.55" N</td><td>79º 6' 8.39" E</td></tr>
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</td></tr>
<tr><td></td><td>Villages</td><td>Dhavalapur, Savangi, Ambajhari, Banera, Narhar</td></tr>
<tr><td></td><td>Tehsil/Taluk</td><td>Parseoni</td></tr>
<tr><td></td><td>District</td><td>Nagpur</td></tr>
<tr><td></td><td>State</td><td>Maharashtra</td></tr>
<tr><td>2.</td><td>Area (hectares/ square kilometres)</td><td></td></tr>
<tr><td></td><td>Block Area</td><td>15.0 sq. km</td></tr>
<tr><td></td><td>Forest Area</td><td>Forest and Non-Forest area</td></tr>
<tr><td></td><td>Government Land Area</td><td>Data not available</td></tr>
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	Charagaha	Data not available
	Private Land Area	Data not available
3.	**Accessibility**	
	Nearest Rail Head	The nearest railhead is Nagpur (about 70 km) and nearest railway station is Koradih Railway Station (about 30 km).
	Road	The block area is well connected to district headquarter Nagpur, by all weather metalled road from the NH-07NH-47/SH-247 via Parseoni.
	Airport	The nearest airport is Dr. Babasaheb Ambedkar International Airport, Nagpur (about 75 km).
4.	**Hydrography**	
	Local Surface Drainage Pattern (Channels)	The general slope of the country is towards east and the drainage is collected by southerly flowing Pench River. The area has got dendritic pattern of drainage.
	Rivers/ Streams	Pench River towards east of the block
5.	**Climate**	
	Mean Annual Rainfall	Average annual rainfall is 100 cm
	Temperature:	Minimum temperatures: below 10°C (December-January), Maximum temperatures: up to 46°C (April-May)
6.	**Topography**	
	Toposheet Number	55O/2
	Morphology of the Area	The proposed block area covered under undulating terrain (hilly as well as flat terrain) with a gentle easterly slope. The hillocks are covered with forest and the flat area belongs to agriculture land. The average elevation ranges from 340m to 470 m above MSL with knolls and hillocks. The general slope of the country is towards east and the drainage is collected by southerly flowing Pench River. The Pench River lies towards east of the proposed block.
7.	**Availability of baseline geoscience data**	
	Geological Map (1:50K/25K)	1:50,000 (Bhukosh, Geological Survey of India)
	Geochemical Map	Not available.
	Geophysical Map (Aeromagnetic, ground geophysical, Regional as well as local scale GP maps)	Not available.
8.	**Justification for taking up Reconnaissance Survey/ Regional Exploration**	i) The Dhavalapur Manganese block is lapsed lease area by State Government of Maharashtra, which was granted as per section 10(A) 2(B) of the MMDR Act-15. The block was granted to Shri Amol B. Nagpure during 24/09/2004 to 23/09/2006 for 2 years.

		ii) The Directorate of Geology and Mining (DGM), Government of Maharashtra, Nagpur requested MECL to take up the exploration in lapsed 10(A) 2(B) mining lease areas vide letter no. Tech/1848/2023/3938, dated 22/12/2023. iii) Shri Amol B. Nagpure has carried out the prospecting in the area involving 5 pits and 2 trenches. They have analysed 7 no. of samples for manganese mineralisation in which MnO_2 ranges from 23.99 to 35.87% and Mn from 15.16 to 22.66. They have estimated 0.9 million tonnes manganese ore resources and mined out 200 tonnes of manganese ore with 25 to 30% MnO_2. iv) MECL studied the data provided by the DGM, Maharashtra and carried out the field visit in and around the Dhavalapur area. The geologist team studied the area and observed the surface indication of the manganese mineralisation in block area. They have also collected 4 nos. of samples for which analyses are awaited. v) Thus the manganese mineralisation in the area is confirmed both by previous data and the field visit by MECL geologists. vi) The manganese ore is the basic source to provide manganese as indispensable input in making of iron and all types of steels and so far there is no technology which can substitute manganese in steel making. Manganese is also categorised as notified mineral under Fourth Schedule of MMDR Amendment Act-2015, which prospecting and exploration is needed before auction. vii) Considering the request of DGM, Maharashtra, available data, field visit by MECL geologists and demand of manganese ore, MECL has planned to carry out exploration in the Dhavalapur Block and proposed Reconnaissance Survey (G-4) exploration in block to fulfil the demand of manganese in the country.

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FOR MANGANESE ORE IN DHAVALAPUR BLOCK
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1.0.0 INTRODUCTION

1.1.0 Preamble:

1.1.1 Manganese is one of the most common elements in the Earth's crust and is widely distributed across the planet's surface. It 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. Manganese ore is the basic source to provide manganese as indispensable input in making of iron and all types of steels. So far there is no technology which can substitute manganese in steel making. Manganese combines the twin benefits of relatively low price with outstanding technical usage.

1.1.2 In order to sustain the current level of production of Mn ores and to meet the future demands, the exploration of Manganese ore is the need of the hour.

1.1.3 In India the Manganese Ore deposits mainly occurs as metamorphosed bedded sedimentary deposits associated with Gondite Series (Archaeans) of Madhya Pradesh(Balaghat, Chhindwara&Jhabua districts), Maharashtra (Bhandara & Nagpur districts), Gujarat (Panchmahal district), Odisha (Sundargarh district) and Kodurite Series (Archaeans) of Odisha (Ganjam&Koraput districts) and Andhra Pradesh (Srikakulam& Vishakhapatnam districts).

1.1.4 The total reserves/resources of manganese ore in the country as on 1.04.2020 has been placed at 503.62 million tonnes as per NMI database, based on UNFC system (Mineral Year Book-2021). Out of these, 75.04 million tonnes are categorised as Reserves and the balance 428.58 million tonnes are in the Remaining Resources category. Gradewise, Ferromanganese grade accounts for 8%, Medium grade 6%, BF grade 29% and the remaining 57% are of Mixed, Low, Others, Unclassified, and Not-known grades including 0.16 million tonnes of Battery/Chemical grade (Mineral Year Book-2021).

1.1.5 Statewise, Odisha tops the total reserves/ resources with 34% share followed by Karnataka (24%), Madhya Pradesh (12%), Maharashtra (12%) & Goa (7%) , Andhra

Pradesh (6%) and Jharkhand (3%). Rajasthan, Gujarat, Telangana and West Bengal together shared the remaining 2% resources.

1.1.6 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.

1.1.7 The Dhavalapur Manganese block is lapsed lease area by State Government of Maharashtra, which was granted as per section 10(A) 2(B) of the MMDR Act-15. The block was granted to Shri Amol B. Nagpure during 24/09/2004 to 23/09/2006 for 2 years. The Directorate of Geology and Mining (DGM), Government of Maharashtra, Nagpur requested MECL to take up the exploration in lapsed 10(A) 2(B) mining lease areas vide letter no. Tech/1848/2023/3938, dated 22/12/2023.

1.1.8 Considering the request of DGM, Maharashtra, available data, field visit by MECL geologists and demand of manganese ore, MECL has proposed Reconnaissance Survey (G-4) exploration in Dhavalapur Block to fulfil the demand of manganese in the country.

1.2.0 Background:

1.2.1 In view of the enactment of the MMDR Amendment Act, 2015 and Mineral Auction Rule, 2015 by the Govt. of India, the State administration of Maharashtra desired that some mineral prospects of the State be explored on priority basis through National Mineral Exploration Trust (NMET) fund so that those could be auctioned and thereby earn revenue for the state along with the augmentation of reserve and resource of the country. Manganese occurrence areas in Nagpur district of Maharashtra are among them.

1.2.2 The Dhavalapur Manganese block is lapsed lease area by State Government of Maharashtra, which was granted as per section 10(A) 2(B) of the MMDR Act-15. The block was granted to Shri Amol B. Nagpure during 24/09/2004 to 23/09/2006 for 2 years. The Directorate of Geology and Mining (DGM), Government of Maharashtra, Nagpur requested to MECL to take up the exploration in lapsed 10(A) 2(B) mining lease areas vide letter no. Tech/1848/2023/3938, dated 22/12/2023.

1.2.3 Shri Amol B. Nagpure has carried out the prospecting in the area involving 5 pits and 2 trenches. They have analysed 7 no. of samples for manganese mineralisation in which MnO_2 ranges from 23.99 to 35.87% and Mn from 15.16 to 22.66. They have estimated 0.9 million tonnes manganese ore resources and mined out 200 tonnes of manganese ore with 25 to 30% MnO_2.

1.2.4 MECL studied the data provided by the DGM, Maharashtra and carried out the field visit in and around the Dhavalapur area. The geologist team studied the area and observed the surface indication of the manganese mineralisation in block area.

1.2.5 Based on the request of DGM, Maharashtra, available data, field visit by MECL geologists and demand of manganese ore, MECL has proposed Reconnaissance Survey (G-4) exploration in Dhavalapur Block.

1.3.0 Location& Accessibility of the Area

The proposed exploration block is located in Parseoni Tehsil of Nagpur district and about 70 km in north of district headquarter Nagpur and about 30 km from tehsil headquarter Parseoni. The area falls under the parts of Survey of India Toposheet No 55O/2 and is bounded by latitude 21º 31' 21.32" N to 21º 33' 33.48" N and longitude 79° 05' 12.51" E to 79° 09' 04.05" E (Plate No I).

The coordinate of cardinal points of block boundary are as follows:

BOUNDARY POINTS	LATITUDE	LONGITUDE
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The block area is well connected to district headquarter Nagpur, by all weather metalled road from the NH-07NH-47/SH-247 via Parseoni. The nearest railhead is Nagpur (about 70 km) and nearest railway station is Koradih Railway Station (about 30 km). The nearest airport is Dr. Babasaheb Ambedkar International Airport, Nagpur (about 75 km).

1.4.0 Physiography, Drainage, Climate and Vegetation

1.4.1 The proposed block area covered under undulating terrain (hilly as well as flat terrain) with a gentle easterly slope. The hillocks are covered with forest and the flat area belongs to agriculture land. The average elevation ranges from 340m to 470 m above MSL with knolls and hillocks. The general slope of the country is towards east and the drainage is collected by southerly flowing Pench River. The Pench River lies towards east of the proposed block.

1.4.2 The area experiences moderately dry and wet climate. The temperature rises from March onwards, reaching maximum up to 45°C during April-May. The winter sets from November and lasts upto February. Winter is moderate, temperature dropping below 10°C with occasional colder days. The monsoon sets in July and continues up to September, most of the rainfall occurs during the months of July and August. The annual rainfall is about 100 cm.

1.4.3 The area has a varied assemblage of flora and fauna owing to diversity of physical features. The prominent forest trees are Teak/Sagwan (Teconagrandis), Mahua (Madhucalongifolia), Babul (Acacia arabica), Bamboos (Bambusabambos), Tendu (Diospyrosexsculpta) trees and variety of shrubs. Wildlife in the area include wild boar (Suscristatus), panther (FelisPardus), antelopes, deer (Cervusduvancelli), fox, wolf, monkeys, hare (Lepusreficaudatus) and both poisonous and non-poisonous snakes.Birds like myna, parrot, sparrow, cuckoo, and owl are seen in the area.

1.5.0 Previous Work

1.5.1 The earliest mention of manganese ore is by Jenkin (1833) and Voysey (1833) dealing with the geology and mineralogy of the Nagpur area, Central provinces.

1.5.2 Dutta (Fermor 1909) discovered several manganese ore deposit in Bhandara district. Fremor (1909) was the first to describe in detail the deposits in the entire manganese belt in his memoir, “The manganese ore deposits of India".

1.5.3 The area witnessed mining activity from the beginning of the 18 th century. The activity was at the peak during world war-II period. Further, the mining has been at its lowest ebb or came to an almost standstill during peace time and the prospects were abandoned

possibly due to impoverishment in grade, sharp decline in prices and shallow depth persistence.

1.5.4 Fermor (1909) Dunn (1936) Basu 1964) Deshpande (1960) Roy (1961) 66, 68)D. J. Dasgupta et al (1984) Pal and Bhowmik (1995) and others have discussed themineralogical and para genetic aspect of Manganese ore and Gondite (Gondite is a rock aggregate of manganese bearing minerals along with quartz and garnets).

1.5.5 Among the Private entrepreneurs who have worked in the manganese belt includes M/s Shanti Narang, M/s. Khemka Brothers and Shri C.K. Ram Choudhary who quarried the ore in Ramtek Mahuli-Junewani area which is nearby to the block.

1.5.6 Meshram et al. (2001) have studied and assessed manganese ore in Gugaldoh block in Ramtek tehsil.

1.5.7 MOIL has done exploration in this manganese belt in its lease area. MOIL has many underground and open cast mines of manganese are present in the nearby area.

1.5.8 Shri Amol B. Nagpure has carried out the prospecting in the area involving 5 pits and 2 trenches. They have analysed 7 no. of samples for manganese mineralisation in which MnO_2 ranges from 23.99 to 35.87% and Mn from 15.16 to 22.66. They have estimated 0.9 million tonnes manganese ore resources and mined out 200 tonnes of manganese ore with 25 to 30% MnO_2.

1.6.0 Regional Geology

1.6.1 The area belongs to Mansar Formation of Sausar Group, which is a part of Sausar Supracrustal Belt. The Sausar Fold Belt (SFB), an important mesoproterozoic fold belt with southern convexity on the southern margin of the Central Indian Tectonic Zone (CITZ) trends E-W to ENE-WSWwith about 20 to 40 km wide and 300 to 350km long. The Sausar Fold Belt (SFB) comprises of two major lithotectonic assemblages, viz. Tirodi Biotite Gneiss (TBG) and metasedimentary Sausar Group (Figure-1).

1.6.2 The Sausar Group of rocks constitute as important constituent of CITZ lying in the Central Indian Peninsular Shield at the southern fringe of Satpura Province comprises a lithotectonic assemblage of strongly folded and metamorphosed non volcanic psamo-pelitic and chemogenic manganese rich matasedimentary package lying over Tirodi Biotite Gneiss with a tectonised contact. A Large-scale southerly vergent recumbent fold causes possible reversal of stratigraphic sequence due to which Sausar stratigraphy has remained problematic on various counts (Khan et al. 2002).

1.6.3 The Sausar Group is divided into four Formations in ascending order i.e, the Lohangi Formation, Mansar Formation, Chorbahuli Formation and Bichua Formations (Khan et

al., 2002). The litho units such as quartzite, quartz-mica schist, calc-silicate, calcitic and dolomitic marble and manganese/ gondite ore are present in Sausar Group. The Tirodi Biotite Gneiss (TBG) forms the basement for Sausar Group. The entire Sausar Fold Belt (SFB) is intensely deformed and has undergone upper amphibolite to granulite facies of metamorphism. The granite, pegmatite and quartz veins also occur as intrusives within Sausar Group of rocks.

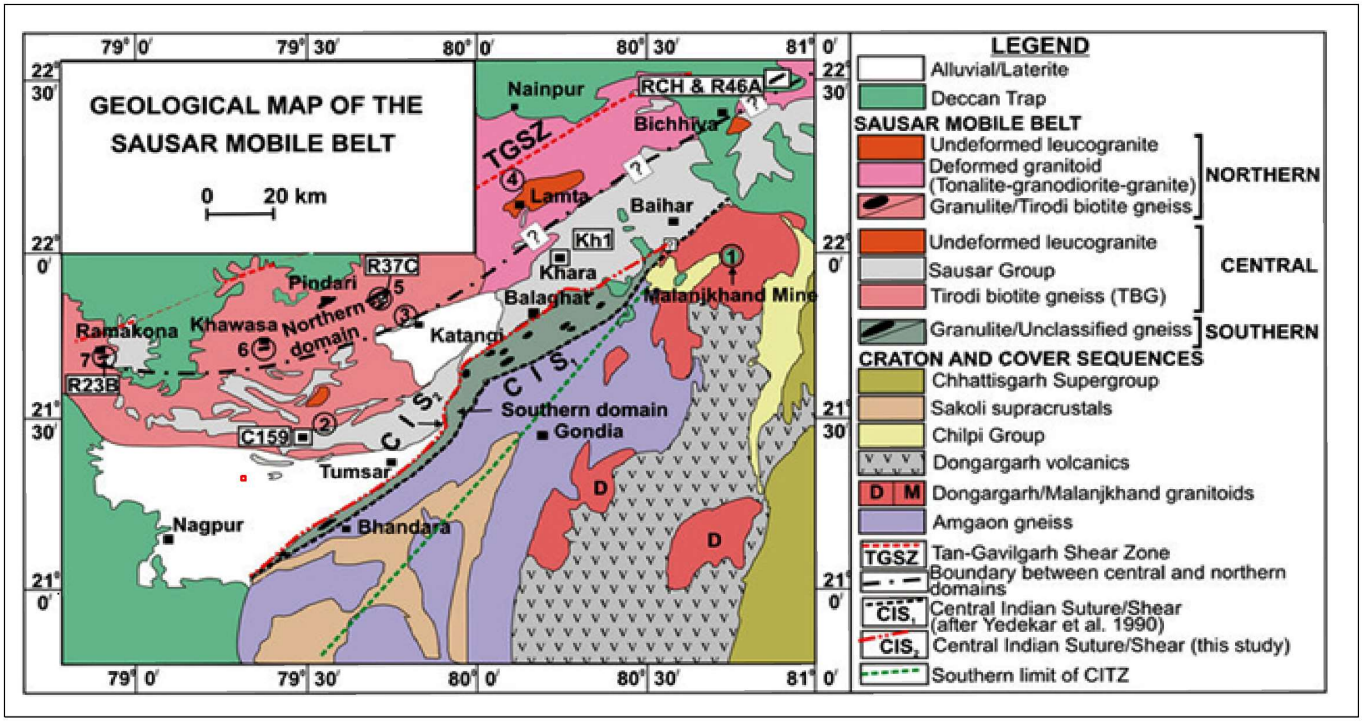


Figure-1: Geological Map of the Sausar Mobile Belt (After Bhowmik et al. 2012)

1.6.4 The Sausar Group of rocks is known for hosting syn-sedimentary strata bound and stratiform manganese deposits. The manganese ore in this area is associated with the psammo-peliticschists of Mansar Formation. Some pocket manganese occurrences are also associated with calc silicate and dolomite of Lohangi Formation.

1.6.5 The stratigraphic succession proposed for the Sausar Mobile Belt is uncertain to some extent due to absence of any basement-cover relationship and structural and metamorphic complexities. Narayanswami et.al, considered Tirodi gneiss as the basement of the Sausar Group. The contact between Tirodi gneiss and the Sausar Group is mostly tectonised at most places. Recently polymictic conglomerate has been reported at the contact of Tirodi gneiss and the Sausar Group from the locality of Mansar (Mohanty 1993) conforming that Tirodi gneiss is the basement of the Sausar Group. Recent workers (Pal and Bhowmik, 1998; Khan et al., 2000 and Chatopadhyay et al., 2001) on the basis of structural evidences have argued that the TBG is a complex medley of different type of

gneisses i.e. biotite gneiss, granite gneiss, migmatite gneiss and patches of older supracrustals forming the crystalline basement.

1.6.5 However, the latest stratigraphy of the area as proposed by Khan et al. (2002) is given in below.

Regional Litho-Stratigraphic Succession (after Khan et al, 2002)

Age	Stratigraphy	Formation	Lithology
	Recent		Alluvium and soil
	Quaternary		Laterite
Meso-proterozoic	Sausar Group	Intrusives	Massive potassic granite, pegmatite, aplite and quartz veins Foliated potassic granite, occasionally rich in biotite and/or fibrolite
		Bichhua Formation	Pure and impure dolomitic marble with subordinate red, yellow and grey chert
		Chorbahuli Formation	Coarse grained, garnetiferous quartz mica schist with local development of magnetite and staurolite: Micaceous and/or cherty ferruginous quartzite and meta-arkose with local development of magnetite and/or garnet
		Mansar Formation	Biotite (± fibrolite) - muscovite-quartz schist with thin bands of quartzite and dolomitic marble and thick horizons of Mn- ore and gondite.
		Lohangi Formation	Calc silicate rocks, calc-gneiss with subordinate pink calcitic marble and minor Mn ore horizons.
		Sitasaongi Formation	Coglomerate, quartzite, quartz mica schist
----------Tectonised Contact----------			
Archaean	Pre- Sausar Basement	Tirodi biotite gneiss (TBG)	Multicomponent gneiss e.g. biotite gneiss, migmatite gneiss, quartzo-feldspathic gneiss, felsic gneiss, tonalite-gneiss, cordierite-gneiss etc with small metabasic and mafic granulite enclaves; often highly deformed and converted to biotite-fibrolite-schist

1.6.5 Geology of the block area

The rock type of the block area mainly belongs to Mansar formation of Mesoproterozoic Sausar Group of rocks. The manganese bearing gondites are exposed in the nallah as well as pits and trenches excavated in the area. The manganese ore body is generally banded braunite quartzite rock consisting alternating layers of manganese oxides and dark manganiferous quartzite or chert. Manganiferous micaschists are also present at places.

The ore body grade laterally along the strike as well as across the strike into quartzite-spessartite-rhodonite bearing gondite.

The general geology sequence and lithology of the pearl granted area as observed has been given below.

Soil/ Alluvium

Micaceous Schist with Pegmatite

Gondite with Manganese ore

Calcareous Schist with Quartzite

Soil: it is formed due to decomposition of schists and is brown in colour. Average thickness of overburden is around 2 to 3 m.

Micaceous Schist: These are country of rocks and found to occur all over the area below soil. This formation is criss-crossed with pegmatite veins of different thickness.

Gondite with Manganese ore: The lithounit is dark grey to black, fine to medium grainedrocks containing porphyroblasts of garnet. It is syngenetic and stratabound, essentially composed of manganese bearing minerals like rhodonite, rhodocrosite, along with quartz, garnet and manganese bearing amphibole like cummingtonite, pyrolusite, hollandite etc.

Calcareous Schist with Quartzite: This formation is found to be decomposed and mainly occurs as grayish white in colour and schistose structure.

1.6.6 Regional Structure

The rocks of the Sausar Group show poly-phase deformation and metamorphism. The folds are generally overturned towards north with axial planes dipping steeply (60° - 80°) to the south along the southern part of the belt. The regional structure of the Sausar Group is divisible into four belts (Narayanswamy et. al 1963).

a) Southern belt of overturned isoclinal folding.

b) Northern belt of recumbent folds, thrust blocks and nappes.

c) Central belt of gneissic formations with narrow folded schists.

d) Regions of cross folding and refolding.

The general trend of manganese ore bodies in the block area is E-W with southerly dip.

1.6.7 Metamorphism

The entire Sausar Fold Belt (SFB) is intensely deformed and has undergone upper amphibolite to granulite facies of metamorphism. The granite, pegmatite and quartz veins also occur as intrusives within Sausar Group of rocks.

1.6.8 Mineralization (Surface manifestation)

Sausar Group is well known for the manganese ore deposits, mainly within the Mansar Formation, hosting the syngenetic strata bound mineralisation. Around the area a number of working underground and open cast mines of Manganese Ore India Limited (MOIL) are present i.e. Kandri-Khadan, Mansar-khadan etc. The manganese ore horizon is composed of interbanded manganese ore minerals or layer of gondite. Gondite occurs as massive as well as banded and composed of mainly quartz, spessartite and rhodonite with some manganese amphibole (cummingtonite).

The E-W trending ore bodies dips southerly in the block area and grade laterally along the strike as well as across the strike into quartzite-spessartite-rhodonite bearing gondite. The manganese ore bodies are encountered in the pits and trenches.

1.7.0 Scope of Proposed Exploration

1.7.1 The proposed Reconnaissance Survey (G-4 stage) program comprises topographical survey (1:12,500 scale), geological mapping (1:12,500 scale), trenching and drilling of about 500m with associated survey, chemical analysis& physical analysis and geological report preparation.

1.8.0 Observation and Recommendations of previous work

1.8.1 Shri Amol B. Nagpure has carried out the prospecting in the area involving 5 pits and 2 trenches. They have analysed 7 no. of samples for manganese mineralisation in which MnO_2 ranges from 23.99 to 35.87% and Mn from 15.16 to 22.66. They have estimated 0.9 million tonnes manganese ore resources and mined out 200 tonnes of manganese ore with 25 to 30% MnO_2.

2.0.0 Previous Work / Background information

2.0.1 The background information and previous works have been described in para 1.2.0 and 1.5.0 respectively.

3.0.0 Block description

3.0.1 The proposed block details are given in para 1.3.0.

4.0.0 Objective of the proposed Reconnaissance Survey (G4):

4.1.0 Based on the geological data of 10(A) 2(B) cases, provided by DGM, Maharashtra and field visit by MECL geologist in and around Dhavalapur Block, Dist- Nagpur, Maharashtra, the present exploration programme for Reconnaissance Survey (G-4) has been formulated.

4.2.0 The objectives of the present Reconnaissance Survey (G-4) are as follows:

i) To carry out Geological & Structural mapping on 1:12,500 scale for identification of manganese bearing formation (host rock) with the structural features to identify the surface manifestation and lateral disposition of the mineralized zones.

ii) To demarcate concealed manganese ore body by carrying out surface geophysical survey (S.P. and Magnetic) after completion of geological mapping.

iii) To carry out trenching/pitting to expose manganese ore body under soil & lateritic cover.

iv) To drill scout boreholes to prove the existence and establish persistence of manganese ore body over a promising strike length.

v) To estimate reconnaissance (334) resource of manganese ore in the block as per UNFC norms & Minerals (Evidence of Mineral Contents) Rules- 2021.

5.0.0 Planned Methodology

5.1.0 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.

5.2.0 Geological Mapping:

5.2.1 Geological mapping on 1:12,500 scale will be carried out in the entire block area. The rock types, their contact, structural features, mineralisations etc. will be mapped by taking traverses and will be marked on the map. Surface manifestations of the mineralisation available along with their surface disposition will also be marked on the map.

5.3.0 Geochemical Sampling

5.3.1 Surface sampling (Bed Rock /Channel):

During the course of Geochemical Sampling the bed rock / channel samples shall be collected from the outcrops along with soil and stream sediment samples. A total of 50 no of primary and 5 no of external check channel samples will be analyzed for manganese mineralization i.e. Mn, SiO_2, P_2O_5 Fe_2O_3, MnO_2 and Acid Insolubles.

5.4.0 Geophysical Survey:

5.4.1 The rock type of the proposed block area mainly belongs to Mansar formation of Mesoproterozoic Sausar Group of rocks. The manganese ore horizon is composed of interbanded manganese ore minerals or layer of gondite. Gondite occurs as massive as

well as banded and composed of mainly quartz, spessartite and rhodonite with some manganese amphibole (cummingtonite), braunite, pyrolusite etc.

5.4.2 Physical properties of Manganese ore and expected host rocks are given in table below.

Ore/ rock	Chemical composition	Mn content	Density (g/cc)	Magnetic Susceptibility. 0-CGS
Pyrolusite	MnO_2	63%	4.70-5.00	Paramagnetic
Psilomelane	$MnOMn_2OH_2O$		3.70-4.70	
Braunite	$Mn_2O_3Mn_6O_2$	64.3%	4.75-4.82	
Rhodonite	$MnSiO_3$	41.8%	3.40-3.6	Paramagnetic
Rhodochrosite	$MnCO_3$	47.8%	3.40-3.60	100
Jacobsite	$MnFe_2O_4$		4.95	200-300
Quartz	SiO^2		2.6-2.8	.00063
Mica	$K(Mg,Fe)_3AlSi_3O_{10}(F,OH)_2$ / $KAl_2(F,OH)_2$		2.15	

5.4.3 On the basis of above properties, Integrated Geophysical Surveys i.e., Self Potential (S.P) and Magnetic have been planned to carry out in the potential area marked by geological mapping. A total of 20.00 L.km of Self Potential (S.P) and Magnetic Surveys will be covered in the block. The Approximate time period to conduct the survey will be around 2 months.

5.5.0 Exploratory Mining (Trenching / Pitting):

5.5.1 During the exploration, shallow trenching/ pitting (excavation) work will be carried out by cutting trenches of 1m width and 2 m depth and by pitting 1m width and 2 m depth directly on the fresh outcrop/rock exposures across the manganese bearing formations involving 150 cubic meter excavation. A provision of 75 no of trench/pit samples (channel samples) for manganese mineralization has been kept. The trench walls will be mapped on 1:200 scale.

5.5.2 Around 10% of Primary samples (8 numbers) will be sent to NABL External Labs for analysis of manganese mineralization (Mn, SiO2, P2O5 Fe2O3, MnO2 and Acid Insolubles) as external check samples.

5.6.0 Exploratory Drilling:

5.6.1 Based on Geological Mapping, Geophysical Survey and Trenching/ Pitting, the extension of the mineralized zones will be marked. To confirm the potentiality of mineralized zones in strike & dip direction, approximately 500.00 m of drillingwill be carried out for upper (first) level of intersection of mineralized zones. The azimuth and angle of inclination of the proposed boreholes will be decided by the field geologist once the attitude (strike & dip) of mineralized zones (host rock) is deciphered after geological mapping and trenching/pitting.

5.7.0 Drill Core Logging

5.7.1 The borehole cores would be logged systematically; viz. details of the litho units, colour, structural feature, texture, mineralization, besides the recovery, rock quality designation (RQD) and manganese ore type would be recorded.

5.8.0 Drill Core Sampling

5.8.1 The mineralized 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 characters such as intensity of mineralization, change in lithology and core recovery etc. The primary core samples will be analysed for 6 radicals i.e. Mn, SiO_2, P_2O_5 Fe_2O_3, MnO_2 and Acid insolubles.

a) A total of 100 no of primary core samples will be analysed for 6 radicals i.e., Mn, SiO_2, P_2O_5 Fe_2O_3, MnO_2 and Acid Insolubles.

b) Around 10% of Primary samples (10 numbers) will be sent to NABL External Labs for analysis of 6 radicals i.e., Mn, SiO_2, P_2O_5 Fe_2O_3, MnO_2 and Acid Insolubles as external check samples.

5.9.0 Whole Rock Analysis:

5.9.1 Whole Rock analysis for SiO_2, Al_2O_3, Fe_2O_3, TiO_2, MnO, CaO, Na_2O, K_2O+H_2O, MgO, P_2O_5, CO_2, & S radicals will be carried out on10nos of samples to check the rock types, their variation in chemical composition.

5.10.0 Petrological and Mineragraphic Studies

5.10.1 Thin and polished section studies on drill cores samples would be done for ascertaining the petrographic and mineragraphic characteristics. These samples would be drawn from ore zones and host rocks. A provision of 10 specimens for petrographic and 10 specimens for mineragraphic studies has been kept in the block.

5.11.0 Specific Gravity Study

5.11.1 A provision of 5 samples for specific gravity determination has been kept.

5.12.0 Quantum of work:

5.13.1 The quantum of work proposed by MECL in Dhavalapur Manganese (G-4) Block is given in Table-5.1.

Table-5.1: Proposed Quantum of Exploratory Work in Dhavalapur Manganese Block, District-Nagpur, Maharashtra.

Sl. No.	Item of Work	Unit	Proposed Quantum of work
1	Geological Mapping (1:12,500)	sq. km	15.0
2	Geophysical Work		
	i) Self Potential (S.P) and Magnetic Survey	Line Km	20.00
3	Exploratory Mining (Trenching/Pitting) (1m x 2m x50m)	Cu. m	150
4	Core Drilling	m.	500
5	Sample Preparation & Chemical Analysis		
A.	Bedrock/Channel Samples		
	i) Primary samples for 6 radicals i.e. Mn, SiO_2, P_2O_5, Fe_2O_3, MnO_2 and Insolubles	Nos.	50
	ii) External Check sample (10% of Primary samples) for 6 radicals	Nos.	5
B.	Trench / Pit Samples		
	i) Primary samples for 6 radicals i.e. Mn, SiO_2, P_2O_5, Fe_2O_3, MnO_2 and Insolubles	Nos.	75
	ii) External Check sample (10% of Primary samples) for 6 radicals	Nos.	8
B.	Borehole Core Samples		
	i) Primary samples for 6 radicals i.e. Mn, SiO_2, P_2O_5, Fe_2O_3, MnO_2 and Insolubles	Nos.	100
	ii) External Check sample (10% of Primary samples) for 6 radicals	Nos.	10
6	Whole rock analysis	Nos.	10
7	Petrographic Studies	Nos	10
8	Mineragraphic Studies	Nos	10
9	Specific Gravity Studies	Nos	5
10	Report Preparation (Digital format)	Nos.	1

6.0.0 Manpower Deployment

6.0.1 Manpower deployment List may be provided later.

7.0.0 Break-up of Expenditure

7.1.0 The proposed exploration programme is planned for Reconnaissance Survey (G-4). The work activities like camp setting, geological work, survey work, drilling & laboratory work, report writing will be completed within 14 months' time. The bar chart showing activities wise time schedule is placed at **Table-7.1.**

7.2.0 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 and the total estimated cost is **Rs. 179.83 Lakh.** The summary of tentative cost estimates for Reconnaissance Survey is given in **Table No.-7.2** and details of tentative cost estimates are given as Annexure-I**.**

Estimated time schedule for Reconnaissance Survey (G-4) for Manganese in Dhavalapur Block, Districts: Nagpur, Maharashtra [Block area-15.0 sq. km; Schedule timeline- 14 months]																			
S. No.	**Particulars**	**Months**	**1**	**2**	**3**	**4**	**5**		**6**	**7**	**8**		**9**	**10**	**11**	**12**	**13**	**14**	
1	Camp Setting	Months																	1 month
2	Survey Party days (1 Party)	days																	60 Days
3	Trenching / Pitting	cu.m																	150 cu. m.
4	Drilling (1 rig)	m																	500m
5	Geologist Party days (1 Party)	days																	150 Days
6	Sampling days for Bedrock, Trench & Core Sampling (1 Party)	days						Review				Review							35 Days
7	Camp winding	Months																	1 month
8	Laboratory Studies	days																	6 months (283 samples)
9	Geologist days, HQ	days																	60 days
10	Report Writing with Peer Review	days																	4 months

Table No-7.2: Summary of Tentative Cost Estimates for Reconnaissance Survey (G-4)

Sl. No.	**Item**	**Total**
1	Geological Work	28,98,600
2	Geophysical Survey	26,99,527
3	Pitting & Trenching	4,99,500
4	Drilling	72,04,000
5	Laboratory Studies	9,13,313
6	**Sub total**	**1,42,14,940**
7	Report	7,10,747
8	Peer Review	30,000
9	Proposal Prepration	2,84,298.79
10	**Total**	**1,52,39,985**
11	GST (18%)	27,43,197.35
Total cost including 18% GST		**1,79,83,183**
SAY, in Lakhs		**179.83**

8. 0.0 Justification:

i) The Dhavalapur Manganese block is lapsed lease area by State Government of Maharashtra, which was granted as per section 10(A) 2(B) of the MMDR Act-15. The block was granted to Shri Amol B. Nagpure during 24/09/2004 to 23/09/2006 for 2 years.

ii) The Directorate of Geology and Mining (DGM), Government of Maharashtra, Nagpur requested MECL to take up the exploration in lapsed 10(A) 2(B) mining lease areas vide letter no. Tech/1848/2023/3938, dated 22/12/2023.

iii) Shri Amol B. Nagpure has carried out the prospecting in the area involving 5 pits and 2 trenches. They have analysed 7 no. of samples for manganese mineralisation in which MnO_2 ranges from 23.99 to 35.87% and Mn from 15.16 to 22.66. They have estimated 0.9 million tonnes manganese ore resources and mined out 200 tonnes of manganese ore with 25 to 30% MnO_2.

iv) MECL studied the data provided by the DGM, Maharashtra and carried out the field visit in and around the Dhavalapur area. The geologist team studied the area and observed the surface indication of the manganese mineralisation in block area. They have also collected 4 nos. of samples for which analyses are awaited.

v) Thus the manganese mineralisation in the area is confirmed both by previous data and the field visit by MECL geologists.

vi) The manganese ore is the basic source to provide manganese as indispensable input in making of iron and all types of steels and so far there is no technology which can substitute manganese in steel making. Manganese is also categorised as notified mineral under Fourth Schedule of MMDR Amendment Act-2015, which prospecting and exploration is needed before auction.

vii) Considering the request of DGM, Maharashtra, available data, field visit by MECL geologists and demand of manganese ore, MECL has planned to carry out exploration in the Dhavalapur Block and proposed Reconnaissance Survey (G-4) exploration in block to fulfil the demand of manganese in the country.

9. 0.0 References:

Dasgupta, D.J. et al. (1984): Genesis and petrography of manganese ores of central India IGCP III, GSI, unpublished reports pp: 53.

Dunn, J.A. (1936): A study of some microscopical aspects of Indian manganese ores, Trans. Nat. Inst. Sc. India Vol. 1 pp: 103-124.

Fermer, L,L., 1909: The manganese ore deposit of India .Mem. Geol. Surv. Ind.Vol.37

Jenekins F. –1833: An account of some mineral collected at Nagpur and itsvicinity with remark on geology of part of the country Asiatic researcher volume 18 Part I page 195-250

Khan, A.S., Huin, A. K. and Chattopadhyay, A., 2002.:Final report on SpecialisedThematic Mapping in the Sausar Fold Belt in Manegaon – Deolapar – Ramtek area, Nagpur and Bhandara districts, Maharashtra for elucidation of stratigraphy, structure, metamorphic history and tectonics.Unpubl. G.S.I., Rep. for F.S. 1996-99.

Khan, A.S., Dawande A. K., Chattopadhyay, A. and Singhai, R.K. (2005): Progress Report On Specialised Thematic Mapping In Sausar Fold Belt In GoreghatLendejhari Area, Balaghat District, Madhya Pradesh And Bhandara District, Maharashtra (Parts Of Toposheets No. 55 O/10 & 11)

Meshram, S. N., 1998: Final report on the investigation for manganese ores in parsoda, Ramtek tehsil, Nagpur district, Maharashtra. Unpubl. GSI Rep. for F.S.1996-98.

Nagpure, Amol B. (2006): Report of prospecting operations carried out for prospecting liscence granted to Shri Amol B. Nagpure, at village Dhavalapur, Tahsil- Parseoni, District-Nagpur, Maharashtra.

Pal, Taraknath (1995): GSI unpublished reports F.S. 1994-95.

Voysey H W (1833): On the geological and mineralogical structure of the hills of Sitabuldi Nagpur and its immediate vicinity, Asiatic Researches vol 18 p-103.

Nagpure, Amol B. (2006): Report of prospecting operations carried out for prospecting liscence granted to Shri Amol B. Nagpure, at village Dhavalapur, Tahsil- Parseoni, District-Nagpur, Maharashtra.

List of Plates:

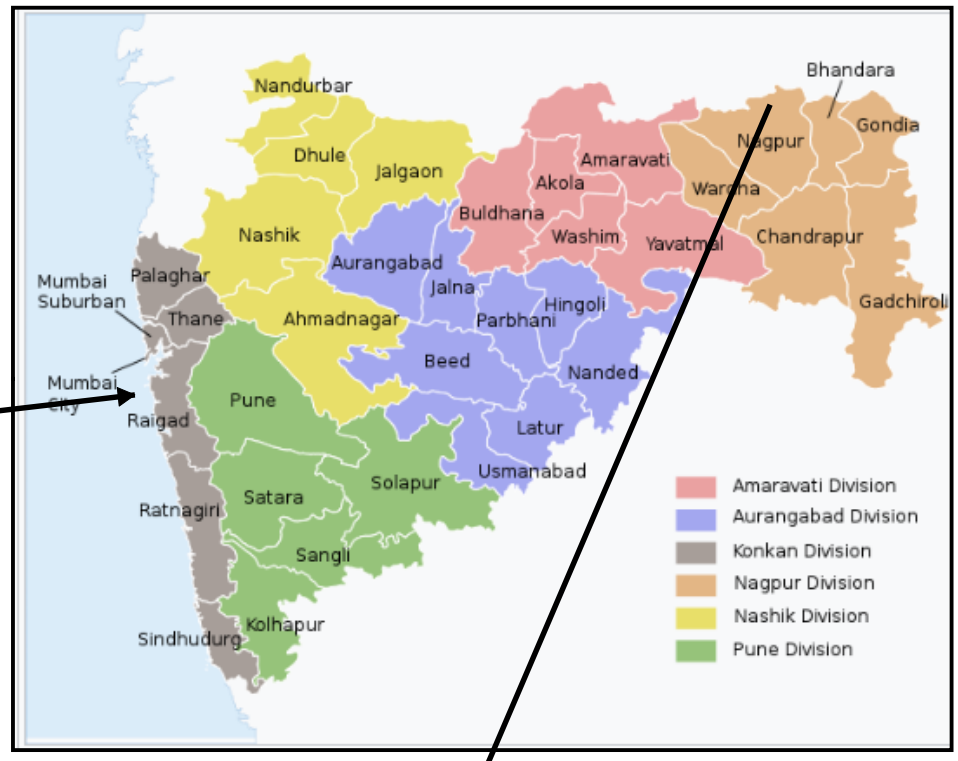
1. Plate-I: Block Location Map of Dhavalapur Block in Toposheet no. 55O/02, District-Nagpur, Maharashtra.
2. Plate-II: Regional Geological Map of the area (Scale 1: 50,000).

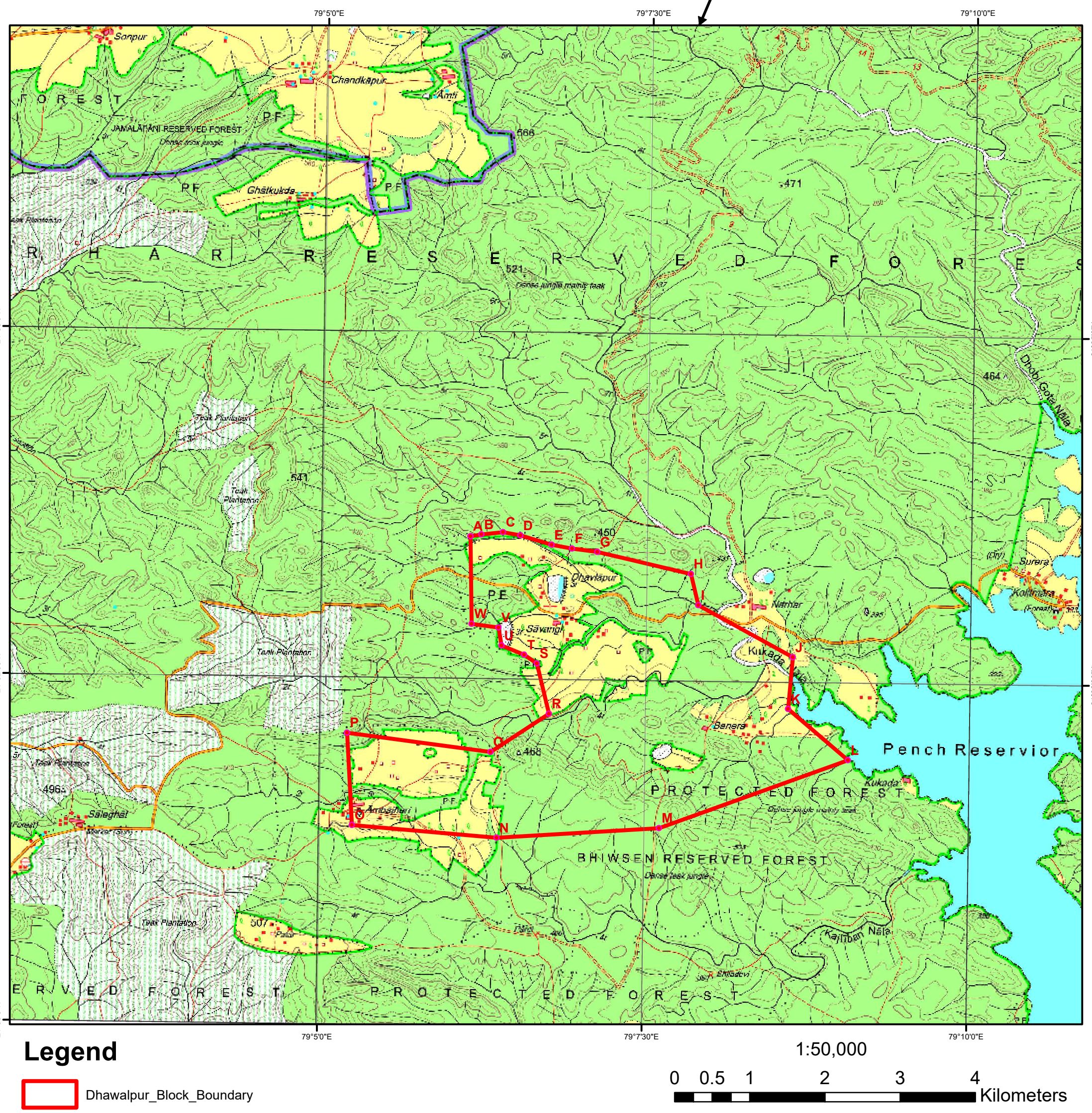
List of Annexures:

1. **Annexure-I:** Details of the total cost estimatedfor the Reconnaissance Survey (G-4) in Dhavalapur Block, District-Nagpur, Maharashtra.

Estimated cost for Reconnaissance Survey (G-4) for Manganese in Dhavalapur Block, Districts: Nagpur, Maharashtra [Block area-15.0 sq. km; 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 -Sl No.	Rates as per SoC	Qty.	Amount (Rs)	
A	**GEOLOGICAL WORK**						
1	**Borehole logging, sampling & Report writing**						
i	Charges for one Geologist- Field	day	1.2	11,000	150	16,50,000	
ii	Charges for one Geologist per- HQ	day	1.2	9,000	60	5,40,000	
iii	2 labours/ party (Rs 504/day/labour) (As per rates of Central Labour Commissioner)	day	5.7	504	300	1,51,200	Amount will be reimburse as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher
iv	Trench and Core Sampling -1 Samplers Labour charge not included	day	1.5.2	5,100	35	1,78,500	
v	4 labours/ party for smpling (Rs 504/day/labour) (As per rates of Central Labour Commissioner)	day	5.7	504	140	70,560	Amount will be reimburse as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher
2	**Survey (on 1:12,500 Scale)**						
i	Bore Hole Fixation and determination of co-ordinates & Reduced Level of the boreholes by DGPS and boundary coordinates	Per Point of observation	1.6.2	19,200	8	1,53,600	8 BHs and 4 boundary coordinates one base station
ii	Charges of Surveyor	one surveyor per day	1.6.1a	8,300	15	1,24,500	
iii	Labours Charges for survey work; Base rate - Rs.504	day	5.7	504	60	30,240	Amount will be reimburse as per the notified rates for unskilled labor by the Central Labour Commissioner or respective State Govt. whichever is higher
					Sub Total- A	**28,98,600**	
B	**GEOPHYSICAL SURVEY**						
i	SP & Magnetic Method	8-20 L.Km	3.3b	12,92,047	1	12,92,047	
ii	Charges for one Geophysicist per day at field	day	3.18	11,000	60	6,60,000	
iii	Charges for Surveyor	day	1.6.1a	8,300	60	4,98,000	
iv	Labours (4 Nos)	day	5.7	477	240	1,14,480	
v	Charges for one Geophysicist per day at HQ	day	3.18	9,000	15	1,35,000	
					Sub Total- B	**26,99,527**	
C	**PITTING AND TRENCHING**						
i	Trenching (1m x 2mx 10 m) x 7 trenches	Cu m	2.1.1	3330	150	4,99,500	
					Sub Total- C	**4,99,500**	
D	**DRILLING**						
i	Drilling upto 300m (Hard Rock) (1 rigs)	m	2.2.1.4a	11,500	500	57,50,000	
ii	Borehole deviation Survey	m	2.2.6	330	500	1,65,000	
iii	Land / Crop Compansation	per BH	5.6	20,000	8	1,60,000	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	DGPS Survey for BH coordinates	per point	1.6.2	19,200	8	1,53,600	
vi	Transportation of Drill Rig & Truck associated per drill	Km	2.2.8	36	300	10,800	Certification in this regard is required to be provided
vii	Monthly Accomodation Charges for drilling Camp (up to 2 Rigs)	month	2.2.9	50,000	2	1,00,000	
viii	Drilling Camp Setting Cost	Nos	2.2.9a	2,50,000	1	2,50,000	
ix	Drilling Camp Winding up Cost	Nos	2.2.9b	2,50,000	1	2,50,000	
x	Approach Road Making (Flat Terrain)	Km	2.2.10a	22,020	5	1,10,100	Road Making will be considered as per the requirement and Road Making Charges will be reimbursed later
xi	Core Preservation: One complete borehole plus mineralised cores of all the remaining Bhs	m	5.3	1,590	150	2,38,500	This amount will be reimbursed after successful delivery of the cores to concerned libraries/authorities
					Sub Total- D	**72,04,000**	
E	**LABORATORY STUDIES**						
1	**Chemical Analysis (Primary & Check samples)**						
	a. Primary Samples for 6 radical (Mn, SiO2, P2O5, Fe2O3, MnO2 and Insolubles)	Nos	4.1.7a + 7b	2,841	225	6,39,225	Bedrock-50, Trench-75, BH-100
	b-External(10%) Check samples from NABL Lab for 6 radical (Mn, SiO2, P2O5, Fe2O3, MnO2 and Insolubles)	Nos	4.1.7a + 7b	2,841	23	63,923	
2	**Physical & Petrological Stusies**						
i	Preparation of thin section	Nos	4.3.1	2,353	10	23,530	
ii	Complete petrographic study report	Nos	4.3.4	4,232	10	42,320	
iii	Preparation of polished section	Nos	4.3.2	1,549	10	15,490	
iv	Complete mineragraphic study report	Nos	4.3.4	4,232	10	42,320	
v	Digital Photographs	Nos	4.3.7	280	10	2,800	
vi	Whole Rock Analysis (Major oxide and 8 additional trace elements)	Nos	4.1.15a & b	7,568	10	75,680	
vii	Specific gravity studies	Nos	4.8.1	1,605	5	8,025	
					Sub Total- E	**9,13,313**	
F					**Total A to E**	**1,42,14,940**	
G	**Geological Report Preparation**		**5.2**	For the projects having cost exceeding Rs. 50 lakhs but less than Rs. 150 lakhs - A minimum of Rs. 2.5 lakhs or 5% of the value of work whichever is more		**7,10,747**	Reimbursement will be made after submission of the final Geological Report in Hard Copies (5 Nos) and the soft copy to NMET.
H	**Peer review Charges**		**As per EC decision**			**30,000**	
I	**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.5 Lakhs whichever is lower		**2,84,298.79**	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.
J	**Total Estimated Cost without GST**					**1,52,39,985.27**	
K	**Provision for GST (18% of I)**					**27,43,197.35**	GST will be reimburse as per actual and as per notified prescribed rate
L	**Total Estimated Cost with GST**					**1,79,83,182.61**	
					Rs. (in lakhs)	**179.83**	
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 Certifiate regarding non outsourcing of any component/project is required.						

LOCATION MAP OF DHAVALAPUR BLOCK, DIST-NAGPUR, MAHARASHTRA





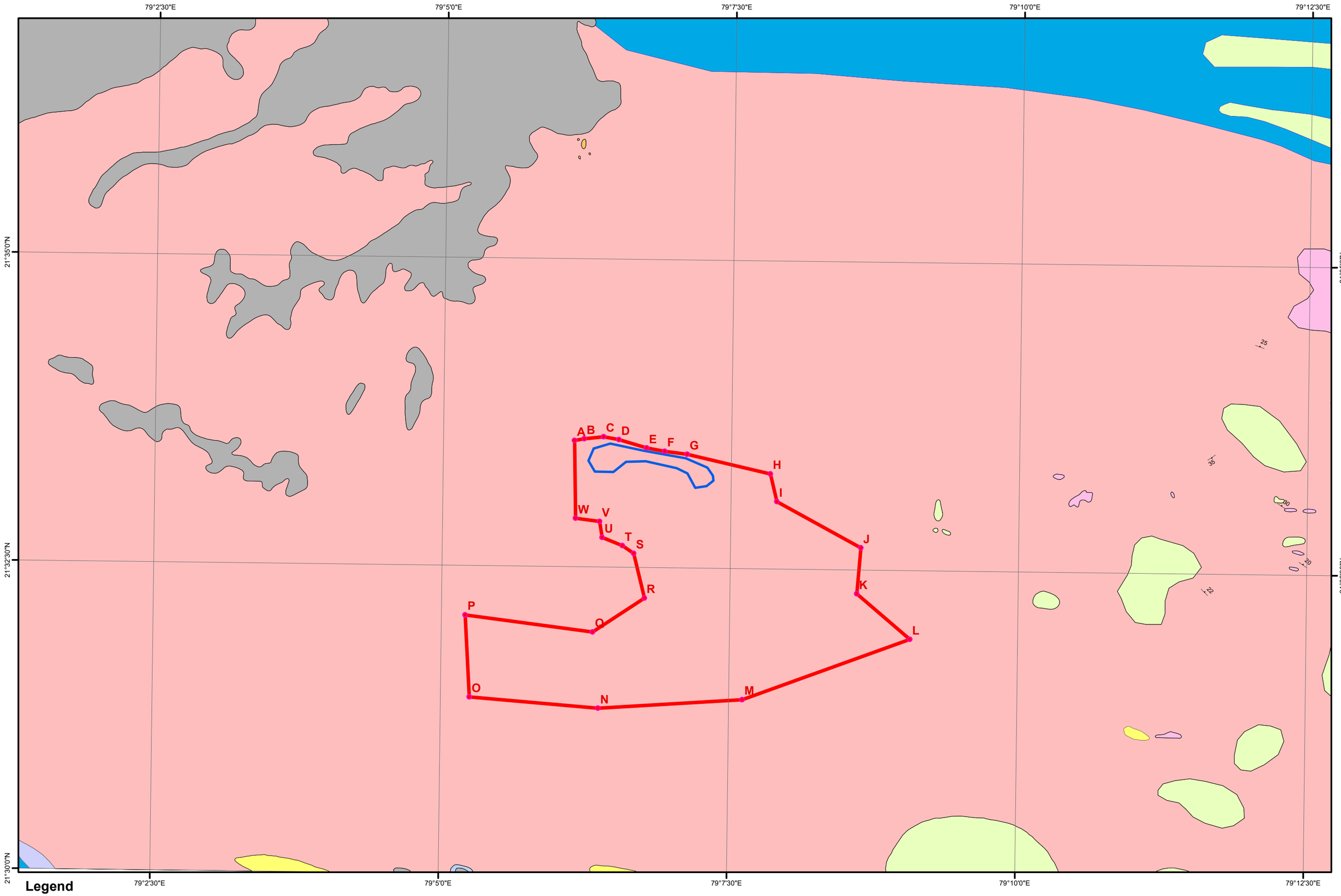
Legend

Dhawalpur_Block_Boundary

1:50,000

0 0.5 1 2 3 4 Kilometers

REGIONAL GEOLOGICAL MAP OF DHAVALAPUR BLOCK, DIST-NAGPUR, MAHARASHTRA



Legend

- PROPOSED BLOCK BOUNDARY
- Lease area
- Oriented_Structure_Plane
- BASALT
- CALC GNEISS
- GNEISS/MIGMATITE
- GRANITE
- LATERITE
- LIMESTONE
- MANGANIFEROUS MARBLE
- MARBLE
- QUARTZITE

1:50,000

0 0.5 1 2 3 4 Kilometers