PROPOSAL FOR PRELIMINARY EXPLORATION (G-3) FOR LIMESTONE IN MALKHED-1 NORTH, MALKHED-1 SOUTH, MALKHED-2 NORTH and MALKHED-2 SOUTH BLOCKS OVER AN EXTENT OF 18.02 Sq. Km., BHIMA BASIN, DISTRICT: GULBARGA (KALABURAGI), KARNATAKA

UNDER NMET PROGRAM.

COMMODITY: LIMESTONE

BY

MINERAL EXPLORATION AND CONSULTANCY LIMITED

DR. BABASAHAB AMBEDKAR BHAWAN

SEMINARY HILLS

PLACE: NAGPUR DATE: AUGUST, 2024

Summary of the Proposed Malkhed-1 North, Malkhed-1 South, Malked-2 North and Malkhed-2 South Blocks (G-3) for Limestone

Features	Details
Block ID :	Malkhed-1 North, Malkhed-1 South, Malked-2 North and Malkhed-2 South Blocks
Current Exploration Agency	**Mineral Exploration and Consultancy Ltd. (MECL)** (Formerly Mineral Exploration Corporation Ltd.)
Previous Exploration Agency	**Geological Survey of India (GSI)**
Geological Report (Previous stage Geological Report)	MECL has carried out G-3 level exploration through NMET funding and completed geological mapping and topographical survey in 1:4000 scale, 10 exploratory boreholes covering an area of 18.02 sq km has been carried out consist of 2 blocks Malkhed-1 and Malkhed-2.
Commodity	Limestone
Mineral Belt :	Bhima Basin
Budget &Time Schedule to complete the project	Rs. 143.92 Lakhs, 06 month time period
Objectives:	During the FY 2022-2023 2 Limestone Blocks Malkhed-1 and Malkhed-2 over an extent of 8.50 sq km and 9.52 sq km respectively were explored by MECL. Based on the feasibility of Limestone Blocks, State Govt. Of Karnataka has observed that the blocks are too large for auctioning hence requested MECL to make 04 smaller blocks out of 02 explored said blocks. After making 4 blocks, the present exploration does not meet the requirement of MEMC Rule for auctioning as individual block. Hence, infilling boreholes are required in each block to meet the requirement since all the other requirements of exploration have been completed in the newly carved out 04 blocks. Objectives of the proposed exploration in Malkhed-1 North, Malkhed-1 South, Malked-2 North and Malkhed-2 South Blocks are as follows: i. The objective of the present proposal is to meet the requirement for auction according to the Minerals (Evidence of Mineral Contents) Rule-2015 & Mineral (Auction) Rules-2015 (Amended upto 2021). ii. To estimate the limestone resource at Inferred Category (**333** Category) in the individual blocks.
Whether the work will be carried out by the proposed agency or through outsourcing	The work will be carried out by Mineral Exploration and Consultancy Ltd. (MECL).

and details thereof. Components to be outsourced and name of the outsource agency:	
Name/ Number of Geoscientists :	Geologist: 01 HQ (30 days) Geologist: 01 Field (60 days)
Expected Field days (Geology, Surveyor)	Geologist: 01 HQ (30 days) Geologist: 01 Field (60 days)
1. Location:	
Location	The proposed Malkhed-1 North, Malkhed-1 South, Malked-2 North and Malkhed-2 South Blocks are located in Sedam Taluk of Gulbarga district having a total block area of 18.02 Sq. Km. The proposed blocks fall in the jurisdiction of Malkhed Village, Sedam Taluk, Gulbarga (Kalaburagi) District. The block falls in the Survey of India Toposheet No. 56G/04.

Block boundary Coordinate

Point Name	Block Name	UTM Co-ordinates (Zone-43)		DMS Co-ordinates (GCS WGS-1984)		Area (Sq. Km.)
		Northing (m)	Easting (m)	Latitude	Longitude	
MWN-1	Malkhed-1 North	1902026.46	730933.54	17° 11' 29.164"N	77° 10' 16.793" E	4.09
MWN-2		1901673.97	733372.91	17° 11' 16.808"N	77° 11' 39.184"E	
MWN-3		1899842.27	732329.94	17° 10' 17.628"N	77° 11' 03.202"E	
MWN-4		1901073.94	730003.63	17° 10' 58.528"N	77° 09' 44.973"E	
MWS-1	Malkhed-1 South	1899842.27	732329.94	17° 10' 17.628"N	77° 11' 03.202"E	4.40
MWS-2		1901073.94	730003.63	17° 10' 58.528"N	77° 09' 44.973"E	
MWS-3		1898450.41	731540.21	17° 09' 32.656"N	77° 10' 35.959"E	
MWS-4		1899950.51	728906.87	17° 10' 22.392"N	77° 09' 07.449"E	
MEN-1	Malkhed-2 North	1901515.79	734745.22	17° 11' 11.158"N	77° 12' 25.547"E	4.33
MEN-2		1899937.65	738302.91	17° 10' 18.515"N	77° 14' 25.283"E	
MEN-3		1899084.40	736325.58	17° 09' 51.509"N	77° 13' 18.067"E	
MEN-4		1900805.33	734176.34	17° 10' 48.266"N	77° 12' 06.029"E	

	MES-1	South Malkhed-2	1900805.33	734176.34	17° 10' 48.266"N	77° 12' 06.029"E	5.19
	MES-2		1899084.40	736325.58	17° 09' 51.509"N	77° 13' 18.067"E	
	MES-3		1898365.84	734660.41	17° 09' 28.761"N	77° 12' 21.466"E	
	MES-4		1899609.93	732198.73	17° 10' 10.121"N	77° 10' 58.675"E	
	MES-5		1900679.35	732802.66	17° 10' 44.675"N	77° 11' 19.512"E	
	MES-6		1900162.53	733661.64	17° 10' 27.553"N	77° 11' 48.372"E	
Villages :	Malkhed, Konkanahalli						
Tehsil/ Taluk :	Sedam						
District :	Gulbarga (Kalaburagi)						
State :	Karnataka						
2. Area (hectares/ square kilometres)							
Block Area :	18.02 sq. km.						
Forest Area :	No forest area.						
Government Land Area	Data not available						
Private Land Area	The block area mostly comprises of private land						
3. Accessibility							
Nearest Rail Head :	Malkhed Road (Central Railway Zone)						
Road :	The block can be approached from the nearest taluk headquarters through single lane asphalted village roads. The state highway No. 10 passes at a distance of 500 m from the northern boundary of the block which connects Gulbarga and Sedam Taluks. No roads passes through the block.						
Airport :	The nearest airport (Kalaburagi Airport) is at 30 km from the block on Gulbarga-Sedam state highway No. 10.						
4. Hydrography							
Rivers/ Streams	The block is drained by West flowing Kagina river forms the main drainage in the area. The drainage pattern of the area is dendritic in nature. There are no perinneal rivers in the block area, however a seasonal nala flows across the central part of the block.						
5. Climate							
Mean Annual Rainfall :	The average annual rainfall is 770 - 880 mm and the relative humidity varies from 26% in summer to 62% in winter. **Rainfall: Max. 70 mm in 24 hours**						
Temperatures	**Summer: Max. 45°C in May- June** **Winter: Min. 10 °C in December**						
6. Topography							

Toposheet Number	Survey of India Toposheet No. 56G/04
	The area is generally flat and maximum area is covered by cultivated fields. The block area depicts plain with gentle slope towards North. The elevation of the area ranges from 400m to 420m above mean sea level. The general slope in the blocks is from South to North.
7. Availability of baseline geology data	
Geological Map	1. Geological Map of the Bhima Basin (cale-1:25,000),GSI Mimore-129, GSI
Geochemical Map and Geophysical Map	Geochemical Map and Geophysical Map is not available for the proposed block.
8. Justification for taking up G4 stage mineral exploration	1. During the FY 2022-2023 2 Limestone Blocks Malkhed-1 and Malkhed-2 over an extent of 8.50 sq km and 9.52 sq km respectively were explored by MECL. Based on the feasibility of Limestone Blocks, State Govt. Of Karnataka has observed that the blocks are too large for auctioning hence requested MECL to make 04 smaller blocks out of 02 explored said blocks. After making 4 blocks, the present exploration does not meet the requirement of MEMC Rule for auctioning as individual block. Hence, infilling boreholes are required in each block to meet the requirement since all the other requirements of exploration have been completed in the newly carved out 04 blocks. Hence this proposal is being put up for discussion and approval 2. Due to the high demand of limestone nine limestone blocks viz. Kannur Wadi, Hanamaneri, Bommanalli, Chitapura SW, Sulahalli, Ravur, Satanur, Diggaon, Udagi, have been successfully auctioned in the state since 2015.

PROPOSAL FOR PRELIMINARY EXPLORATION (G-3) OF LIMESTONE IN MALKHED-1 NORTH, MALKHED-1 SOUTH, MALKED-2 NORTH AND MALKHED-2 SOUTH BLOCKS, DISTRICT- GULBARGA, KARNATAKA

1.0.0 INTRODUCTION

1.1.0 Limestone is a sedimentary rock, originated mainly by chemical/ biochemical precipitation of carbonate minerals in a variety of depositional environments, ranging from marine to terrestrial. The marine system is either neritic (shelf) or pelagic (open-ocean) (James and Jones, 2016). Most of the limestone in geological history is deposited in neritic system. On the other hand, evidences show that pelagic limestones are in the operation since Jurassic time. In terrestrial setting carbonates are usually formed in lakes, springs, caves depending upon water temperature and local climate. Calcium carbonate ($CaCO_3$) in the form of calcite is the predominant mineral constituent of limestone. It also contains some amount of magnesium carbonate ($MgCO_3$) and/or dolomite ($CaMg(CO_3)_2$). Variable amount of ferruginous quartz, clay, pyrite, haematite, chert etc., present as non-carbonate minerals, control the quality/grade of limestone.

1.2.0 Limestone is primarily used to manufacture of cement. However, the uses of limestone, now a day, have not been confined only to construction material; rather the versatility in its uses in different industries made it a valuable mineral. In Iron & Steel Industry, limestone is used both in blast furnace and steel melting shop as a flux. In chemical industry, limestone is consumed to produce bleaching powder, toothpaste, calcium carbide etc. It is used as a purifier in the sugar industry. Limestone is also consumed by industries like paper, fertilizer and foundry etc.

1.3.0 The total reserves/resources of limestone of all categories and grades as per NMI database based on UNFC system as on 1.4.2020 has been estimated at 2,27,589 million tonnes, of which 19,028 million tonnes (8%) are placed under Reserves category and 208,560 million tonnes (92%) are under Remaining Resources category. Karnataka is the leading State having 24% of the total resources followed by Andhra Pradesh (13%), Rajasthan (12%), Gujarat (10%), Meghalaya (10%), Telangana (7%), Chhattisgarh (5%) and Madhya Pradesh (4%). The remaining 15% is shared by other states. Grade-wise, Cement grade (Portland) has leading share of about 68% followed by Unclassified grades (11%) and BF grade (6%).

1.4.0 India was the second largest cement producing country in the world after China. In 2019-20, the total consumption of limestone, as reported by different industries was 328.62 million tonnes registering negative growth of 0.87% over that of preceding year. Cement was the major consuming industry accounting for 308.66 million tonnes (94%) consumption, followed by iron & steel 12.68 million tonnes (4%) and

chemical5.29 million tonnes (2%). The remaining consumption was reported by aluminium, alloy steel, sugar, paper, fertilizer, glass, metallurgy, foundry, etc.

1.5.0 BACKGROUND

1.5.1 With the consent of the State Govt. and approval of 27th EC, NMET Meeting MECL explored 02 limestone blocks i.e. Malkhed-1 and Malkhed-2. Results and findings of the exploration was reported separately as two different blocks Malkhed-1 and Malkhed-2 for the ease of auction process during November 2023.

1.5.2 Based on the feasibility of Limestone Blocks, State Govt. Of Karnataka has observed that the blocks are too large for auctioning hence requested MECL to make 04 smaller blocks out of 02 explored blocks.

1.5.3 After making 4 blocks, the present exploration does not meet the requirement of MEMC Rule for auctioning as individual block. Hence, infilling boreholes are required in each block to meet the requirement since all the other requirements of exploration have been completed in the newly carved out 04 blocks.

1.5.4 In view of the above this proposal have been prepared to fill the data gap in the newly carved out blocks Malkhed-1 (North), Malkhed-1 (South), Malked-2 (North) and Malkhed-2 (South) which will be feasible for auction as Mining Lease (ML)

2.0 LOCATION AND ACCESSIBILITY

2.1 The proposed Malkhed Blocks are located in SedamTaluk of Gulbarga district having a total block area of 18.02 Sq. Km. The location of the Block is shown in **PLATE No-I.** The block can be approached from the nearest taluk headquarters through single lane asphalted village roads. The proposed blocks fall in the jurisdiction of Malkhed Village, Sedam Taluk, Gulbarga (Kalaburagi) District. The Blocks fall in the Survey of India Toposheet No. 56G/04 and is bounded by the co-ordinates as listed in the **Table-2.1**

Table-2.1

Co-ordinates of corner points of proposed Malkhed-1 and Malkhed-2 Blocks (G-3) for Limestone, District: Gulbarga (Kalaburagi), State: Karnataka.

Sl. No.	Point Name	Block Name	UTM Co-ordinates (Zone-43)		DMS Co-ordinates (GCS WGS-1984)		Area (Sq. Km.)
			Northing (m)	Easting (m)	Latitude	Longitude	
1	MWN-1	Malkhed-1 North	1902026.46	730933.54	17° 11' 29.164"N	77° 10' 16.793" E	4.09
2	MWN-2		1901673.97	733372.91	17° 11' 16.808"N	77° 11' 39.184"E	
3	MWN-3		1899842.27	732329.94	17° 10' 17.628"N	77° 11' 03.202"E	
4	MWN-4		1901073.94	730003.63	17° 10' 58.528"N	77° 09' 44.973"E	
1	MWS-1	Malkhed-1 South	1899842.27	732329.94	17° 10' 17.628"N	77° 11' 03.202"E	4.40
2	MWS-2		1901073.94	730003.63	17° 10' 58.528"N	77° 09' 44.973"E	
3	MWS-3		1898450.41	731540.21	17° 09' 32.656"N	77° 10' 35.959"E	
4	MWS-4		1899950.51	728906.87	17° 10' 22.392"N	77° 09' 07.449"E	
1	MEN-1	Malkhed-2 North	1901515.79	734745.22	17° 11' 11.158"N	77° 12' 25.547"E	4.33

Sl. No.	Point Name	Block Name	UTM Co-ordinates (Zone-43)		DMS Co-ordinates (GCS WGS-1984)		Area (Sq. Km.)
			Northing (m)	Easting (m)	Latitude	Longitude	
2	MEN-2		1899937.65	738302.91	17° 10' 18.515"N	77° 14' 25.283"E	
3	MEN-3		1899084.40	736325.58	17° 09' 51.509"N	77° 13' 18.067"E	
4	MEN-4		1900805.33	734176.34	17° 10' 48.266"N	77° 12' 06.029"E	
1	MES-1	South Malkhed-2	1900805.33	734176.34	17° 10' 48.266"N	77° 12' 06.029"E	5.19
2	MES-2		1899084.40	736325.58	17° 09' 51.509"N	77° 13' 18.067"E	
3	MES-3		1898365.84	734660.41	17° 09' 28.761"N	77° 12' 21.466"E	
4	MES-4		1899609.93	732198.73	17° 10' 10.121"N	77° 10' 58.675"E	
5	MES-5		1900679.35	732802.66	17° 10' 44.675"N	77° 11' 19.512"E	
6	MES-6		1900162.53	733661.64	17° 10' 27.553"N	77° 11' 48.372"E	

2.2 The block can be approached from the nearest taluk headquarters through single lane asphalted village roads. The state highway No. 10 passes at a distance of 500 m from the northern boundary of the block which connects Gulbarga and SedamTaluks. No roads passes through the block. The nearest airport (Kalaburagi Airport) is at 30 km from the block on Gulbarga-Sedam state highway No. 10.

2.3 The block area is surrounded by cement manufacturing industries and some of them are as follows:

- Orient Cement Plant, Itgi, Chittapur
- Ultratech Cement Plant, Malkhed
- Vasavadatta Cement plant, Sedam
- Jaypee Cement Corporation Ltd. Plant, Shahabad
- ACC, Cement, Wadi
- Shree Cement, Gulbarga

3.0 PHYSIOGRAPHY AND DRAINAGE

3.1 The area is generally flat and maximum area is covered by cultivated fields. The block area depicts plain with gentle slope towards North. The elevation of the area ranges from 400m to 420m above mean sea level. The general slope in the blocks is from South to North. The blocks are drained by West flowing Kagina river forms the main drainage in the area. There are no perennial rivers in the block area, however a seasonal nala flows across the central part of the block. The drainage pattern of the area is dendritic in nature.

4.0 CLIMATE

4.1 The climate of the area has semi-arid type climate. Dry climate prevails for most part of the year. December is the coldest month with average daily maximum and minimum temperatures being 29.5^{0}C and 10^{0}C respectively. During peak summer, temperature rises upto 45^0 C. The climatic information of the area is as given below:

Temperature **Max. 45°C in May- June**
Min. 10°C in December

The average annual rainfall is 770 - 880 mm and the relative humidity varies from 26% in summer to 62% in winter.

Rainfall **Max. 70 mm in 24 hours**

5.0 FLORA & FAUNA

5.1 No forest, sanctuaries, national park, etc., exist in the vicinity of the Block.

6.0 PREVIOUS WORK

6.1. MECL explored Malkhed-1 and Malkhed-2 Blocks during the FY 2022-23 where Geological Mapping, Topographical contouring in 1:4000 scale was carried out, and 600 m drilling in 10 exploratory boreholes were carried out. In the Malkhed-1 Block, the total inferred category resource is 843.92 million tonnes and reconnaissance category is 214.23 million tonnes by cross sectional method.

Category	Cement (Portland) Grade	Blendable Grade	Blendable/ Threshold Grade	Total	Remarks
333	562.99	17.02	263.91	843.92	79.75%
334	123.27	7.98	82.98	214.23	20.25%
Total	686.26	25.00	346.89	1058.15	100%

In the Malkhed-2 Block, the total inferred category resource is 628.89 million tonnes and reconnaissance category is 241.83 million tonnes by cross sectional method.

Category	**Cement (Portland) Grade**	**Blendable/ Threshold Grade**	**Total**	**Remarks**
333	185.45	443.43	628.89	77.23%
334	78.57	163.27	241.83	27.77%
Total	**264.02**	**606.70**	**870.72**	**100%**

6.6 East of Chittapur and North Diggaon village, MECL has carried out exploration during 2018-19 at G3 level and established 530.80 MT with average grade 45.45% CaO, 1.00% MgO,11.59% SiO2 in Diggaon Block and 385.35 MT with average grade 45.66% CaO, 0.55% MgO ,12.98% SiO2 in Udagi Block of net in-situ resource of Cement grade Limestone.

6.7 GSI had carried out G-2 exploration in Bommanalli Limestone Block and estimated a resource of B.F Grade 244.27 MMT in Avg 49.83% CaO, 9.92%SiO2, 1.16%Al2O3, Portland Cement Grade 18.921 MMT in Avg 47.42% CaO, 14.41%SiO2, 0.91%Al2O3, 154.246 MMT in Avg 41.80% CaO, 23.37%SiO2, 2.12%Al2O3 and 46.488 MMT in Avg 39.12% CaO, 27.17%SiO2, 1.65%Al2O3.

6.8 GSI had carried out G-2 exploration in Chittapur South Limestone Block and estimated a resource of Portland Cement Grade 89.04 MMT in Avg 46.39% CaO, 15.65%SiO2, 0.98%Al2O3, Beneficiable Cement Grade 228.16 MMT in Avg 39.08% CaO, 27.03%SiO2, 1.66%Al2O3.

6.09 GSI had carried out G-4 level exploration in Chitapura SW Block and Sulahalli Limestone Block, estimated a resource of 438.00 MMT of Cement Grade Limestone and 466.00 MMT of Cement Grade Limestone respectively.

6.10 The above said blocks have been successfully auctioned as Mining Leases due to high demand of Limestone in the area.

7.0 REGIONAL GEOLOGY AND STRUCTURE

7.1. Bhima basin is the smallest of all Proterozoic basins of India. They do not actually come in contact with the Kaladgi group and are believed to be younger.They are in close resemblance to the Kurnool group of the Cuddapah super group. The Bhima basin is covered by latitude N 16°20' to 17°35' and longitude N 76°15' to 77°40'E. The Bhima basin sediments stretch linearly in N -S for about 160 km with varying width and the maximum being 40 km. It extends over an area of 5200 Sq.km. and is situated to the North-west of Cuddapah basin and North east of Kaladgi basin.

7.2 Captain New Bold (1842 – 1845) was first to record the Talikote flaggy limestone and Muddebihal red sandstone. R. Bruce Foote (1876) had divided the Bhima Group (mainly of limestone) into lower clastic represented by sandstone and shale and upper mainly of limestone and shales. Further, Mahadevan (1947), Janardhana Rao et.al (1973), Mathur (1977), Mudholkar and Kale (1982) and Mishra et.al (1987) classify Bhima Group. However, Vivek S. Kale, V.G. Phansalkar et.al (1991) classify Bhima Group into Rabanapalli (clastic) formation and Shahabad (limestone) formations.

7.3 The Stratigraphic Column of the Bhima Group (after GSI) is furnished in **Table 7.1** below:

Table - 7.1

The Stratigraphic Column of the Bhima Group (after GSI)

Group	Sub-Group	Formation	Member	Thickness
Bhima Group (upper Proterozoic) (93-273 m.y)		Harwal-Gogi		5-10m
	Andola Sub-group in Pulsating basin environment (31-68 m.y)	Katamdevar-halli	Fossil shale member ortho-quartzite chert + pebble conglomerate	10-40m 16-18m
		-------Para – unconformity --------		
		Halkal		
			Flaggy dark grey and argillaceous	4-6m
			Massive dark grey and bluish grey	8-20m
		Shahabad	Variegated and siliceous/cherty	20-80m
	Sedam Sub-group with quiescent basin regime (62-2.5 m.y)		Blackish, light grey to bluish grey L.st	10-15m

Group	Sub-Group	Formation	Member	Thickness
			Slabby and flaggy Lst	4-8m
			Purple shale	2-40m
			Green/yellow shale	5-15m
		Rabanapalli	Siltstone	3-4m
			Quartzite / Intercalated Sand stone	5-15m
			Conglomerate / grit	1-2m

7.5 Regional Structure:

7.5.1 The general trend of all formations is North - South. The rectilinear East - West (EW) to North West (NW) - South East (SE) trending boundaries are faulted while the N-S and NNE-SSW linear trends show unconformable relation with the underlying gneisses.

7.5.2 Sediments of Bhima Group are structurally least disturbed and preserve their horizontal bedded character originally impressed at the time of deposition. Deformation is observed only in the vicinity of faults. The faults encountered have continued into the basement that has exercised control upon the basin configuration.

7.5.3 The basin is well known for its huge reserves of limestone and the newly discovered Uranium occurrence near Gogi. Regional Geological map of proposed Malked-1 Block is shown as **Plate-II.**

8.0 GEOLOGY OF THE BLOCKS

8.1 The rocks exposed in the blocks belong to the Shahabad formation of Sedam sub group of Bhima Group. MECL had explored Malkhed1 Block at a distance of around 5 kms north of previously explored Diggaon Block by MECL. The general Stratigraphic succession of the Malkhed1 Block based on field observations and available data/literature from nearby mine/areas is given in Table No. 8.1

Table No-8.1

Revised litho stratigraphy of the Bhima Group (after Kale, Phansalkar et.al 1991)

Formation	Member	Lithounits	Maximum Thickness (m)
Recent		Top soil	<4 m
Shahabad		Grey, argillaceous Micritic limestone. Dark, bluish grey, massive limestone. Variegated, siliceous and cherty limestone. Blue- grey, black-micritic limestone. Flaggy (Partly impure argillaceous and cherty)	<75 m

Formation	Member	Lithounits	Maximum Thickness (m)
		limestone.	
----------Gradational and Transitional Contact----------			
Rabanpalli Clastics	**Ekmai shale member:**	Ferruginous shale, with calcareous shale at top.	<70 m
	Kasturpalli-Glauconitic member:	Green, glauconite, fine grained sandstone and siltstone.	
	Kudrapalli Quartz Arenite Member:	Quatzitic sandstone (medium to fine grained).	
	Adki Hill conglomerate member:	Polymictic conglomerates and arkosic, gritty sandstone.	

8.2 Descriptionof Rock Types: Almost entire area of the blocks are concealed under quaternary sediments i.e. soil cover. Scanty scattered limestone outcrops are seen at places. The beds are horizontally disposed as noticed in nearby areas. Since most of the area is concealed under soil cover the strike and dip of the limestone beds is not observed in the blocks. Mining activities are currently ongoing in surrounding areas and limestone being excavated for manufacturing of cement. The lithological description of litho units from top to bottom as obtained from available data from nearby mines is given below.

8.2.1 **Top Soil**: The overburden top soil is black in colour, fine to silty, friable when dry and sticky when wet. The Over burden soil covers almost the entire Block area. The thickness of the soil varies from 0.10 m to about 19.00 m at places.

8.2.2 **Flaggy/ Siliceous Limestone:** This unit overlying massive grey limestone and is grey in color, fine grain, hard and flaggy/flaky in nature.

8.2.3 **Massive Grey Limestone:** Massive grey Limestone formation is dark grey in color, micritic, fine grained and compact. At places color varies from dark grey to light grey. Stylolite structures are often noticed in this unit. The thickness of this lithounit varies from 7.00 m to 78.00 m regionally. Massive grey limestone is cement grade to high grade and being excavated for manufacturing of cement in nearby areas.

8.2.4 **Shaly Limestone**: Shaly limestone is underlying formation of Massive grey limestone and is fine grained, thinly bedded and associated with thin shale bands/partings. Massive limestone to Shaly limestone transition zone is marked with frequency of shale partings. The frequency of shale parting/bands increases with depth. This lithounit forms the bottom most horizon and extends more than 70m depth from ground surface based on available data from nearby areas.

8.3 Block Structure: The rock formations within the Blocks are horizontally disposed and mostly concealed under top soil. At places, limestone beds dip 10 to 20^0 due North. The area is geologically undisturbed.

9.0 OBJECTIVE:

9.1. During the FY 2022-2023 2 Limestone Blocks Malkhed-1 and Malkhed-2 over an extent of 8.50 sq km and 9.52 sq km respectively were explored by MECL. Based on the feasibility of Limestone Blocks, State Govt. Of Karnataka has observed that the blocks are too large for auctioning hence requested MECL to make 04 smaller blocks out of 02 explored said blocks. After making 4 blocks, the present exploration does not meet the requirement of MEMC Rule for auctioning as individual block. Hence, infilling boreholes are required in each block to meet the requirement since all the other requirements of exploration have been completed in the newly carved out 04 blocks.

Objectives of the proposed exploration in Malkhed-1 North, Malkhed-1 South, Malked-2 North and Malkhed-2 South Blocks are as follows:

i. The objective of the present proposal is to meet the requirement for auction according to the Minerals (Evidence of Mineral Contents) Rule-2015 & Mineral (Auction) Rules-2015 (Amended upto 2021).

ii. To estimate the limestone resource at Inferred Category (**333** Category) in the individual blocks.

10.0 PLANNED METHODOLOGY OF EXPLORATION

In present exploration scheme for proposed Malkhed blocks, exploratory drilling (G-3) at an overall grid interval of 800 m interval is planned. The proposed activities along with associated work are described below.

10.1 Surface Drilling

10.1.1 The present exploration scheme is prepared by proposing total core drilling of 550.00m in 11 boreholes of NQ size. The boreholes would be drilled at 800 m grid interval. These boreholes will be drilled to fill the gap blockwise and make the blocks feasible for auction as Mining Lease according to the MEMC Rule. The borehole location map is enclosed as PLATE NO.-III.

10.2 Drill Core Logging and Sampling

10.2.1 Detailed drill core logging will be done with consideration of weathering, grain size, fossil contents, and color of various formations, intercalation / parting of shale, stylolite, and structure. On the basis of these parameters, grade of limestone can be broadly presented and it will also be helpful in sampling.

Primary samples will be drawn at 1m interval subject to change in lithology and core recovery. The following parameters shall be considered while sampling the drill cores.

1) Colour, grain size.
2) Fossil variation.
3) Thin intercalations of shale/siltstone.
4) Partially weathered zone.

For preparation of samples the borehole core will be longitudinally split into two equal halves by using core splitter. One half will be powdered to -100 mesh size and the other half will be kept for future studies. The powdered material will be mixed thoroughly and about 100 gm of samples will be taken for chemical analysis by successive coning and quartering as primary samples and rest of the material (-100 mesh size) will be kept as duplicate half for future reference.

Total number of primary samples likely to be generated would be 517 nos for Limestone. External check samples (10% of primary samples) would be 52 samples will be sent to NABL accredited Labs for analysis of 9 radicals.

10.3 Laboratory Studies

10.3.1 **Chemical Analysis**:Primary samples (517 Nos.) will be analyzed for 9 radicals, CaO, MgO, Al_2O_3, SiO_2, Fe_2O_3,SO_3, P_2O_5,K_2O and LOI by XRF method. 10% of primary samples i.e. 52 Nos. will be sent to NABL external labs as external check samples for analysis of 9 radicals CaO, MgO, Al_2O_3, SiO_2, Fe_2O_3, SO_3, P_2O_5, $K_2O$and LOI.

11.0 THE QUANTUM OF WORK PROPOSED

11.1 The Quantum of work proposed is given in **Table No.11.1**

Table No.11.1
Quantum of Work for Proposed Malkhed Block

Sl.No.	Description and Nature of Work	Unit	Target Malkhed
A	**GEOLOGICAL WORK AND SURVEYING**		
1	Survey Work		
	ii) Bore Hole Fixation	Nos	11
	iii) RL & Coordinate Determination by DGPS	Nos	4
B	**EXPLORATORY DRILLING**		
1	Drilling up to 300m (Soft Rock)	m	550
2	Drill Core Preservation	Per m	517
C	**LABORATORY STUDIES**		
1	**Chemical Analysis**		
	i) Primary Sampling (8 radicals CaO, MgO, Al2O3, SiO2, Fe2O3, SO3, P2O5, K2O and LOI.) by XRF	Nos	517
	iii) Check Sampling External 10% (8 radicals CaO, MgO, Al2O3, SiO2, Fe2O3, SO3, P2O5 and LOI.)	Nos	52
2	**Bulk Density Determination**		
	i) Bulk Density Determination	Nos	5
D	**Report Preparation (5 Hard copies with a soft copy)**	Nos	4
E	**Preparation of Exploration Proposal (5 Hard copies with a soft copy)**	Nos	1

12.0 COST ESTIMATE

12.1 The cost has been estimated based on actual schedule of rates mandated in the circular OM No. 61/1/2018/NMET dated 31st March 2020 for NMET funded projects which is **Rs. 143.92 Lakhs.** The detailed cost sheet for G-3 exploration for Limestone in proposed Malkhed Block is given in **Table No. 1** of Excel Workbook.

Table 12.1

Summary of Cost Estimates of Proposed Cluster of Malkhed Blocks (Malkhed-1 (North), Malkhed-1 (South), Malked-2 (North) and Malkhed-2 (South)), Bhima Basin, Gulbarga (Kalaburagi) District, Karnataka

SL. NO.	ITEM	ESTIMATED COST (Rs.)
1	Drilling	5,743,670
2	Geology & Survey	1,747,860
3	Laboratory	2,407,500
	Sub Total (1 to 4)	**9,899,030**
4	Exploration Report	1,979,806
5	Proposal Prepration	197,981
6	Peer Review Charges	120,000
	Grand Total	**12,196,817**
	GST 18%	2,195,427
	Total:	**14,392,244**
	Say Rs. in Lakhs	**143.92**

13.0 TIME SCHEDULE

13.1 The proposed exploration programme envisages exploratory drilling, laboratory studies and geological report preparation which will be completed within 06 months. Therefore, all activities have been planned with overlapping and tentative timeline has been worked out for total 06 months for the proposed project completion.

Table No. 13.1

Table- 2: Time schedule (in months) for G-3 Level Exploration for Limestone in Proposed Malkhed Blocks (Malkhed-1 (North), Malkhed-1 (South), Malked-2 (North) and Malkhed-2 (South)), Bhima Basin, District: Gulbarga (Kalaburagi), Karnataka

Sl. No.	Activities	Unit	MONTHS					
			1	2	3	4	5	6
1	Camp Setting	Month	■					
2	Surface Drilling (1 rig)	m.	■	■	■			
4	Geologist Party days in field (1 Party)	day	■	■				
5	Sampling Party days (1 Party)	day		■	■			
6	Laboratory Studies	Nos.			■	■	■	
7	Camp Winding	Month				■		
8	Geologist Party days in HQ (1 Party)	day				■	■	
9	Geological Report Writing with Peer Review	Month					■	■

Note: 1. Commencement of project may be reckoned from the day the exploration acreage is available along with all statutory clearances.

2. Time loss on account of monsoon/agricultural activity/forest clearance/local law & order problem may be additional to above time line.

14.0 JUSTIFICATION FOR TAKING UP EXPLORATION FOR LIMESTONE IN PROPOSED MALKHED BLOCKS, BHIMA BASIN, DISTRICT GULBARGA.

1. During the FY 2022-2023 2 Limestone Blocks Malkhed-1 and Malkhed-2 over an extent of 8.50 sq km and 9.52 sq km respectively were explored by MECL. Based on the feasibility of Limestone Blocks, State Govt. Of Karnataka has observed that the blocks are too large for auctioning hence requested MECL to make 04 smaller blocks out of 02 explored said blocks. After making 4 blocks, the present exploration does not meet the requirement of MEMC Rule for auctioning as individual block. Hence, infilling boreholes are required in each block to meet the requirement since all the other requirements of exploration have been completed in the newly carved out 04 blocks. Hence this proposal is being put up for discussion and approval
2. Due to the high demand of limestone nine limestone blocks viz. Kannur Wadi, Hanamaneri, Bommanalli, Chitapura SW, Sulahalli, Ravur, Satanur, Diggaon, Udagi, have been successfully auctioned in the state since 2015.

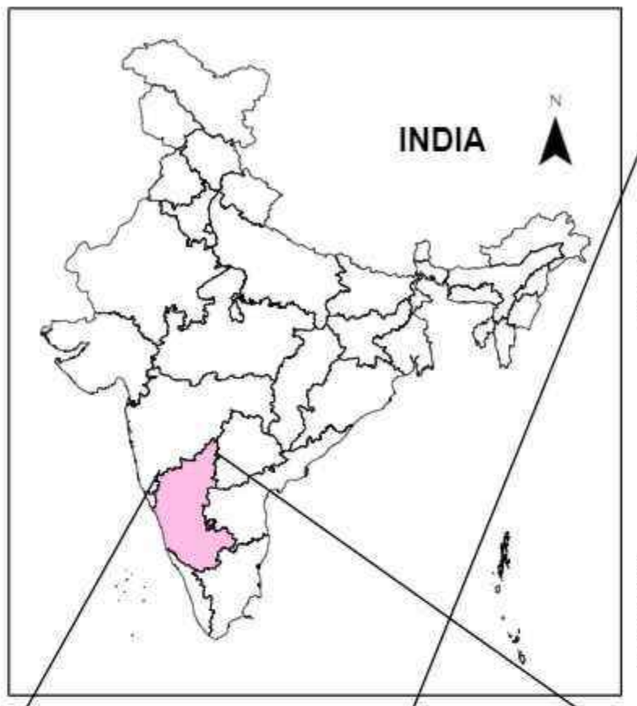
LIST OF PLATES

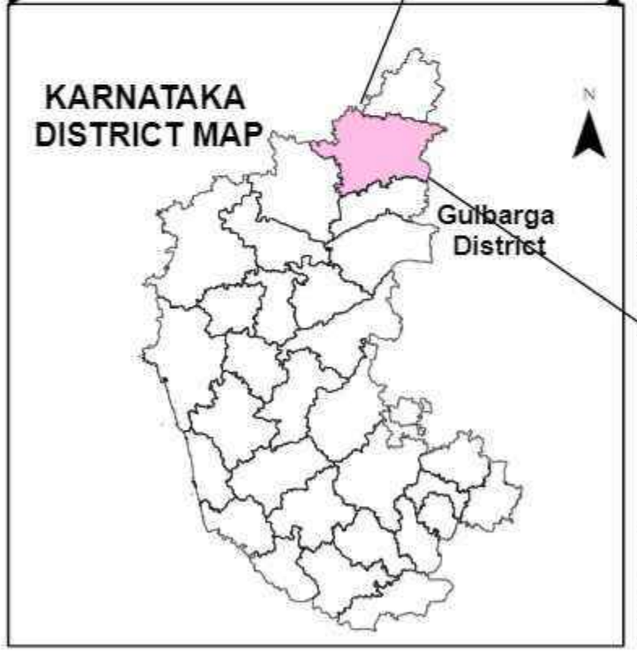
1. Location Map of Proposed Malkhed Blocks, Bhima Basin, Gulbarga District, Karnataka Plate-I
2. Regional Geology Map of Proposed Malked Limestone Blocks, Bhima Basin, Gulbarga District, Karnataka Plate-II
3. Geological Map showing the location of Proposed Borehole in Malked-1 and Malkhed-2 Limestone blocks Plate-IIIA, IIIB
4. Representative Geological Cross Sections , Bhima Basin, Kalaburagi District, Karnataka as Plate-IV

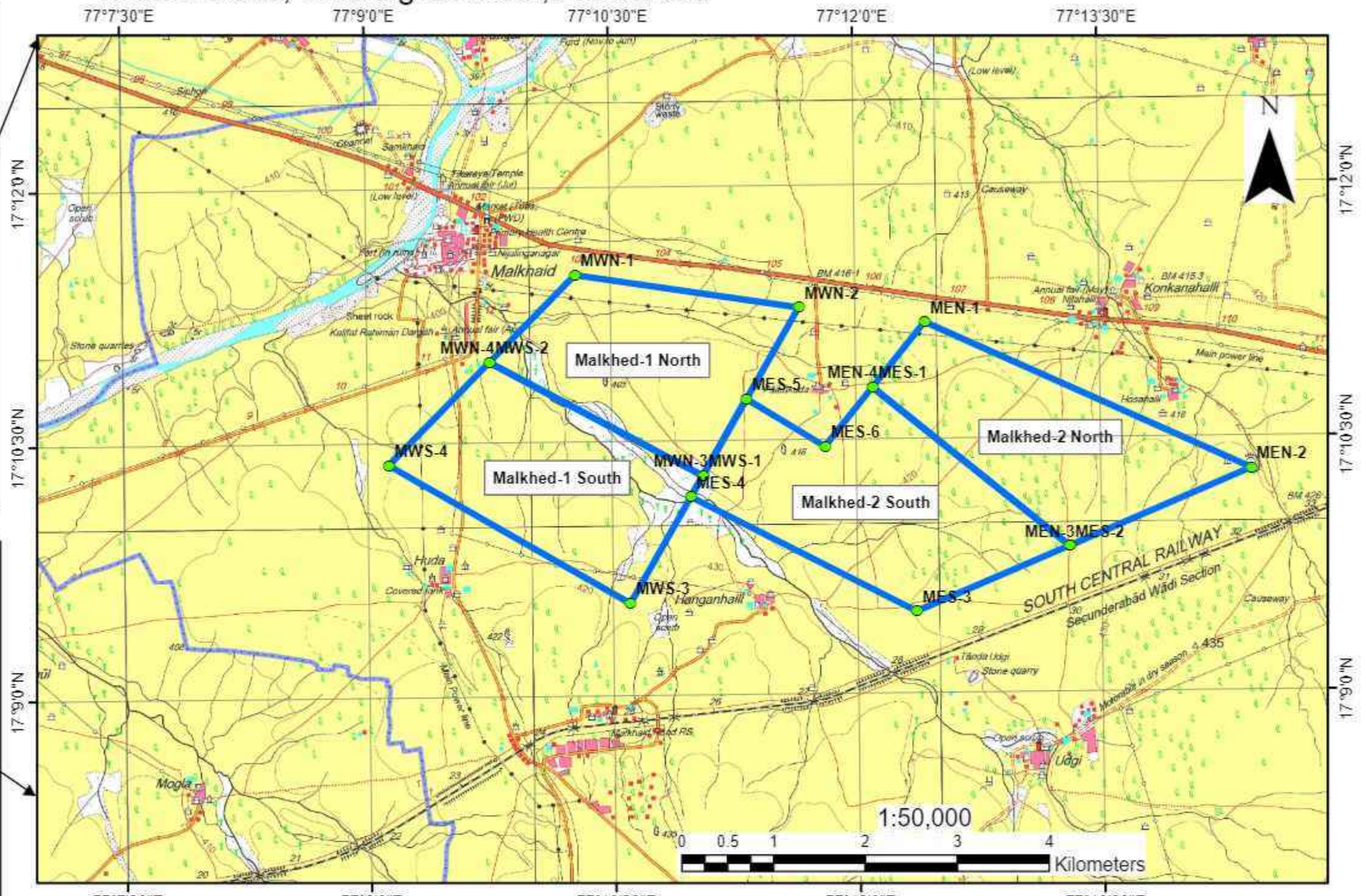
REFERENCES

1. A.V. Jayaprakash, F.S.1974-75, Preliminary investigation for Flux Grade and Cement Grade Limestone around Wadi, Gulbarga District, Karnataka. (GSI)
2. A.V. Jayaprakash, F.S.1977-78, Preliminary investigation for Flux Grade and Cement Grade Limestone in Bhima Basin, Gulbarga District, Karnataka. (GSI).
3. N.R. Pattabhiramaiah, D.S. Malkal, 1978, Preliminary Report on the Feasibility of Establishing a Cement Factory in Malkhaid, SedamTaluk, Gulbarga District.
4. Geological Report On Preliminary Exploration (G3) For Limestone In Malkhed - 1 Block Kalaburagi District, Karnataka. November-2023
5. Geological Report On Preliminary Exploration (G3) For Limestone In Malkhed - 1 Block Kalaburagi District, Karnataka. November-2023
6. MSTC E commerce Website

Location Map of Proposed Malkhed-1 North, Malkhed-1 South, Malkhed-2 North, Malkhed-2 Sourth Blocks, Bhima Basin, Gulbarga District, Karnataka







Legend

- Corner Points of Malkhed Blocks
- Malkhed Blocks

Block Boundary Corner Points of Proposed Malkhed-1 Blocks, Bhima Basin, Gulbarga District, Karnataka

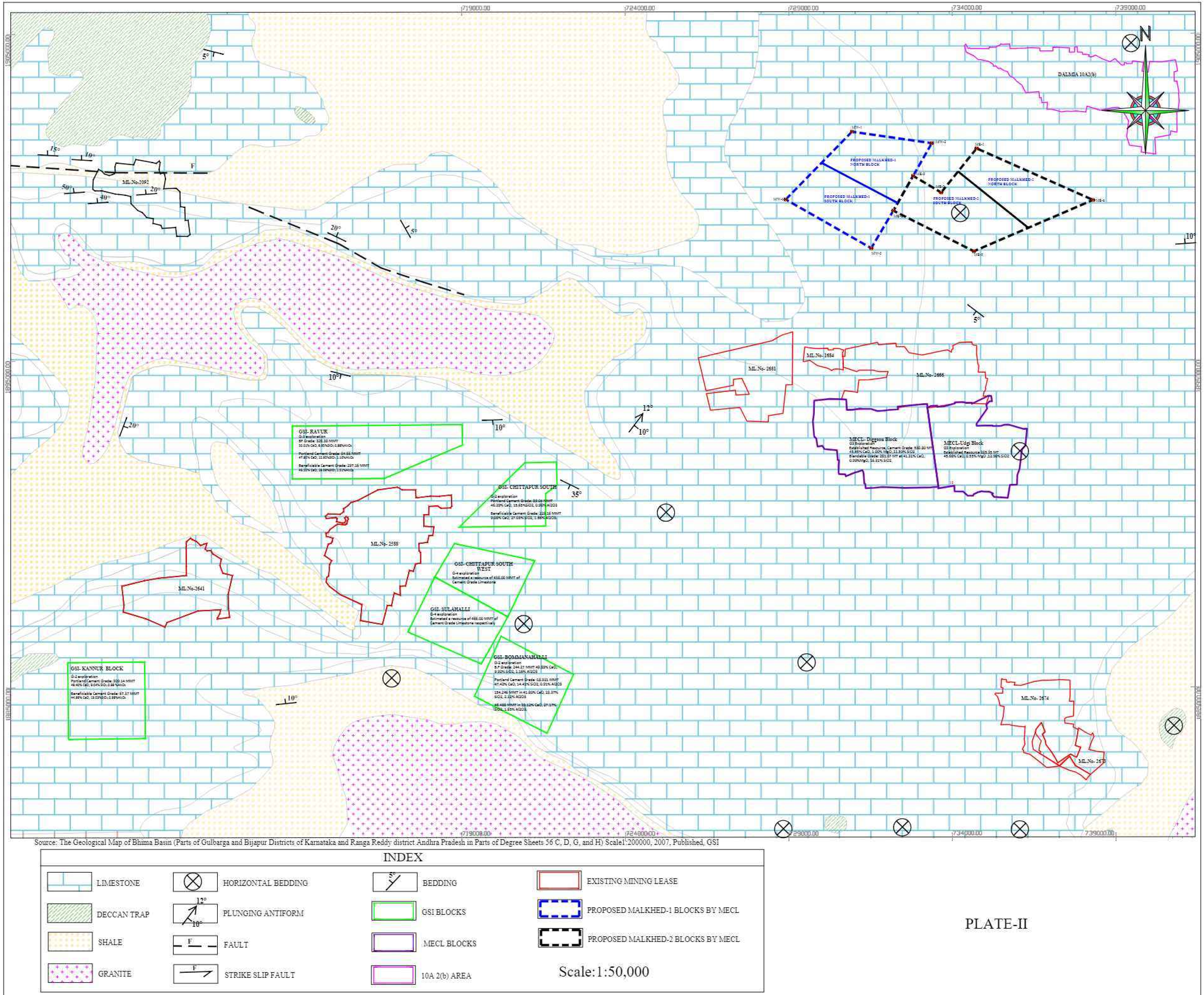
Sl. No.	Point Name	Block Name	UTM Co-ordinates (Zone-43)		DMS Co-ordinates (GCS WGS-1984)		Area (Sq. Km.)
			Northing (m)	Easting (m)	Latitude	Longitude	
1	MWN-1	Malkhed-1 North	1902026.46	730933.54	17° 11' 29.164"N	77° 10' 16.793" E	4.09
2	MWN-2		1901673.97	733372.91	17° 11' 16.808"N	77° 11' 39.184"E	
3	MWN-3		1899842.27	732329.94	17° 10' 17.628"N	77° 11' 03.202"E	
4	MWN-4		1901073.94	730003.63	17° 10' 58.528"N	77° 09' 44.973"E	
1	MWS-1	Malkhed-1 South	1899842.27	732329.94	17° 10' 17.628"N	77° 11' 03.202"E	4.40
2	MWS-2		1901073.94	730003.63	17° 10' 58.528"N	77° 09' 44.973"E	
3	MWS-3		1898450.41	731540.21	17° 09' 32.656"N	77° 10' 35.959"E	
4	MWS-4		1899950.51	728906.87	17° 10' 22.392"N	77° 09' 07.449"E	

Block Boundary Corner Points of Proposed Malkhed-2 Blocks, Bhima Basin, Gulbarga District,

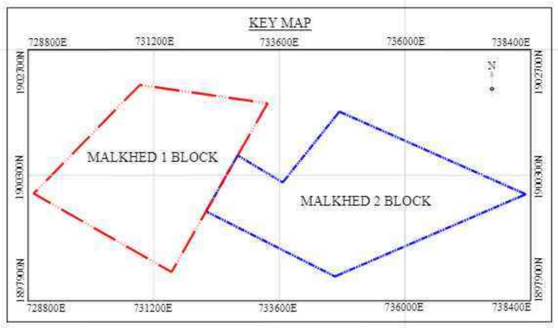
Sl. No.	Point Name	Block Name	UTM Co-ordinates (Zone-43)		DMS Co-ordinates (GCS WGS-1984)		Area (Sq. Km.)
			Northing (m)	Easting (m)	Latitude	Longitude	
1	MEN-1	Malkhed-2 North	1901515.79	734745.22	17° 11' 11.158"N	77° 12' 25.547"E	4.33
2	MEN-2		1899937.65	738302.91	17° 10' 18.515"N	77° 14' 25.283"E	
3	MEN-3		1899084.40	736325.58	17° 09' 51.509"N	77° 13' 18.067"E	
4	MEN-4		1900805.33	734176.34	17° 10' 48.266"N	77° 12' 06.029"E	
1	MES-1	Malkhed-2 South	1900805.33	734176.34	17° 10' 48.266"N	77° 12' 06.029"E	5.19
2	MES-2		1899084.40	736325.58	17° 09' 51.509"N	77° 13' 18.067"E	
3	MES-3		1898365.84	734660.41	17° 09' 28.761"N	77° 12' 21.466"E	
4	MES-4		1899609.93	732198.73	17° 10' 10.121"N	77° 10' 58.675"E	
5	MES-5		1900679.35	732802.66	17° 10' 44.675"N	77° 11' 19.512"E	
6	MES-6		1900162.53	733661.64	17° 10' 27.553"N	77° 11' 48.372"E	

PLATE-I

Survey of India Toposheet No: 56G/4



DALMIA 10A2(b)
PROPOSED MALKHED-1 NORTH BLOCK
PROPOSED MALKHED-1 SOUTH BLOCK
PROPOSED MALKHED-2 NORTH BLOCK
PROPOSED MALKHED-2 SOUTH BLOCK
ML.No-2092
ML.No- 2681
ML.No- 1684
ML.No- 2666
MECL- Diggaon Block
MECL-Udgi Block
GSI- RAVUR
GSI- CHITTAPUR SOUTH
ML.No- 2588
GSI- CHITTAPUR SOUTH WEST
GSI- SULAHALLI
ML.No-2641
GSI- BOMMANAHALLI
GSI- KANNUR BLOCK
ML.No- 2674
ML.No- 2673
Source: The Geological Map of Bhima Basin (Parts of Gulbarga and Bijapur Districts of Karnataka and Ranga Reddy district Andhra Pradesh in Parts of Degree Sheets 56 C, D, G, and H) Scale1:200000, 2007, Published, GSI
INDEX
LIMESTONE
DECCAN TRAP
SHALE
GRANITE
HORIZONTAL BEDDING
PLUNGING ANTIFORM
FAULT
STRIKE SLIP FAULT
BEDDING
GSI BLOCKS
MECL BLOCKS
10A 2(b) AREA
EXISTING MINING LEASE
PROPOSED MALKHED-1 BLOCKS BY MECL
PROPOSED MALKHED-2 BLOCKS BY MECL
PLATE-II
Scale:1:50,000



SCALE = 1:4,000

MWN-1
S-3
S-2
S-1
MWN-2
S-4
PBH-01
KML-10
R.L.-404.459m.
T.D.-50.00m.
PBH-02
KML-06
R.L.-409.219m.
T.D.-50.00m.
MWN-4
MWS-1
S-5
PBH-01
PBH-03
S-1'
KML-08
R.L.-402.502m.
T.D.-150.00m.
KML-09
R.L.-411.579m.
T.D.-50.00m.
MWS-04
MALKHED BLOCK-2
MWN-3
MWS-2
PBH-03
PBH-02
S-5'
KML-07
R.L.-413.204m.
T.D.-50.00m
S-2'
S-4'
S-3'
MWS-03

25 5 75 1 Meters

SCALE = 1:4,000

GENERAL INDEX

- BLOCK BOUNDARY OF MALKHED 1 NORTH BLOCK
- BLOCK BOUNDARY OF MALKHED 1 SOUTH BLOCK
- BLOCK BOUNDARY OF MALKHED 2 SOUTH BLOCK
- KML-08 / R.L.-402.502m. / T.D.-150.00m. — CORE BOREHOLE (MECL)
- PBH-02 — PROPOSED BOREHOLE
- S3' — S3 — CROSS SECTION LINE
- CONTOUR WITH VALUE
- METELLED ROAD
- HIGH TENSION LINE
- NALA
- LIMESTONE
- DIP & STRIKE

Block Boundary Corner Points of Proposed Malkhed-1 Block, Bhima Basin, Gulbarga District, Karnataka

Sl. No.	Point Name	Block Name	UTM Co-ordinates (Zone-43)		DMS Co-ordinates (GCS WGS-1984)		Area (Sq. Km.)
			Northing (m)	Easting (m)	Latitude	Longitude	
1	MWN-1	Malkhed-1 North	1902026.46	730933.54	17° 11' 29.164"N	77° 10' 16.793" E	4.09
2	MWN-2		1901673.97	733372.91	17° 11' 16.808"N	77° 11' 39.184"E	
3	MWN-3		1899842.27	732329.94	17° 10' 17.628"N	77° 11' 03.202"E	
4	MWN-4		1901073.94	730003.63	17° 10' 58.528"N	77° 09' 44.973"E	
1	MWS-1	Malkhed-1 South	1899842.27	732329.94	17° 10' 17.628"N	77° 11' 03.202"E	4.40
2	MWS-2		1901073.94	730003.63	17° 10' 58.528"N	77° 09' 44.973"E	
3	MWS-3		1898450.41	731540.21	17° 09' 32.656"N	77° 10' 35.959"E	
4	MWS-4		1899950.51	728906.87	17° 10' 22.392"N	77° 09' 07.449"E	

MINERAL EXPLORATION AND CONSULTANCY LIMITED
(Formerly Mineral Exploration Corporation Limited)

INTERPRETED GEOLOGICAL MAP WITH PROPOSED BOREHOLE LOCATION

MALKHED - 1 NORTH & MALKHED - 1 SOUTH BLOCKS

DISTRICT : KALABURAGI STATE : KARNATAKA

R.F. 1:4,000

PREPARED AT :

NON COAL GR CELL,
MECL, NAGPUR

MECL/EXPL./AUG-2024 | PLATE NO.: III-A | 03

732000E 732800E 733600E 734400E 735200E 736000E 736800E 737600E 738400E

1901600N 1901100N 1900600N 1898700N 1897900N

MEN-1
MEN-4
MES-1
MES-5
MES-6
MES-4
MES-3
MES-2
MEN-2
MEN-3

S1 S1' S2 S2' S3 S3' S4 S4' S5 S5' S6 S6' S7 S7'

KML-5
R.L-422.21m
T.D.-50.00m

KML-3
R.L-423.81m
T.D.-50.00m

KML-2
R.L-410.55m
T.D.-50.00m

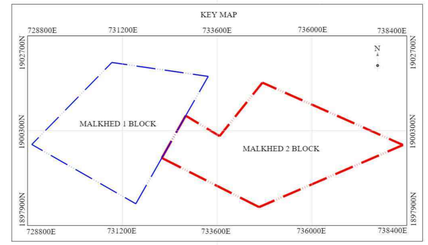
KML-01
R.L-414.76m
T.D.-50.00m

KML-04
R.L-421.62m
T.D.-50.00m

PBH-01
PBH-01
PBH-02
PBH-02
PBH-03

RAJIVNAGAR
NEELHALLI
HANGANHALLI
MALKHED BLOCK-1
MALKHED
NALA
HT LINE
HT LINE
SEASONAL WATER WAY

KEY MAP



SCALE = 1:4,000

0 250 500 750 1000 Meters

SCALE - 1:4000

Block Boundary Corner Points of Proposed Malkhed-2 Block, Bhima Basin, Gulbarga District, Karnataka

Sl. No.	Point Name	Block Name	UTM Co-ordinates (Zone-43)		DMS Co-ordinates (GCS WGS-1984)		Area (Sq. Km.)
			Northing (m)	Easting (m)	Latitude	Longitude	
1	MEN-1	Malkhed-2 North	1901515.79	734745.22	17° 11' 11.158"N	77° 12' 25.547"E	4.33
2	MEN-2		1899937.65	738302.91	17° 10' 18.515"N	77° 14' 25.283"E	
3	MEN-3		1899084.40	736325.58	17° 09' 51.509"N	77° 13' 18.067"E	
4	MEN-4		1900805.33	734176.34	17° 10' 48.266"N	77° 12' 06.029"E	
1	MES-1	Malkhed-2 South	1900805.33	734176.34	17° 10' 48.266"N	77° 12' 06.029"E	5.19
2	MES-2		1899084.40	736325.58	17° 09' 51.509"N	77° 13' 18.067"E	
3	MES-3		1898365.84	734660.41	17° 09' 28.761"N	77° 12' 21.466"E	
4	MES-4		1899609.93	732198.73	17° 10' 10.121"N	77° 10' 58.675"E	
5	MES-5		1900679.35	732802.66	17° 10' 44.675"N	77° 11' 19.512"E	
6	MES-6		1900162.53	733661.64	17° 10' 27.553"N	77° 11' 48.372"E	

GENERAL INDEX

MEN-1 / BLOCK-2 NORTH	BLOCK BOUNDARY OF MALKHED 2 NORTH BLOCK
MES-1 / BLOCK-2 SOUTH	BLOCK BOUNDARY OF MALKHED 2 SOUTH BLOCK
BLOCK-1 NORTH & SOUTH	BLOCK BOUNDARY OF MALKHED 1 NORTH & SOUTH BLOCK
KML-04 R.L-421.62m T.D.-50.00m	CORE BOREHOLE (MECL)
PBH-02	PROPOSED BOREHOLE
S3' S3	CROSS SECTION LINE
400	CONTOUR WITH VALUE
	METELLED ROAD
	HIGH TENSION LINE
	NALA
	LIMESTONE
	SOIL

MINERAL EXPLORATION AND CONSULTANCY LIMITED
(Formerly Mineral Exploration Corporation Limited)

INTERPRETED GEOLOGICAL MAP WITH PROPOSED BOREHOLE LOCATION

MALKHED - 2 NORTH & MALKHED - 2 SOUTH BLOCKS

DISTRICT : KALABURAGI STATE : KARNATAKA

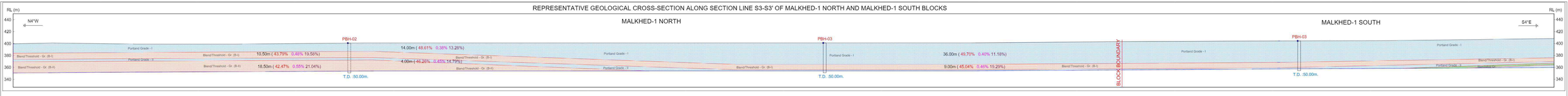
R.F. 1:4,000

PREPARED AT :

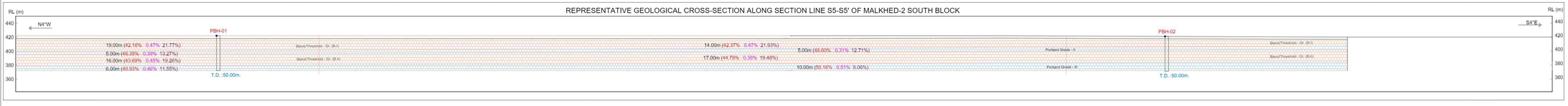
SURVEY AND MAP SECTION,
MECL, NAGPUR

MECL/EXPL./AUG-2024 | PLATE NO.: III-B | 04

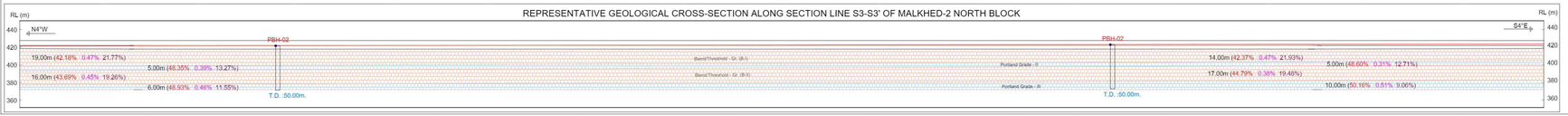
REPRESENTATIVE GEOLOGICAL CROSS-SECTION ALONG SECTION LINE S3-S3' OF MALKHED-1 NORTH AND MALKHED-1 SOUTH BLOCKS



REPRESENTATIVE GEOLOGICAL CROSS-SECTION ALONG SECTION LINE S5-S5' OF MALKHED-2 SOUTH BLOCK



REPRESENTATIVE GEOLOGICAL CROSS-SECTION ALONG SECTION LINE S3-S3' OF MALKHED-2 NORTH BLOCK



Scale

0 40 80 120 160 200

Metres

INDEX

- SOIL
- CEMENT (PORTLAND) GRADE LIMESTONE
- BLENDABLE GRADE LIMESTONE
- BLENDABLE/ THRESHOLD GRADE LIMESTONE

PBH-02 Name of Borehole

8.00m (44.26% 0.50% 20.21%)
Thick.(m) (CaO% MgO% SiO_2%)

T.D. :50.00m. Total Depth in meters

MINERAL EXPLORATION AND CONSULTANCY LIMITED
(Formerly Mineral Exploration Corporation Limited)

REPRESENTATIVE GEOLOGICAL CROSS-SECTIONS

MALKHED - 1 AND MALKHED-2 BLOCKS

DISTRICT : KALABURAGI | STATE : KARNATAKA

R.F. 1:2,000

PREPARED AT :

NON-COAL GR CELL,
MECL, NAGPUR

MECL/EXPL/AUG-2024	PLATE NO.- IV	05

TABLE- 1: COST SHEET FOR G-3 LEVEL EXPLORATION FOR LIMESTONE IN PROPOSED MALKHED BLOCK (Malkhed-1 (North), Malkhed-1 (South), Malked-2 (North) and Malkhed-2 (South)), DISTRICT- GULBARGA (KALABURAGI) , KARNATAKA

Total Area - 18.01 Sq Km; Nos. of Borehole - 11 ; Borehole depth range - 50m ; Completion Time - 06 Months

S.N	Item of Work	Unit	Rates as per NMET SoC 2020-21		Estimated Cost of the		Remarks
			SoC-Item -Sl No.	Rates as per SoC	Qty.	Total Amount (Rs)	
A	GEOLOGICAL WORK						
1	Mapping, Borhole logging & Sampling & Report writing						
a	Charges for one Geologist per day at HQ	day	1.3	9,000	30	2,70,000	
b	Charges for one Geologist per day at field	day	1.3	11,000	60	6,60,000	
c	Labour for Geologist (2 Nos)	day	5.7	522	120	62,640	Amount will be reimburse as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher
d	Charges for one Sampler per day (1 Party)	one sampler per day	1.5.2	5,100	65	3,31,500	
e	Labours for sampling work (4 Nos)	day	5.7	522	260	1,35,720	Amount will be reimburse as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher
2	Survey Work						
a	Bore Hole Fixation and determination of co-ordinates & Reduced Level of the boreholes and block cardinal points by DGPS	Per Point of observation	1.6.2	19,200	15	2,88,000	Block cardinal point- 4 Borehole- 11
	Sub-Total A					17,47,860	
B	DRILLING						
1	Drilling -Soft rock	m	2.2.1.1b	7,168	550	39,42,400	MoC Rate
2	Land / Crop Compansation (in case the BH falls in agreecultural Land)	per BH	5.6	20,000	11	2,20,000	Amount will be reimburse as per actuals or max. Rs. 20000 per BH with certification from local authorities
3	Construction of concrete Pillar (12"x12"x30")	per borehole	2.2.7a	2,000	11	22,000	
4	Transportation of Drill Rig & Truck associated per drill	Km	2.2.8	36	1,200	43,200	To & fro
5	Monthly Accomodation Charges for drilling Camp (up to 1 Rigs)	month	2.2.9	50,000	3	1,50,000	
6	Drilling Camp Setting Cost	Nos	2.2.9a	2,50,000	1	2,50,000	
7	Drilling Camp Winding up Cost	Nos	2.2.9b	2,50,000	1	2,50,000	
8	Road Making (Flat Terrain)	Km	2.2.10a	22,020	2	44,040	Road Making will be considered as per the requirement and Road Making Charges will be reimbursed accordingly.
9	Drill Core Preservation	per m	5.3	1,590	517	8,22,030	
	Sub Total B					57,43,670	
C	LABORATORY STUDIES						
1	Chemical Analysis						
i)	Primary samples						
	a. For 10 radicals i.e. CaO, MgO, Al2O3, SiO2, Fe2O3, Na2O, SO3, P2O5, K2O by XRF and LOI	Nos	4.1.15a	4,200	517	21,71,400	
ii)	Check samples External(10%)						
	a. For 10 radicals i.e. CaO, MgO, Al2O3, SiO2, Fe2O3, Na2O, SO3, P2O5, K2O by XRF and LOI	Nos	4.1.15a	4,200	52	2,18,400	
v)	Bulk Density Determination						
	Bulk Density Determination	No.	410	3,540	5	17,700	
	Total - C					24,07,500	
D	Sub Total (A to C)					98,99,030	
E	Geological Report Preparation		5.2	For the projects exceeding Rs. 60 Lakhs but less than 150 Lakhs: A Minimum of Rs. 2.5 lakhs or 5% of the work whichever is more		19,79,806	4 Separate GRs four blocks (Malkhed-1 (North), Malkhed-1 (South), Malked-2 (North) and Malkhed-2 (South))

S.N	Item of Work	Unit	Rates as per NMET SoC 2020-21		Estimated Cost of the		Remarks
			SoC-Item -Sl No.	Rates as per SoC	Qty.	Total Amount (Rs)	
F	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		1,97,981	
G	Peer review Charges		As per EC decision			1,20,000	4 Separate GRs four blocks (Malkhed-1 (North), Malkhed-1 (South), Malked-2 (North) and Malkhed-2 (South))
H	Total Estimated Cost without GST					1,21,96,817	
I	Provision for GST (18% of H)	%				21,95,427	GST will be reimburse as per actual and as per notified prescribed rate
J	Total Estimated Cost with GST					1,43,92,244	
				or Say Rs. In Lakhs		*143.92*	

Note - 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.