Proposal for Khatera, Yavatmal District, Maharashtra for Preliminary Exploration (G3 stage) under NMET.

Commodity: Limestone

By

Maheshwari Mining Private Limited

Place: Kolkata

Date: 12/12/2024

Summary of the Block G3 Stage Exploration

	Features	Details
	Block ID	Khatera
	Current Exploration Agency	Maheshwari Mining Private Limited
	Previous Exploration Agency	-
	G4 stage Geological Report (Previous stage Geological Report)	
	Commodity	Limestone
	Mineral Belt	The Penganga Group of sedimentary rocks
	Completion Period with entire Time schedule to complete the project	
	Objectives	Objectives of the Preliminary Exploration (G3) over an area of 6.39sq km as follows: 1. Geological mapping on 1:4000 scale and demarcating limestone occurrences with the structural features i.e. strike, dip, lineation/foliation, etc., for medium to high grade Limestone deposits. 2. Based on **the outcome of the geological mapping**, bedded stratiform regular deposit a with 800 m and closer spacing, 14 nos. of vertical boreholes with 700m depth. The boreholes planned with maximum depth of 50m. 3. Chemical Analysis of core samples and surface samples. 4. Gradewise determination of dimension of limestone and estimation of tonnage, grade and mineral content in G3 level as per UNFC guidelines & Minerals (Evidence of Mineral Contents) Rule (2015), amended in 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	The work will be carried out by proposed agency
	Name/ Number of Geoscientists	In field: Two Geologists. At Headquarters: Two Geologists

	Expected Field days (Geology) Geological Party Days	Item execution duration 12 Months and actual field days of field geologist 150 days and 60 days for HQ.		
1	**Location**	**POINT_ID**	**Latitude**	**Longitude**
		A	19.78	78.91
		B	19.76	78.91
		C	19.76	78.94
		D	19.78	78.94
	Villages	Khatera		
	Tehsil/ Taluk/Mandal	-		
	District	Yavatmal		
	State	Maharashtra		
2	**Area (hectares/ square kilometres)**			
	Block Area	6.39sq km		
	Forest Area	NA		
	Government Land Area	NA		
	Private Land Area	NA		
3	**Accessibility**			
	Nearest Rail Head	Wani Railway Station (40km)		
	Road	Adilabad- Korpana (NH-353B)		
	Airport	Nagpur (205km)		
4	**Hydrography**			
	Local Surface Drainage Pattern (Channels)	Radial pattern		
	Rivers/ Streams	Penganga		
5	**Climate**			
	Mean Annual Rainfall	Average annual rain fall is around 100cm mostly during monsoon		
	Temperatures (December) (Minimum) Temperatures (June) (Maximum)	Average temperature 15° in December While Average temperature 38° C during May-June		
6	**Topography**			

	Toposheet Number	56I/13
	Morphology of the Area	The area under report forms the lowland in the valley of the Penganga river, to the south of which lie, the Satmala Hills (Δ 2065 and Δ 1794). The hill mass of Δ1031 in the west and the hillock Δ 1067 in the east may be mentioned for providing relief in an otherwise low rolling country of sedimentary rocks. In the south-east and north-west, contrast in relief is accentuated because of the occurrence of Deccan Trap. The topography appears to be at the youthful stage as exemplified by the state of dissection of hillmass of Δ1031
7	**Availability of baseline geoscience data**	
	Geological Map (1:50K/ 25K)	**Available**
	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**	After desktop study on Limestone in Khatera, Yavatmal District, Maharashtra following points have been considered to propose the block for Preliminary Exploration for limestone in G3 stage: On the bank of Penganga River near Mangurda village the limestone beds trend NW-SE with a dip of 20 degree to 25 degree towards northeast, which is part of Mangurda formation. The limestone of Mangurda formation also occur to the other side of Penganga river in Maharshtra in Bahilampur area. The DGM Maharastra developed a block in Bahilampur area with avg grade of limestone is CaO: 46.53, MgO: 3.3, SiO2:7.2, Fe2O3: 2.7 **MMPL has taken traverse in the area and collected 10 BRS sample having CaO value as follows:**

S.No.	**Sample_ Id**	**CaO**	

		1	GGL-1	**43.64**	
		2	GGL-2	**51.06**	
		3	GGL-6	**29.46**	
		4	GGL-7	**45.99**	
		5	GGL-9	**31.97**	
		6	GGL-10	**25.87**	
		7	GGL-12	**28.86**	
		8	GGL-13	**29.29**	
		9	GGL-15	**25.11**	
		10	GGL-16	**44.69**	

Detailed description on the following titles to be made in the proposal.

1. **Block Summary**

Physiography

The area is the lowland in the valley of the Penganga River, to the south of which lie, the Satmala Hills (Δ 2065 and Δ 1794). The hill mass of Δ1031 in the west and the hillock Δ 1067 in the east may be mentioned for providing relief in an otherwise low rolling country of sedimentary rocks. In the south-east and north-west, contrast in relief is accentuated because of the occurrence of Deccan Trap. The topography appears to be at the youthful stage as exemplified by the state of dissection of hillmass of Δ1031. This limestone terrain is structurally an anticlinal roll and the drainage is radial.

Background Geology (Regional Geology, Geology of the Block).

PENGANGA GROUP

The rock of the Penganga group are unmetamorphosed sedimentary beds rest noncomformably on the crystalline rocks. Conjectural correlation by S.A. Karim (1924) of the beds on the lower reaches of Kaddam River, some 60 km. to the SSE of Adilabad, with the Penganga is untenable as the former resemble the Pakhal beds of Ramgundam of which these are mere north-westward extension (Ramilngaswamy and Prasannan, 1975; present author, November, 1977).

Shale

Shales are reddish brown to purple in colour, soft and indurated to fissile in structure. They are laminated to thinly bedded and at places exhibit ball up and nodular structures. The individual beds vary in thickness from 1 to 5 cm. At places bleach spots are also seen in shales as deoxidation spheres. Shales are intercalated with thin bands of limestone, at places argillaceous in nature, varying in thickness from a few cm to 0.5 m. These bands are grey to greenish grey and pink to fawn in colour. At places veins of pink to white calcite have filled up the shales along the joint planes.

Limestone and dolomitic limestone

Limestones are thinly to thickly bedded in nature and vary from light grey to dark grey, white to pinkish white and buff in colour, fine grained, compact and contain partings of calcareous shale along the bedding planes. Major part of the area is covered by the dominant thinly to thickly bedded variety of limestone which is seen all along the Penganga River on either sides in toposheet No. 56 I /13 and I/14. Fine grained, hard, compact and pinkish white to own coloured dolomitic limestone is seen in the southernmost part of the area mapped. Jain (1976-77) mapped the limestones around Kayar and Suknegaon as dolomitic limestones

Mangurda Limestone Formation

In the north-eastern most corner of the area under report, on the right bank of the Penganga River at

Mangurda, limestones occur. These were shown on the map by Hughes (1877) and Fedden. These limestones contain at the base an intraformational conglomerate followed by a succession of light grey and pale pink coloured limestones interbedded with a dark grey dolomite. In the bed of the river and on the bank at Mangurda, the beds trend NW-SE and dip 20° -25° towards north-east. The western limit of the outcrop in the bed of the river is contorted and therefore its contact with the Bela Shale must be faulted.

The Mangurda Limestone presumably extends down the Penganga upto the interstate boundary with Maharashtra which crosses the river midway between Mangurda and Parsola, to its east.

Regional Stratigraphic Setup

Age	Group	Subgroup	Formation	Composite vertical lithofacies description	Thickness
1	2	3	4	5	6
Recent	-	-	-	Alluvium, calcrete, calc-tufa	12 m
Quaternary	-	-	Sat Nala sandstone	Pebbly, cross-bedded sandstone	6 m
Eocene	Deccan Trap	-	-	Volcanic flows of basalt with Inter-Trap Sandstone (fossiliferous)	1 m+
				Infra-Trap Sandstone	6 m
				Unconformity	
Upper Precambrain			Mangurda Limestone	Grey limestone with interbedded dark grey dolostone	300 m
				----------Fault, Disconformity-------	
			Bela Shale	Red and green laminated shale	250 m
	Penganga Group	Jainath Subgroup	Goatkur Limestone	Grey flaggy limestone Grey massive limestone, traversed by quartz veins Light grey limestone with interbedded chert-jasper(+ manganese) horizons and intra-formational flat pebble boulder conglomerates	
				Red, green, grey limestone/granite- limestonemixtite	150 m (Max)
				Pale red flaggy limestone Glauconitic and felspathic sandstone	

Saorgaon laminated limestone
Saorgaon red shale/mudstone

Scope for proposed exploration

a. The objective of this project is to estimate the resource of Limestone in the area and demarcation of limestone extention.

b. Borehole planning on the basis of previous data and present work; chemical analysis of trenching and pitting in the potential areas to delineate the lithological thickness of Limestone deposits and to determine the associated stratigraphic sequences in the area.

2. Previous Work

The previous work done by GSI in 1986. The Geological extension of Penganga Group of sedimentary rocks occurs to the immediate north and east of Adilabad, in the Yavatmal and Chandrapur Districts of Maharashtra. Penganga River between Gomutri in the north-west and Mangurda in the north-east forms the northern boundary of the area mapped. Than stretch of the river also forms the interstate boundary. The Penganga Group extends across the river into the territory of Maharashtra to its north and thus the northern limit of the area mapped is warranted by administrative restriction and not by geological considerations.

Cement Corporation of India investigated the area on the left bank of Mathadi vagu to the north of Bhimsari and established in 1968 the availability of cement grade limestone.

W.T. Blanford is on record to have mapped the present area in 1866 and a map on 1:253,440 scales probably by W.T. Blanford is extant in the Geological Survey of India (Heron, 1949). T.W.H. Hughes (1877) together with F. Fedden produced a map for the area extending eastwards of the north-eastern margin of the area under report.

Cement Corporation of India investigated the area on the left bank of Mathadi vagu to the north of Bhimsari and established in 1968 the availability of cement grade limestone. Cement Corporation of India Ltd (Warrier and Gupta, 1968) investigated by drilling (983.64 m in 32 boreholes; IBM, 1972). The limestone in an area to the north of Bhimsari and proved a sizeable reserve to sustain a cement factory proposed to be built in the vicinity. Their drill-hole sections hold considerable detail for stratigraphic interpretation.

3. Block description

POINT_ID	Latitude	Longitude
A	19.76	78.89
B	19.75	78.89
C	19.75	78.94
D	19.76	78.94

4. Planned Methodology

In accordance to the objectives set for preliminary exploration (G3 level of exploration) for Limestone Khatera, Yavatmal District, geological mapping in 1:4000 scale, core drilling, core sampling, chemical studies, petrological and mineralogical studies are proposed in the block. The exploration will be carried out as per Minerals (Evidence of Mineral contents) Amendment Rules-2021. Accordingly, the details of different activities to be carried out are presented in subsequent paragraphs.

4.1.Topographic Surveying

Topography survey will be carried in the area (6.39Sq. Km) and all the surface features will be marked in the 1:4000 scale plans. The block boundary will be surveyed by DGPS / total station in WGS-84 Datum and demarcation of the boundary pillars to enable the block auctionable. The reduced level and coordinate of the boreholes would be surveyed by DGPS/ total station.

4.2. Geological Mapping

Geological mapping on 1:4000 scale in the area (6.39Sq. Km) will be carried out by taking geological traverses. The contacts of different formations, surficial lithology, structural features, etc. will be noted in detail. The geological map on 1:4000 scale will be generated based on the details gathered during the field visit.

4.3. Core Drilling

Based on **the outcome of the geological mapping**, after review for bedded stratiform regular deposit a with 800m spacing, 14 nos. of vertical boreholes with 700 m total depth of core drilling are being proposed over the area 6.39Sq. Km to intersect the mineralized zone. The maximum depth will be 50 m of each bore hole.

4.4. Core Logging

The drill cores would be logged systematically viz. details of lithounits, colour, structural feature, texture, mineralization, beside the recovery, rock quality designation would be recorded.

4.5.Core Sampling

a.) The drill core will be split into two equal halves and one part would be preserved in the core box. The other half will be powdered to -200 mesh size and the same would be divided into four parts (250gm each) through coning and quartering. One part of 250 gm sample will be sent to chemical laboratory for analysis, second part to be preserved in the camp as duplicate sample, third part to be utilized for preparing composite sample for individual ore band and the fourth part would keep as either check sample or sample to be used for any other specific purpose.

The length of each sample will be kept 0.50 m-1.0m depending upon the width of particular types of ore and its physical character. The primary core samples will be analyzed for five radicals i.e., Total

CaO, MgO, SiO2, MnO, K2O, Fe2O3, Al2O3, Na2O, TiO2, SO3, P2O5, Cr203, ZnO, V2O5 & LOI by XRF methods.

4.6. Petrographic & Minerographic Studies

Thin and polished section studies of the out-crop samples and the core samples will be studied for detailed petrographic and minerographic characteristics. These samples will be drawn from ore zones and associated rocks. A provision of 10 nos. specimens for petrographic and 10 nos. specimens for minerographic studies has been kept for the proposed area.

4.9. Bulk Density Determination

In addition, bulk density determination of 5 nos. of samples will be carried out for the proposed block.

5. Nature Quantum and Target

Quantum of work for Preliminary Exploration (G3 Stage) of Limestone, Khatera, Yavatmal, District, Maharashtra			
Sl No.	**Item of work**	**Unit**	**Quantity**
A	**Detailed Geological Mapping**		
1	on 1:4000 Scale	Sq. Km	6.39
B	**Survey Work by surveyor days**		
1	Demarcation of proposed boundary, Fixation of Borehole and determination of co-ordinates & Reduced Level (RL) of the boreholes by DGPS	Per point of observation	18
2	Topographic Survey and surface contouring 1:4000 scale	Sq. Km	6.39
C	**Drilling**		
1	Core drilling	m	700
2	Borehole Pillaring (12"x12"x30")	nos	14
D	**Chemical Analysis**		
i)	Core Samples + Check Samples) Chemical analysis by XRF radicals (Al2O3%, Fe%, Fe2O3%, SiO2%, P%, S%, In-solubles & LOI) + other oxides and traces	nos	750
E	**Physical Analysis**	**nos**	
1	Preparation of standard thin section of rock	nos	10
2	Complete Petrographic Studies	nos	10
3	Preparation of polished thin section of rock.	nos	5
G	**Bulk Density Determination**	**nos**	5
H	**Report Preparation (as per MEMC Amendment Rule 2021/UNFC)**	**nos**	**1**

1. **Manpower deployment**
2. **Break-up of expenditure**

Estimated cost for Preliminary Exploration (G3 Stage) of Limestone, Khatera, Yavatmal, Maharashtra							
Total area: 6.39sq km, Period of Completion: 12 months BH: 14nos 700m , review: after 5 months							
			Rates as per NMET		Estimated Cost of the		
			SoC 2020-21		Proposal		
S. No.	Item of Work *	Unit *	SoC- Item No. *	Rates as per SoC * (a)	Qty. (b)	Total Amount (Rs) (a*b)	Remarks
A	Geological Mapping Other Geological Work & Surveying						
	Geological mapping, (1:4,000 scale) & Trenching , drilling work						
i	a. Charges for Geologist per day (Field) for geological mapping & trenching work, drilling work	day	1.2. b	11,000	150	1650000	1:4,000 scale mapping of 6.39sq km and drilling of 12 Nos. Boreholes
ii	b. Labours Charges; Base rate (for 2 labours per Geologist	day	5.7	526	300	157800	Amount will be reimbursed as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher.
	c. Charges for Geologist per day (HQ)	day	1.2. a	9,000	60	540000	
	Sub Total- A					2347800	

B	Survey work						
a	DGPS Survey for BH fixation & RL determination	Per Point of observation of observation	1.6.2	19,200	16	307200	Bore hole: 12 Cardinal points: 4
b	Charges of one qualified surveyor with Total Station for carrying out topographical survey in different RF and surface contouring at different interval, fixation of borehole and determination of co- ordinates & Reduced Level (RL) of the boreholes with total station etc.		1.6.1a	8,300	45	373500	For Topographical survey
c	Labours Charges for survey work;	day	5.7	526	180	94680	4 labours per day
	Sub-Total B					775380	
C	Trenching/Pitting						
	a) Trenching	per cu.m	2.1.2	3,300	0	0	
	Sub Total C					0	
D	DRILLING (after review)- In -house						
1	Drilling up to (Soft Rock) 800x800 grid	m	2.2.1.4a	7,168	700	5017600	
3	Land / Crop Compansation (in case the BH falls in agricultural Land)	per BH	5.6	20,000	14	280000	As per actuals
4	Construction of concrete Pillar (12"x12"x30")	per borehole	2.2.7a	2,000	14	28000	
5	Transportation of Drill Rig & Truck associated per drill (1 rig)	Km	2.2.8	36	3,308	119088	Raniganj to Khatera to and fro

6	Monthly Accomodation Charges for drilling Camp (up to Rigs)	month	2.2.9	50,000	2	100000	
7	Drilling Camp Setting Cost	Nos	2.2.9a	250000	1	250000	
8	Drilling Camp Winding up Cost	Nos	2.2.9a	250000	1	250000	
9	Road Making (Flat Terrain)	Km	2.2.10a	22,020	3	66060	As per actuals if or when required
10	Drill Core Preservation	per m	5.3	1,590	700	1113000	
11a	Charges for one Sampler per day	one sampler per day	1.5.2	5,100	60	306000	
11b	Labours (4 Nos)	day	5.7	526	240	126240	Amount will be reimbursed as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher.
	Sub Total D					7655988	
E	LABORATORY STUDIES						
1	Chemical Analysis						
i)	Geochemical Sampling-Surface samples (Bedrock/Channel /Soil/Stream sediment)						
	a. Analysis of major oxides by XRF	Nos	4.1.15a	4,200	50	210000	
ii)	Surface Check samples (10% External)					0	
	a. Analysis of major oxides samples by XRF	Nos	4.1.15a	4,200	5	21000	
iii)	Trench & Check Samples from Trench					0	

	a. Analysis of major oxides samples by XRF	**Nos**	**4.1.15a**	**4,200**	**0**	**0**	
	Trench samples					**0**	
iv)	**Trench Check samples (10% External)**					**0**	
	a. Analysis of major oxides samples by XRF	**Nos**	**4.1.15a**	**4,200**	**0**	**0**	
v)	**BH Core samples**						
	a. Analysis of major oxides samples by XRF	**Nos**	**4.1.15a**	**4,200**	**700**	**2940000**	
vi)	**BH Core samples (10%External)**						
	a. Analysis of major oxides samples by XRF	**Nos**	**4.1.15a**	**4,200**	**70**	**294000**	
2	**Physical & Petrological Studies**					**0**	
i	**Preparation of thin section**	**Nos**	**4.3.1**	**2,353**	**10**	**23530**	
ii	**Study of thin section**	**Nos**	**4.3.4**	**4,232**	**10**	**42320**	
iii	**Preparation of polish section**	**Nos**	**4.3.2**	**1549**	**5**	**7745**	
iv	**study of polished section**	**Nos**	**4.3.4**	**4,232**	**5**	**21160**	
v	**Digital Photographs**	**Nos**	**4.3.7**	**280**	**10**	**2800**	
vii	**Bulk density analysis**	**Nos**	**4.8.1**	**1,605**	**5**	**8025**	
	SEM Studies	**per hour**					
viii	**EPMA studies**	**per hour**	**4.4.1**	**8,540**	**0**	**0**	
	Total E					**3570580**	
F	**Total A to E**					**14349748**	
G	**Geological Report Preparation**	**5 Hard copies with a soft copy**	**5.2**	**ii**		**717487**	**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	1	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. 5.0 Lakhs whichever is less		286994	EA will be reimbursed after submission of 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					15384229	
K	Provision for GST (18% of J)					2769161	GST will be reimburse as per actual and as per notified prescribed rate
L	Total Estimated Cost with GST					18153390	
				Rs. In Lakhs		18153390	
Note:							
1	Strict adherence to the Ministry of Finance's and GFR guidelines is mandatory. Every transaction must adhere to GFR rule 21.						
2	In case of delay/non- performance, the appropriate action will be taken by competent authority against delinquent agency as per prevailing govt. of India rules/guidelines on procurement.						

3	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 execution of the project by NEA on its own, a Certificate regarding non outsourcing of any component/project is required.
4	Necessary efforts should be made to minimize any adverse impact on the environment during exploration activities.
5	Any item of work not mentioned above shall be added as per SoC

Time Schedule/ Action Plan for Preliminary Exploration (G3 Stage) of Limestone, Khatera, Yavatmal District, Maharashtra

	Months												
Item of work	**1**	**2**	**3**	**4**	**5**		**6**	**7**	**8**	**9**	**10**	**11**	**12**
Camp Setup													
Large Scale Mapping (1:4000													
Bed Rock Sampling													
Chemical analysis of surface samples													
Systematic drilling at 800x800 Grid													
Core sampling and its preparation													
Chemical analysis of Core Samples													
Processing of Analytical data													
Preparation of geologcial report													

REVIEW

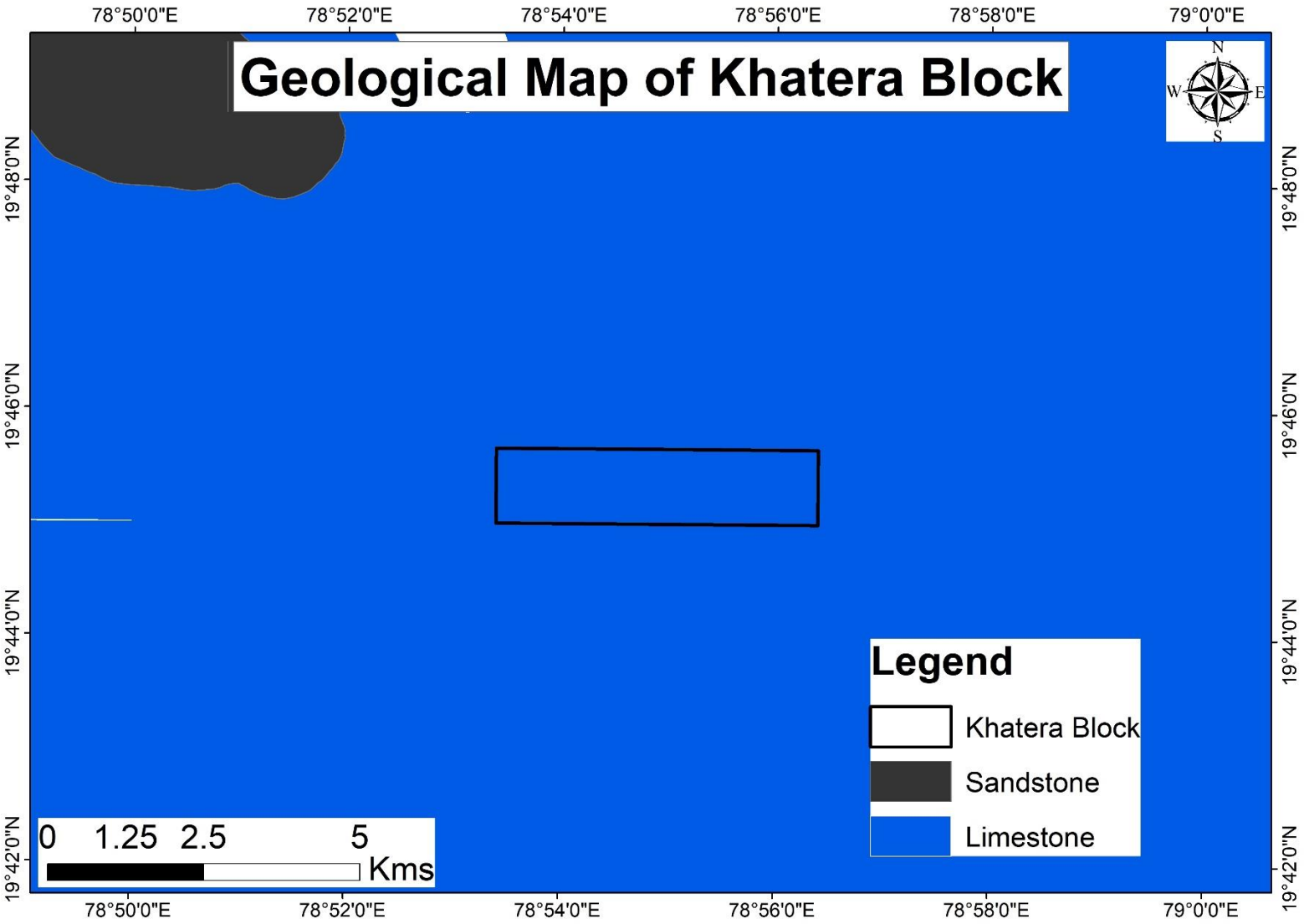

Plate 1 Proposed Khatera boundary over Geological map

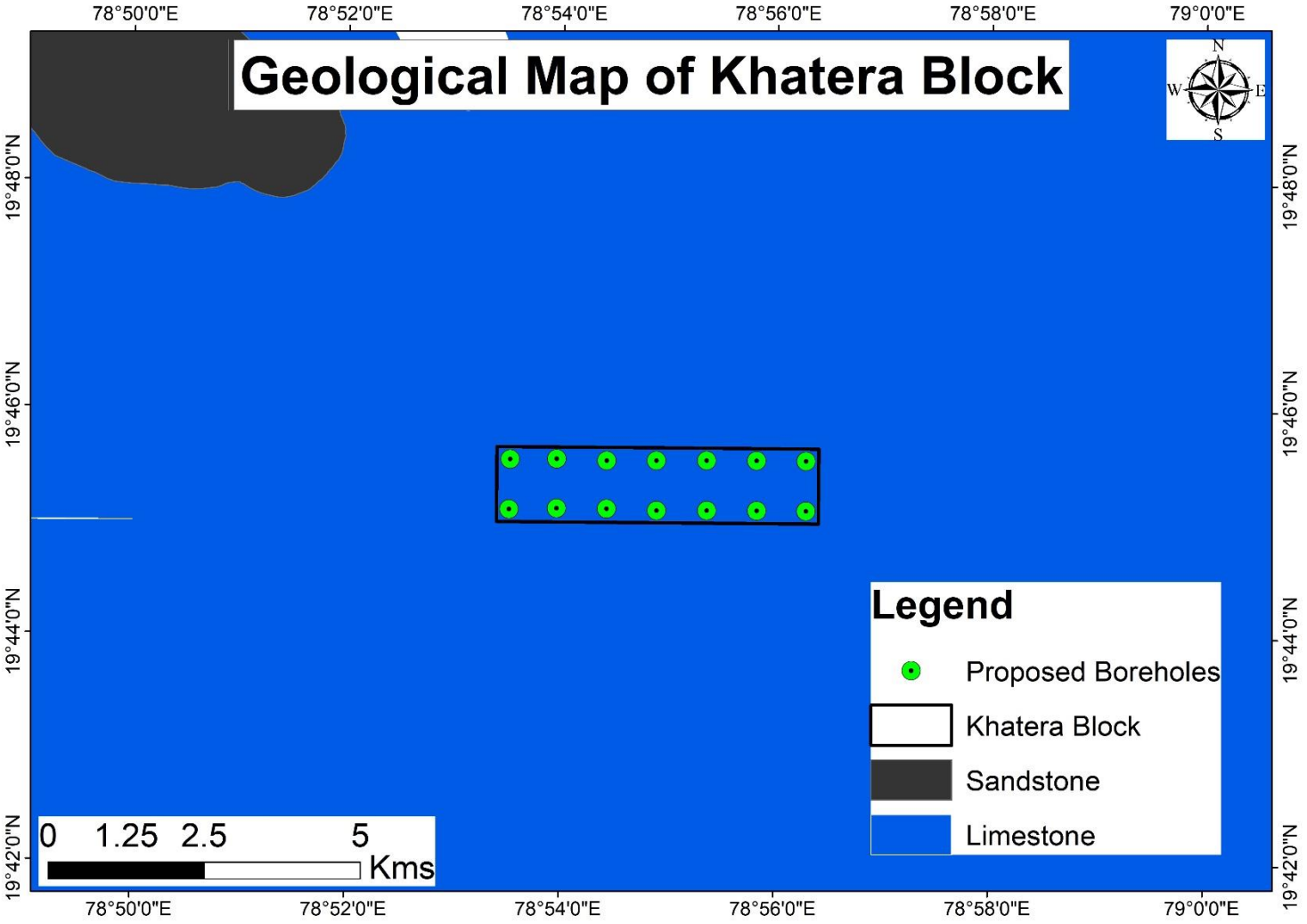

Plate 2 **Proposed Borehole point map**

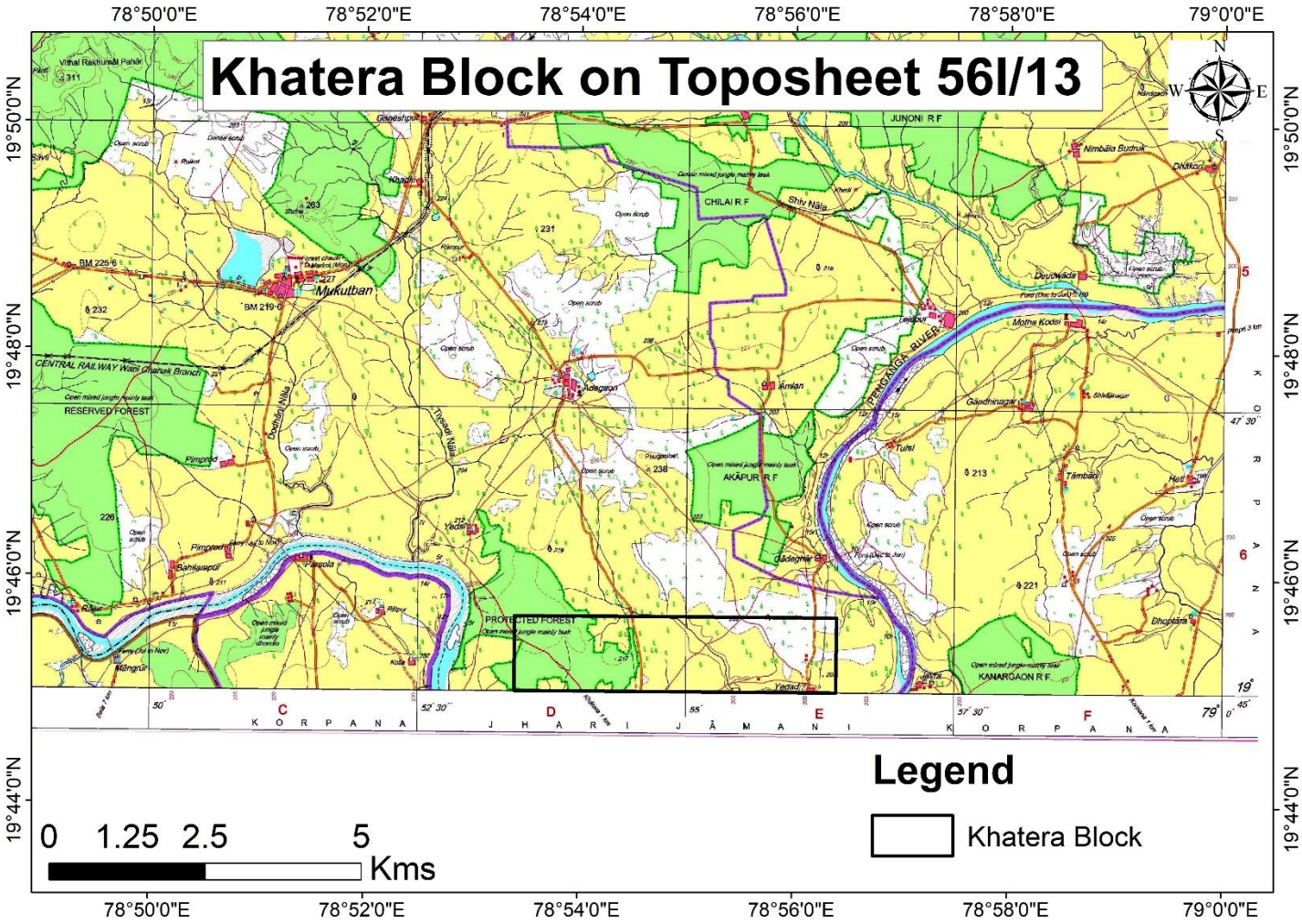

Plate 3 Proposed block boundary over Survey of India topographic map 56I/13 on 1:50,000.

List of Plates

Plate 1: Proposed Mangrur boundary over Geological map with BRS sample result..

Plate 2: Proposed Borehole point map

Plate 3: Proposed block boundary over Survey of India topographic map 56I/13 on 1:50,000.