Proposal for Glauconite and associated mineralization in and around Dhamni,, Piparwasi, Simliya area, Sheopur District, Madhya Pradesh, for Reconnaissance Survey (G4 Stage) under NMET.

Commodity: Glauconite

By

Maheshwari Mining Private Ltd.

Summary of the proposed Block for Reconnaissance Survey (G4 Stage) for glauconite in and around Dhamni, Piparwasi, Simliya area, Sheopur District, Madhya Pradesh

GENERAL INFORMATION ABOUT THE BLOCK

	Features	Details
	Block ID	Dhamni Piparwasi-Simliya Block
	Exploration Agency	Maheswari Mining Pvt. Ltd.
	Commodity	Glauconite
	Mineral Belt	Vindhyan Supergroup
	Completion Period with entire Time schedule to complete the project	12 months
	Objectives	1. To carry out Geological Mapping on 1:12,500 scale of the block (116 sq km) to assess various litho units using field equipments and mapping of glauconite bearing outcrops along with other lithounits. 2. To study different geological sections to build up local stratigraphy. 3. Classification of glauconite bearing sandstone of Govindgarh formation. 4. To carry out systematic grab/channel sampling of bed rocks. 5. Petrological studies of possible host rock and their chemical analysis. 6. Pitting-trenching of selected area and sampling. 7. Based on the outcome of surface geochemical sample results, and trenching/ pitting work total 10 nos. of scout boreholes will be drilled to assess the thickness of the glauconite bearing sandstone. 8. Attempt to delineate a glauconitic block.
	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 outsourced agency	Item will be executed by in house resource of Maheswari Mining Pvt. Ltd.
	Name/ Number of Geoscientists	In field: Two Geologists. At headquarters: Two Geologists.
	Expected Field days (Geology) Geological Party Days	1. Expected field days: 150 days each. In field: 300 party days for a party of 2 Geologists. 2. At Headquarters: 2 Geologists (210 days each)

1.	Location	
	Latitude	25° 52' 17.700" N to 25° 59' 26.590" N
	Longitude	77° 18' 48.981" E to 77° 24' 59.923" E
	Villages	Dhamni- Piparwasi-Simliya

	Tehsil/ Taluk	Vijaypur Tehsil
	District	Sheopuri district
	State	Madhya Pradesh
2.	**Area (hectares/ square kilometres)**	
	Block Area	116 sq km
	Forest Area	
	Government Land Area	
	Private Land Area	
3.	**Accessibility**	
	Nearest Rail Head	Sabalgarh Rly Station on Morena- Sabalgarh-Birpur North Central Railway track.
	Road	Vijaypur, a tehsil town in the northern part of the proposed area and connected by a fair-weather road up to Agra and Palpur villages. The area is also approachable from Shivpuri to Sasaipura village by an all weather road. Some villages in the area are connected by cart-tracks and foot-paths only.
	Airport	Gwalior 120 kms
4.	**Hydrography**	
	Local Surface Drainage Pattern (Channels)	All natural streams are flowing northerly or northwesterly.
	Rivers/ Streams	All northerly flowing streams join with Chambal Right Main Canal, which flows from west to ENE, along northern part of the area.
5.	**Climate**	
	Mean Annual Rainfall	The area has tropical monsoon climate, faces long spells of dry seasons with very low rainfall(100cm).
	Temperatures (December) (Minimum) Temperatures (June) (Maximum)	
6.	**Topography**	
	Toposheet Number	54F/8
	Morphology of the Area	Sabalgarh village is located in a valley to the northwest corner of the area. Villages Babupura, Jugopura and Nayagaon are located along a ENE-WSW valley.The southeast corner of the area shows a hilly tract.
7	**Availability of baseline geoscience data**	
	Geological Map (1:50K/ 25K)	1:50, 000 Scale Geological Map is available and was downloaded from GSI Portal (Bhukosh).
	Geochemical Map	Area is covered yet by National Geochemical Mapping (NGCM) and 1:50K Geochemical Map is available
	Geophysical Map (Aeromagnetic, ground geophysical, Regional as well as local scale GP maps)	Not Available
	Justification for taking up Reconnaissance Survey / Regional	1. Jadia and Srivastava (FS 1989-90, GSI), carried out Systematic Geological Mapping in parts of Morena district of Madhya Pradesh on 1: 50,000 scale in Survey

	Exploration	of India toposheet No. 54 G/1 & 5. The area in underlain by Vindhyan Supergroup of rocks comprising of Upper Rewa sandstone Formation of Rewa Group and Ganurgarh shales, Bhander limestone and Lower Bhander Sandstone Formation of Bhander Group. They observed thin bands of **glauconitic sandstone within the Upper Rewa Sandstone** in the nala sections west of Basantpura, in Kapeli nadi south of Kapel Hor and along Dham nadi southeast of Damni. This sandstone is fine-grained, light green coloured thinly bedded and moderately sorted with about **5-10% of glauconite** (Visual Estimate). They suggested in the present area, the Rewa Group has been deposited under marine conditions as indicated by the occurrence of glauconite within the sequence. The repetitive sequence of sandstone and shale indicates that depositional environment of this Group was fluctuating. 2. Srivastava and Mehrotra (FS 1989-90, GSI), carried out Systematic Geological Mapping of the Vindhyan Supergroup of rocks on 1:50,000 scale in parts of Shivpuri and Morena districts, M.P. falling in parts of Survey of India toposheets No. 54 G/5 and 54 G/9. As per their study Dudauni Member of Bila Formation of Kaimur Group is the oldest lithological unit exposed in the area. This lithounit is conformably overlain by Jhiri Formation and Upper Rewa Formation belonging to Rewa Group. As per their study Rewa sandstone exposed from Dhodha-Burera in the east (toposheet No. 54 G/9) to Bagwani-Piparwas-Surad-Magarda-Dubera in the west (toposheet No. 54 G/5). Total exposed thickness is about 200 m. This unit is constituted by massive to thickly bedded grayish white to pinkish white, coarse to medium grained sandstone containing few feldspars and **glauconite grains;** flaggy to thinly bedded, medium to fine grained, greenish white to dirty white **glauconitic sandstone** with intercalation of siltstone and thinly bedded olive green-coloured splintery shales. This study of thin sections reveals that sandstone of Upper Rewa Formation is composed of more than 90-95% quartz grains with subordinate amount of alkali feldspars (microcline, orthoclase) and rock fragments of chert and quartzite. Muscovite is also seen occasionally in few thin sections. **Glauconite** occurs as round and patchy disseminations and varying content. 3. National Geochemical Mapping (NGCM) has been carried out on 1:50000 scale in the part of Shivpuri and Morena districts, M.P. falling in the part Survey of India toposheets no. 54G/05. Geologically the study area is mainly comprising the rocks of the Vindhyan Supergroup of Mesoproterozoic to Late Neoproterozoic age. The study area is predominated by Rewa Group of rocks and Bhander Group of rocks and exposed in a small area of

		north-western part of the study area. As per their study glauconitic sandstone has been observed near Dubera, near Kopli nadi section, Kopli hor, Dham as well as glauconite has been observed near Agra along the Kunwari nadi bank. NGCM suggested K_2O value ranges from 1.45 % to 3.30 %. **4. The geologists of Maheshwari Mining Pvt. Ltd. visited the area twice and collected samples from glauconitic sandstone. In the first phase the analyses received for five samples. Out of five two samples analysed as 1.31 and 2.81% K_2O.In the second phase seven samples were collected. Out of seven samples four samples analysed as 1.15, 1.59,1.30 and 1.33% K_2O.** 5. In view of the above work and favourable geological set up the proposed area holds potential for glauconite mineralisation and the area is worth for taking up a G4 stage exploration to ascertain the potentiality of the prospect.

Proposal for Reconnaissance Survey (G4 Stage) for Glauconite in and around Dhamni, Piparwasi, Simliya area, Sheopur District, Madhya Pradesh.

Detailed description:

1. Block Summary

Physiography:

The topography of the proposed area is mainly controlled by lithology. The main topographic features are scarps and valleys. The scarps are formed by Lower Bhander Sandstone over the Ganurgarh Shale and Lower Bhander Limestone on both sides of Kuno river. The Bhander sandstone, in its upper most part, forms plateau like expanses, mainly in the western and northern parts of the area. At Durahat khoh, Lower Bhander Sandstone forms steep scarps having a vertical fall of more than 50m.

The general slope of the area is towards northwest and so is the drainage. The main rivers are Kuno and Kunwari. The main tributaries of these two rivers are Boka Khoh, Umrar nala, Koriya ka nala, Doninala, Banarai nadi, Dhan nadi and Kapeli nadi. In general, these rivers and their tributaries give rise to a dendritic drainage pattern in the area.

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

The proposed area of Sheopur district, Madhya Pradesh lies in parts of Toposheet No. 54G/05. Geologically, the area is represented by the thick sedimentary sequence of Vindhyan Supergroup of Meso-Proterozoic to Late Neoproterozoic age consisting dominantly of sandstone, shale and limestone. The rocks of the Vindhyan Supergroup are classified into Rewa Group and Bhander Group overlain by laterites of Cenozoic and alluvium of Quaternary.

GSI carried out systematic geological mapping of the Vindhyan Supergroup of rocks, on 1:50,000 scale in toposheet nos. 54G/6 & 7 in Shivpuri and Morena districts of Madhya Pradesh. According to them, the lithounit encountered in the area are represented by Dudauni Sandstone of the Kaimur Group, Jhiri Shale and Upper Rewa Sandstone of the Rewa Group and isolated laterite capping. The rock exhibits very low westerly dip of 3^{o} to 5^{o}. The sedimentological studies reveal that the Dudauni sandstone is a moderately matured quartz arenite with cross bedding and ripple marks, indicates shallow water deposit while the glauconite bearing Upper Rewa Sandstone showing vertical facies variation and being represented by mainly, matured quartz arenite in its lower part and frequent association of shale, silt stone and limestone in its upper part, indicate that its deposition started under shallow marine condition subsequently followed by intermittent shallowing and deepening of the basin resulting variation in lithounits. The Petrographic studies reveal that the sediments were derived from granitic and subsidiary metamorphic and sedimentary provenance.

The present area is the northward extension of the area mapped by Ramteke & Chellani (1988-89). Hence the same stratigraphic nomenclature has been adopted by the authors in the present report for the rocks encountered. The mapped area comprises of Rewa and Bhander Groups of rocks belonging to Vindhyan Supergroup. All the formations as mapped by Ramteke & Chellani (1988-89) are encountered in the present area.

During the field season 1989-90 an area of about 702 sq km was systematically mapped on 1:50,000 scale in parts of toposheet Nos.54 G/5 & 54 G/9, falling in parts of Shivpuri and Morena districts, M.P. The present area is northern continuation of the area already covered in previous field season by Chhatri & Tripathi (1989) and Jain & Dhar (1988). The Vindhyan Supergroup of rocks are represented here by Dudauni Member of Bila Formation of Kaimur Group and Jhiri Formation and Upper Rewa

formation of Rewa Group. The authors have maintained the stratigraphic sequence as established by the workers in the recent years. All lithological contacts are normal and conformable and do not show any major folding and faulting in the present area of mapping.

The stratigraphic succession of the area established is as given below:

	Group	Formation	Lithology
VINDHYAN SUPERGROUP	Recent/Quaternary		Alluvium/soil/laterite
	Rewa Group	Upper Formation	Massive to thinly bedded sandstone, glauconite bearing at places and with interbands of siltstone, shale and occasional lensoidal bodies of impure limestones
		Jhiri Formation	Olive green to khaki green/reddish brown to chocolate brown coloured splintery shale with interbands of ferruginous sandstone/stiltstone
	----------Conformable sharp to gradational contact----------		
	Kaimur Group	Bila Formation	Dudauni Member White to dirty white, massive to thinly bedded sandstone with interbands of siltstone.
	--- BASE NOT SEEN ---		

Mineral potentiality based on geology, geophysics, ground geochemistry etc.:

Jadia and Srivastava (FS 1989-90, GSI), carried out systematic geological mapping in parts of Morena district of Madhya Pradesh on 1: 50,000 scale in Survey of India toposheet No. 54 G/1 & 5. The area in underlain by Vindhyan Supergroup of rocks comprising of Upper Rewa sandstone Formation of Rewa Group and Ganurgarh shales, Bhander limestone and Lower Bhander Sandstone Formation of Bhander Group. They observed thin bands of glauconitic sandstone within the Upper Rewa Sandstone have been observed in the nala sections west of Basantpura, in Kapeli nadi south of Kapel Hor and along Dham nadi southeast of Damni. This sandstone is fine-grained, light green coloured thinly bedded and moderately sorted with about 5-10% of glauconite (Visual Estimate). They suggested in the present area, the Rewa Group has been deposited under marine conditions as indicated by the occurrence of glauconite within the sequence. The repetitive sequence of sandstone and shale indicates that depositional environment of this Group was fluctuating.

Srivastava and Mehrotra (FS 1989-90, GSI), carried out Systematic geological mapping of the Vindhyan Supergroup of rocks on 1:50,000 scale in parts of Shivpuri and Morena districts, M.P. falling in parts of Survey of India toposheets No. 54 G/5 and 54 G/9. As per their study Dudauni Member of Bila Formation of Kaimur Group is the oldest lithological unit exposed in the area. This lithounit is conformably overlain by Jhiri Formation and Upper Rewa Formation belonging to Rewa Group. As per their study Rewa sandstone exposed from Dhodha-Burera in the east (toposheet No. 54 G/9) to Bagwani-Piparwas-Surad-Magarda-Dubera in the west (toposheet No. 54 G/5). Total exposed thickness is about 200 m. This unit is constituted by massive to thickly bedded grayish white to pinkish white, coarse to medium grained sandstone containing few feldspars and glauconite grains; flaggy to thinly bedded, medium to fine grained, greenish white to dirty white glauconitic sandstone with intercalation of siltstone and thinly bedded olive green-coloured splintery shales. This study of thin sections reveals that sandstone of Upper Rewa Formation is composed of more than 90-95% quartz grains with subordinate amount of alkali feldspars (microcline, orthoclase) and rock fragments of chert and quartzite. Muscovite is also seen occasionally in few thin sections. Glauconite occurs as round and patchy disseminations and varies in the content.

National Geochemical Mapping (NGCM) has been carried out on 1:50000 scale in the part of Shivpuri and Morena districts, M.P. falling in the part Survey of India toposheets no. 54G/05. Geologically the study area is mainly comprising the rocks of the Vindhyan Supergroup of Mesoproterozoic to Late Neoproterozoic age. The study area is predominated by Rewa Group of rocks and Bhander Group of rocks and exposed in small area of north-western part of the study area. As per their study glauconitic sandstone has been observed near Dubera, near Kopli nadi section, Kopli hor, Dham as well as glauconite has been observed near Agra along the Kunwari nadi bank. NGCM suggested K2O value ranges from 1.45 % to 3.30 %.

In view of the above observations it is understood that the proposed area holds potential for glauconite mineralisation and the area is worth to be taken up at G4 stage exploration to ascertain the potentiality of the prospect.

Scope for proposed exploration:

The Reconnaissance survey at G-4 stage exploration program has been formulated to target glauconite and associated mineralisation in the entire 116 sq. km of Dhamni Piparwasi-Simliya Block. The proposed scheme of exploration comprises Geological mapping (1:12500 scale), surface geochemical sampling, trenching/ pitting work and followed by core drilling of 5 nos. scout boreholes (150m drilling) to assess the thickness of the glauconite bearing sandstone.

Objectives:

1) To carry out Geological Mapping on 1:12,500 scale of the block (116 Sq. Km) to assess various litho units using field equipments and mapping of glauconite bearing outcrops along with other lithounits.
2) To study different geological sections to build up local stratigraphy.
3) Classification of glauconite bearing sandstone of Govindgarh formation.
4) To carry out systematic grab/channel sampling of bed rocks.
5) Petrological studies of possible host rock and their chemical analysis.
6) Pitting-trenching of selected area and sampling.
7) Based on the outcome of surface geochemical sample results, and trenching/ pitting work total 5 nos of scout boreholes shall be drilled to assess the thickness of the glauconite bearing sandstone,
8) Attempt to delineate a glauconitic block or more than one block to upgrade the investigation in G3 stage.

2. Previous Work

(Previous Exploration in adjoining area (Regional area); All the sample (bed rock/trench/ groove/soil), borehole location should be plotted on the geological map and analytical data should be discussed briefly

Previous Exploration in the proposed block area: All the sample (bed rock/trench/ groove/soil), borehole location should be plotted on the geological map and analytical data should be discussed briefly).

Available information discussed under previous point.

3. Block description

Points	X	Y
A	77° 18' 48.981" E	25° 59' 16.852" N
B	77° 24' 59.923" E	25° 59' 26.590" N
C	77° 24' 59.898" E	25° 53' 39.706" N
D	77° 19' 29.231" E	25° 52' 17.700" N

4. Planned Methodology: G4 stage guideline of MEMC Rule will be followed.

5. Nature Quantum and Target

Nature and Quantum of work proposed

Components	G4 Stage
Aerial reconnaissance	Nil
Geological Survey	i) 1: 12,500 scale for 116 sq km area. ii) To assess various litho units using field equipments and mapping of glauconite bearing outcrops along with other lithounits.
Geochemical Survey	Regional Grab / chip sampling from surface and escarpments: 200 nos.
Pitting	100 cu m pitting. Pit samples: 100 nos.
Scout drilling / Systematic drilling	5 boreholes if required with a total of 150m.
Core sample	100 borehole core samples from glauconitic sandstone.
Petrographic and mineragraphic studies	10 PS+10 PCS) representative samples from all bed rocks to carry out petrographic studies (PS) and petrochemistry (PCS).
Synthesis of all available data	i) Integration of regional geological and geochemical data. ii)Synthesis of all available data and Report writing

5 & 6. Manpower deployment and break up of expenditure for glauconite and associated mineralization in and around Dhamni,, Piparwasi, Simliya area, Sheopur District, Madhya Pradesh (G4 stage)

Estimated cost for Glauconite and associated mineralization in and around Dhamni,, Piparwasi, Simliya area, Sheopur District, Madhya Pradesh. (G4 stage) **Period of completion : 12 months**							
Sl. Nos.	**Item of work**	**Unit**	**Rates as per NMET SoC 2020-21**		**Estimated Cost of the Proposal**		
			SoC-Item-Sl No	**3**	**Qty.**	**Total**	**Remark s**
1	**Geological Mapping (on 1:12,500) (116 sq km)**						
	(a) Charges for 2 Geologists in field (without labourer)	**per day per Geologist**	**1.2.b**	**11000**	**300**	**3300000**	
	(b) Charges for 2 Geologists at Headquarters	**per day per Geologist**	**1.2.a**	**9000**	**120**	**1080000**	
	(c) Wages for 4 labourers in Field	**per day (appxly)**	**5.7**	**500**	**600**	**300000**	

	(d) Charges for demarcation of block boundary, fixation of BH & determination coordinates & RLs by DGPS	**per point observation**	**1.6.2**	**19200**	**5**	**96000**	
	(e) Charges of Surveyor	**per day**	**1.6.1a**	**8300**	**10**	**83000**	
	(f) Wages of 2 labours for survey work	**per day (appxly)**	**5.7**	**500**	**20**	**10000**	
2	**Geochemical sampling**						
	(a) Bedrock sampling				**200nos.**		
3	**Technological Survey**						
	(a) Pitting	**per cu m**	**2.1.2**	**3300**	**100**	**330000**	
	(b) Drilling	**per m**	**2.2.1.1b**	**5242**	**150**	**786300**	
	(c) Borehole Pillaring (construction of concrete pillar) 12 inches x12 inches x 30 inches	**per borehole**	**2.2.7a**	**2000**	**5**	**10000**	
	(d) Transportation of Drill Rig and truck(to and from Headquarters or Previous drill site)	**per km**	**2.2.8**	**36**	**1288**	**46368**	
	(e) Drilling camp setting cost	**per drill**	**2.2.9a**	**250000**	**1**	**250000**	
	(f) Drilling camp winding cost	**per drill**	**2.2.9b**	**250000**	**1**	**250000**	
	(g) Monthly accommodation charges for drilling camp	**per month**	**2.2.9**	**50000**	**3**	**150000**	
	(h) Approach road making to drill site	**per km**	**2.2.10a**	**22020**	**5**	**110100**	
1.	**Laboratory Studies**						
	(a) Complete analysis of major oxides samples	**per sample**	**4.1.9**	**2900**	**400**	**1160000**	
	(b) Analyses of major oxides by XRF	**per sample**	**4.1.15a**	**4200**	**10**	**42000**	
2.	**Petrographic studies**						
	(a) Preparation of thin sections	**per sample**	**4.3.1**	**2353**	**10**	**23530**	
	(b) Study of thin sections	**per sample**	**4.3.4**	**4232**	**10**	**42320**	
3.	**Bulk Density/specic gravity Determination**	**per sample**	**4.8.1**	**1605**	**3**	**4815**	
4.	**Drill core preservation**	**per m**	**5.3**	**1590**	**150**	**238500**	

5.	**Geological Report preparation (5 hard copies with a soft copy)**		**5.2**	**As the exploration cost is exceeding 150 lakhs but less than 300 lakhs.**		**750000**	
6	**Peer Review**	**Lumpsum**	**as per EC decision**	**30000**	**1**	**30000**	
7	**Preparation of exploration proposal (5 hard copies with a soft copy)**		**5.1**	**2% of approved project cost or 3.8 lakh, whichever is lower**		**329607**	
	Grand Total of estimated cost(without GST):					**9422540**	
	18% GST					**1696057**	
	GRAND TOTAL INCLUSIVE OF TAXES:					**11118597**	
Total: Rupees One crore eleven lakhs seventy eighteen thousand five hundred ninety seven							

7. References:

1. Jadia, S.K. & S.K. Shrivastava, (1989-90): A Report on Systematic Geological Mapping in Parts of Morena District, Madhya Pradesh, Unpublished GSI Report.
2. Shrivastava, M.P. & R.D. Mehrotra, (1989-90): A progress report on the Systematic Geological Mapping in parts of Shivpuri and Morena Districts, Madhya Pradesh, Unpublished GSI Report.

List of Plates

Plate I: Proposed block boundary over toposheet no 54G/05 map on 1:50,000.

Plate II: Proposed block boundary over Geological map on 1:50,000.

Plate III: Proposed block boundary over Geological map with contour of K_2O (%)on 1:50,000.

Plate IV: Proposed block boundary over Geological map by Jadia and Srivastava (FS 1989-90, GSI) on 1:50,000.

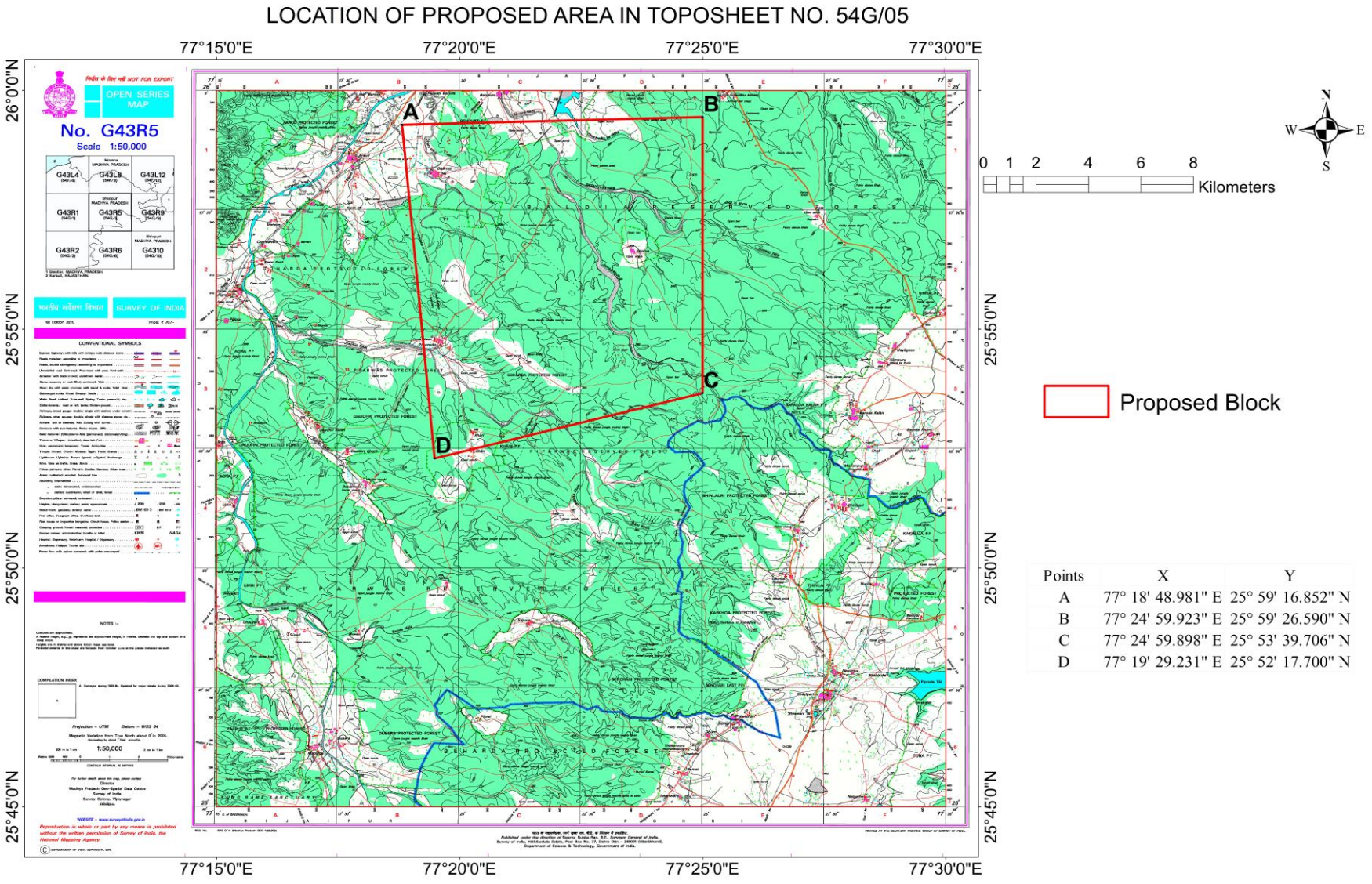

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Plate I: Proposed block boundary over toposheet no 54G/05 map on 1:50,000.

GEOLOGICAL MAP OF TOPOSHEET NO. 54G/05 SHOWING PROPOSED AREA

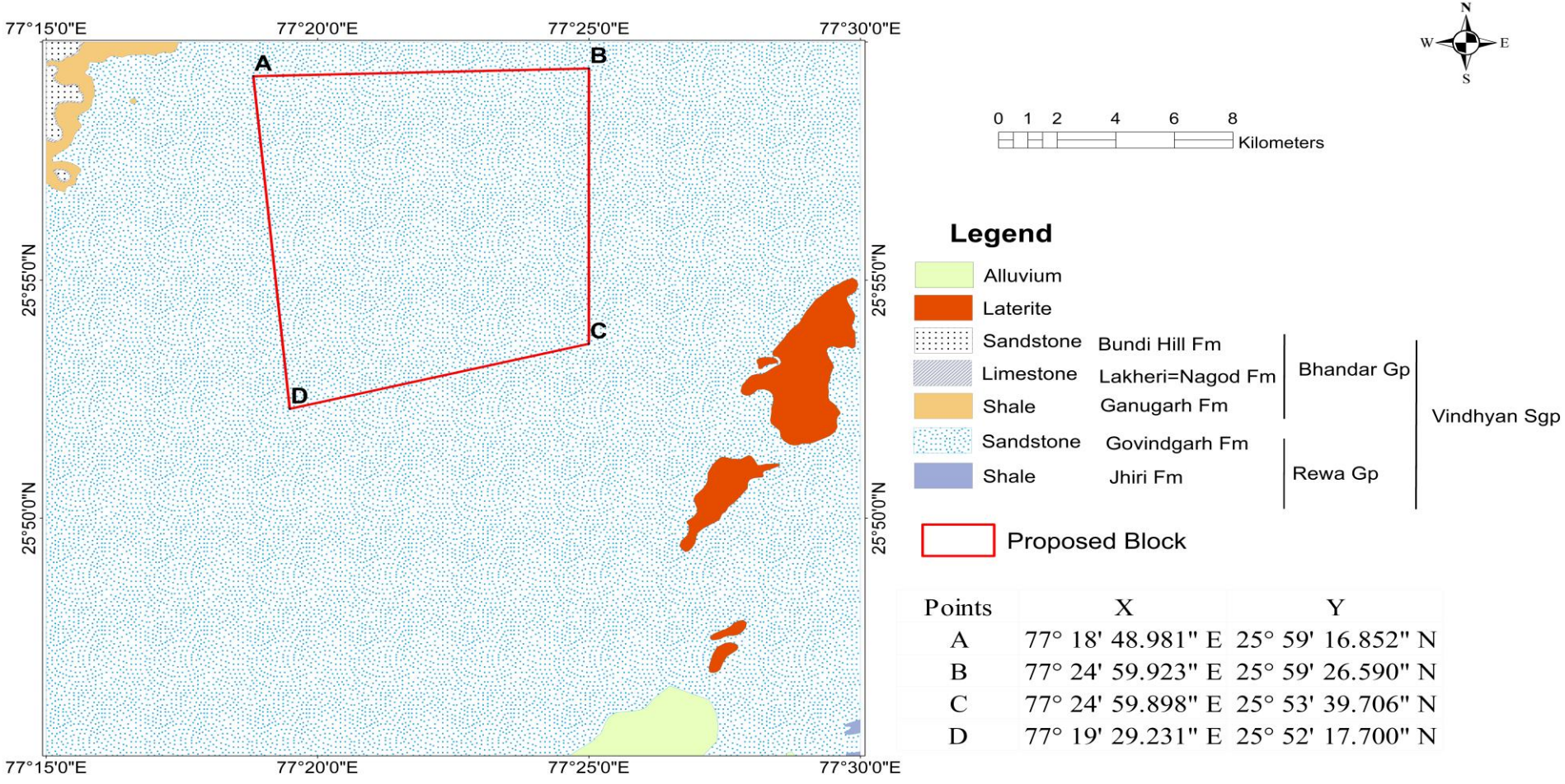

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Plate II: Proposed block boundary over Geological map on 1:50,000.

GEOLOGICAL MAP OF TOPOSHEET NO. 54G/05 SHOWING PROPOSED AREA WITH K2O (%) CONTOUR

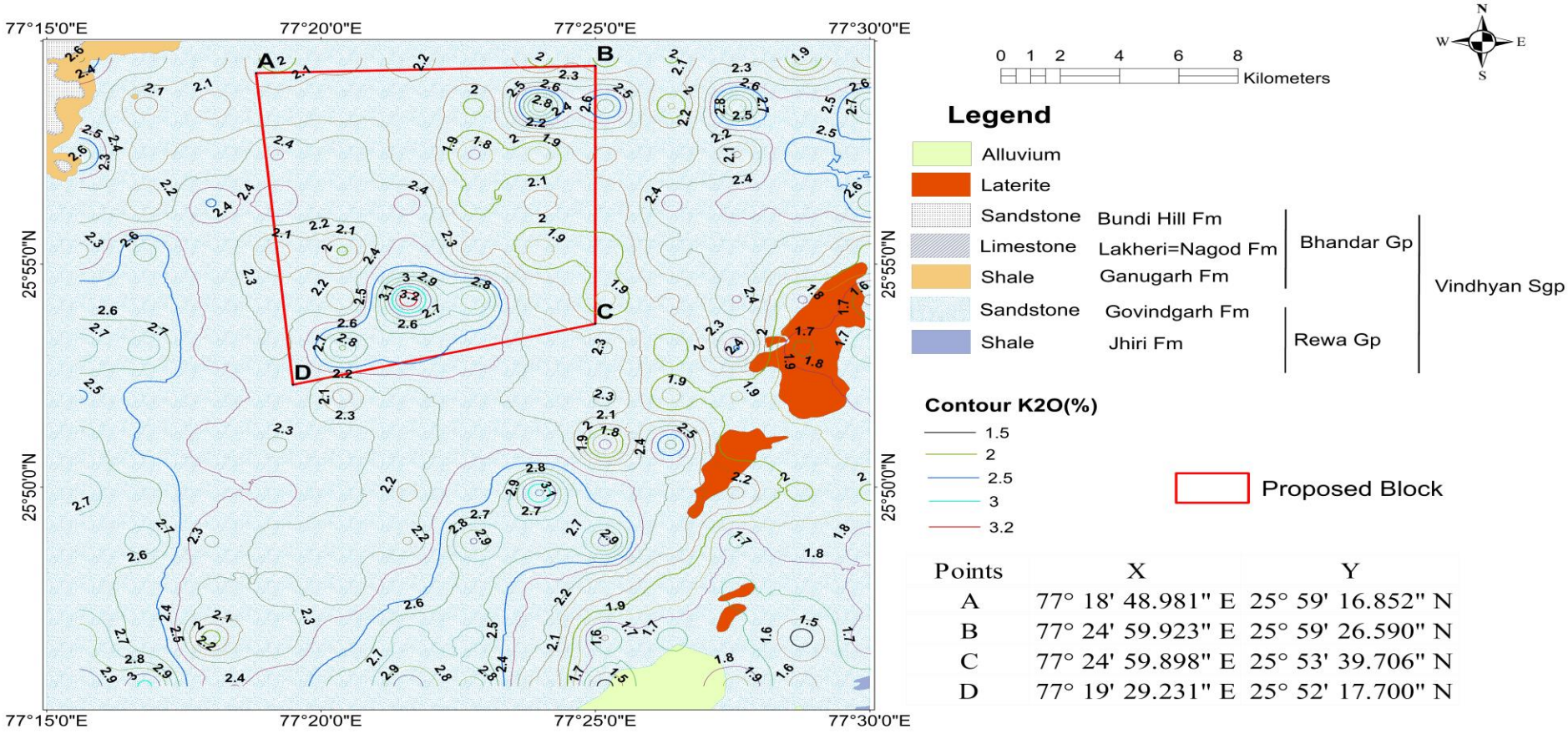

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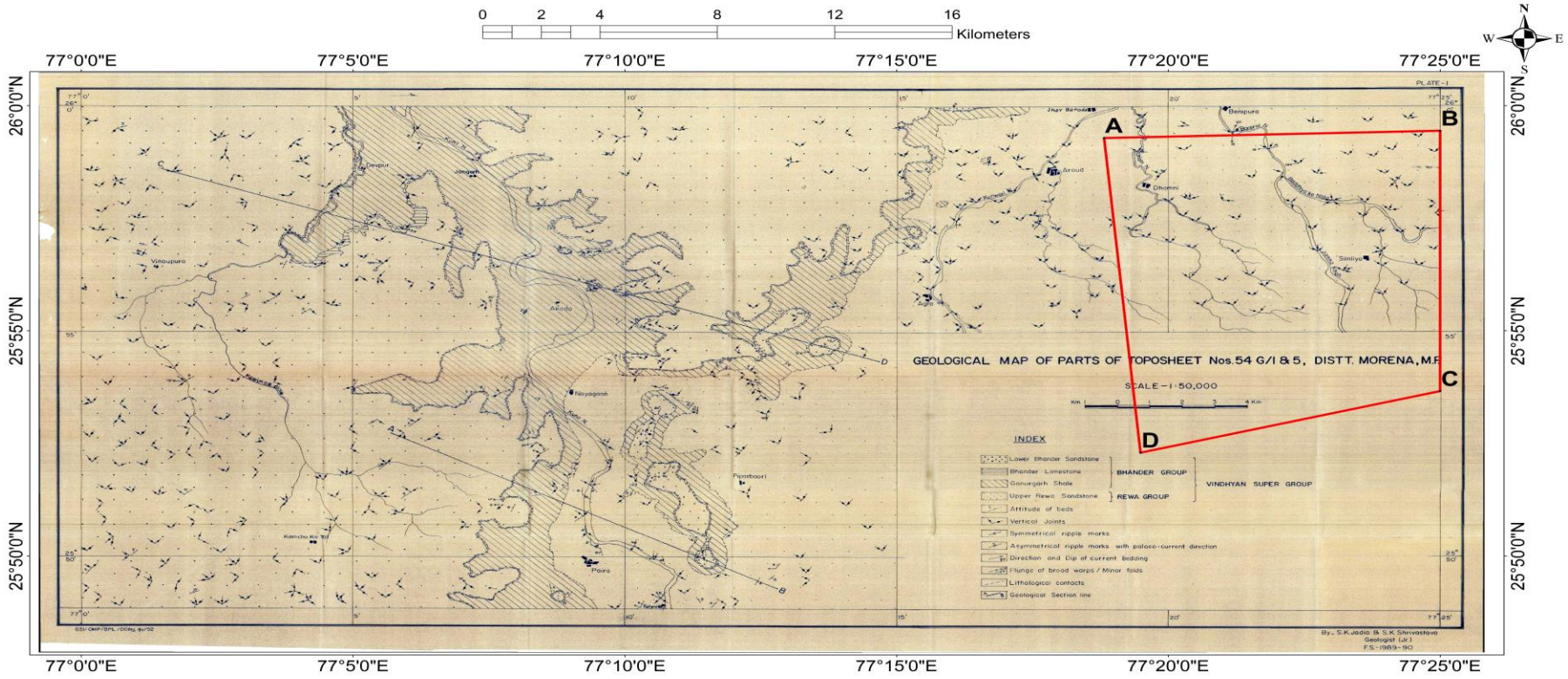
Plate III: Proposed block boundary over Geological map with contour of K_2O (%) on 1:50,000.



Proposed Block

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