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INFRAPROJECTS PVT. LTD.

Ref.No : PRBIPPL/NMET/DPR/24-25/0702

Date : 12.01.2025

To,
The Director & HOD
National Mineral Exploration Trust
Ministry Of Mines
F-114, Shastri Bhavan
NEW-DELHI-110001

Subject : Submission of Detailed Proposal for Reconnaissance Survey (G4 Stage) for Bhatiya Limestone Block in District-Devbhumi Dwarka State Gujarat.

Respected Sir,

As per the in principle approval for the subject block in 4th TCC-II meeting held on 26th & 27th December-2024, we are please to submit the Detailed proposal for reconnaissance survey (G4 Stage) for Bhatiya Limestone Block (10.00 Sq Km) in Dist-Devbhumi Dwarka, State-Gujarat for your kind consideration and approval please in the upcoming 5th TCC-II meeting to be held on 26th & 27th January-2025

Thanking You

For PRB Infraprojects Private Limited

FOR PRB INFRAPROJECTS PVT.LTD.

(DIRECTOR)

(Managing Director)



MINERAL EXPLORATION PROJECT PROPOSAL
FOR
RECONNAISSANCE SURVEY (G4) FOR LIMESTONE IN BHATIYA AREA
IN THE VILLAGE BHATIYA-GOKALPUR, DISTRICT- DEVBHUMI
DWARKA, STATE - GUJARAT

(10.00 SQ, KMS)

UNDER NMET
(T.S.No.41F/04 & 41F/08)
Commodity-LIMESTONE
(Industrial Mineral)



(Date of Submission: 12th Jan 2025)

Submitted by:

PRB INFRAPROJECTS PVT.LTD.
S-3, 2nd Floor Ratan Heights
Medical Square, Untkhana Road
NAGPUR- 440024.

To,

THE DIRECTOR AND HOD
National Mineral Exploration Trust
Ministry Of Mines
NEW-DELHI-110001



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Summary of the Block for G4 stage exploration

	Features	Details
	Block ID	Bhatiya Limestone Block
	Current Exploration Agency	PRB Infraprojects Pvt Ltd
	Previous Exploration Agency	Commissioner of Geology and Mining (CGM), Gujarat
	Previous Geological Exploration Report	➤ The Commissioner of Geology and Mining (CGM), Gujarat has carried out geological exploration working this block (1997-98) & (2010-11) .
	Commodity	Limestone
	Mineral Belt	Gaj Formation
	Completion Period with entire Time Schedule to complete the project	12Months
	Objectives	<ol style="list-style-type: none"> 1. Geological mapping in 1:12500 scale to delineate the surface outcrops of Limestone. 2. Systematic collection of Bed Rock samples and analysis. 3. To drill 3 Nos. of Scout boreholes as per MEMC rules 2015 (Being irregular nature of the deposit) to decipher depth persistence and subsurface continuity of bedded deposits. 4. To estimate the in situ resource of Limestone for G4 stage of exploration and preparation of Geological Report (GR). 5. Carry out mineral exploration works as per Minerals (Evidence of Mineral Contents) Rule-2015, Mineral (Auction) Rules-2015 and MMDR Amendment act-2015. In turn to facilitate the Government of Gujarat in auctioning of the 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 outsource agency	Entire work shall be Carried out by M/s PRB Infraprojects Pvt. Ltd. (In house)
	Name/Number of Geoscientists	Two Geologist (2G) & Surveyor (1)
	Expected Field days (Geology, Geophysics, Surveyor)	a. Geologist:210, Field Days+60 HQ Days b. Surveyor:10 Days
1.	Location	
	Latitude	Between 22°5'24.98"N & 22° 3'74.01"N
	Longitude	Between 69°14'14.51"E & 69°16'36.72"E
	Villages	Bhatiya-Gokalpur
	Tehsil / Taluk	Kalyanpur
	District	Devbhumi Dwarka
	State	Gujarat



2.	Area(hectares/square kilometers)	
	Block Area	10.00 sq.km
	Forest Area	--
	Government Land Area	--
	Private Land Area	--
3.	Accessibility	
	Nearest Rail Head	Bhatiya railway station – 10.6 km
	Road	NH51- adjacent to the block area
	Airport	Porbandar Airport – 50km
4.	Hydrography	
	Local Surface Drainage Pattern (Channels)	The drainage pattern is sub-dendritic in nature
	Rivers / Streams	No perennial river/streams present in the proposed block area
5.	Climate	
	Mean Annual Rainfall	1002mm
	Temperatures (December)(Minimum)	Minimum-7 ⁰ C
	Temperatures (June) (Maximum)	Maximum-44 ⁰ C
6.	Topography	
	Toposheet Number	41F/04 and 41F/08
	Morphology of the Area	The area consists of low lying coastal plain varying in elevation from 21m to 33m above mean sea level, followed by gently undulating with small hillock terrain.
7.	Availability of baseline geosciences data	
	Geological Map(1:50K)	Attached (refer PlateNo.-IV)
	Geochemical Map	Available
	Geophysical Map(Aerogeophysical, Ground geophysical, Regional as well as local scale GP maps)	Available
8.	Justification for taking up G4stage mineral exploration	<p>The NOC has been given by CGM Gujarat. The area comprises of Limestone of Gaj Formation, which is reported to be of cement grade. Several leases for limestone mining occur in the vicinity of proposed block which is suggestive of high potentiality of the block.</p> <p>GSI has carried out quaternary geological mapping in the parts of Saurashtra area in the FS 1971-72 and has reported occurrence of high-grade limestones in the Gaj Formation. (Report by K.K. Verma and U.B. Mathur)</p> <p>Recently in 4th TCC-II meeting in principle application was approved and the TCC was suggested for submission of DPR, proposing Geological mapping in 1:12500 scale, sampling and Few scout bore holes.</p>



DETAILED DESCRIPTION OF THE PROJECT

1. Block Summary

Physiography

The proposed block area is in the Kalyanpur Taluka, Devbhumi Dwarka district in the western part of Gujarat. The area is characterized by flat, undulating topography with very few mounds and parallel ridges. There are no perennial rivers present in the block. The area is usually dry the whole year except during monsoon when few seasonal streams flow which forms sub-dendritic drainage pattern. Moreover, the topography of the whole area is flat with some undulations. The highest elevation is 33m and lowest is 21m above msl.

Geological Background of the area

Regional Geology

The Tertiary rocks were deposited in shallow marine to beach environment and is represented by rocks of the Gaj Formation and the Dwarka Formation (Lower Miocene to Pliocene). The rocks of Dwarka Formation are well exposed around Kalyanpur and Dwarka, the Gaj Formation is seen around Kalyanpur and Jodhpur area. The Milliolite Formation occurs along the sea-coast.

The general stratigraphic succession of the region is as follows:

Age	Formation	Lithounits
Pleistocene to Holocene	Recent to sub recent	Alluvium / Soil, clay, mud
Lower Miocene	Gaj Formation	Yellowish to cream coloured clayey Limestone. Hard, fine grained calcareous clay and Mar
	Deccan Trap.....	

Geology of the Block

The stratigraphic sequence of the proposed block area is as follows: The uppermost formation in the block is of alluvium/soil which varies in colour from blackish to brownish red

Limestone:

The limestone found in the block belongs to Gaj formation of Lower Miocene age. Freshly broken limestone is yellowish and brownish in colour. Generally, it is medium grained but at some places it is courser in grain size and contains fossilized fragments and occasionally sand grains. At some places it is highly compact in nature. Fractured limestone is also observed. The thickness of the limestone varies in different part of the block.

Clay:

Clay found in the block also belongs to Gaj formation. The clay is brownish, greyish, greenish, and yellowish in colour. It is called variegated clay. It is soft and fine to coarse grained. At places, it is intermixed with gritty material and contains gypsum. At some places calcareous and carbonaceous clay is also found in this area.

Deccan Trap:

Trap found in block is mostly blackish in colour. It is generally fine to medium grain in nature. It is hard and compact. Fractured and weathered trap is found at some places in block. These trap rocks are commonly in form of varying thickness.

Mineralization potential of Limestone

CGM was carried out exploration by drilling in Jodhpur village in FS.2018-19, on a grid of 200 meters, 13 boreholes were drilled and limestone was found to be encountered in each borehole.



Detailed survey for Limestone of Okhamandal Taluka of Jamnagar district was also carried out by CGM in FS 2010-11 and it was noted that the limestone deposit found in the area is of bedded type which adds up to potential of limestone occurring in the proposed block area. Besides, the limestone upto cement grade is reported to be present in the area as per the analysis of the samples. Several existing mines of bauxite and limestone are present surrounding the proposed block which adds up to evidence of mineral potentiality and need for further exploration in the area. GSI has carried out work on geological mapping in FS 1971-72. and reported occurrence of high-grade limestones in the Gaj Formation. Chemical analysis is CaO – 41% to 50%, MgO – 1.1% to 6%, SiO₂ < 10%.

Scope for proposed exploration

Sr. No.	Nature of Work	Proposed Work
1	Detailed Mapping in 1:12500 scale	10.00 sq. km
2	Bed Rock Samples	60
3	Specific Gravity Determinations	5 no
4	Sample Analysis (Bed rock samples)	60
5	Core Drilling	120 m
6	Borehole Depth	40m
7	Drill Core Samples	90 Nos
8	Category of Land	--
9	Geological Personnel	02Nos.
10	Period of Scheme	12 months

Recommendations of Detailed Mineral Exploration Report by CGM, Gujarat:

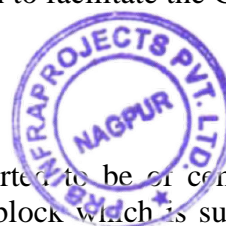
Based on the exploration by CGM the block was put up for G4 for further exploration but due to lack of some important information it could not be auctioned. Thereafter, CGM, Gujarat conducted a workshop and expressed interest for certain blocks for exploration. CGM, Gujarat was granted NOC of few blocks to PRB Infraprojects Pvt. Ltd., Nagpur and take up for G4 stage of exploration under NMET to put up this block for auction as ML.

Objectives:

- To delineate the surface outcrop of minerals body both along the strike and dip direction by geological mapping in 1:12500 scale and collection of bed rock samples and analysis.
- To drill Three scout boreholes on definite pattern as per MEMC rules 2015 (Being bedded form of occurrence of the deposit) to decipher its depth persistence and subsurface continuity and to establish the different zones of limestone grade.
- To estimate the in-situ resources of different grade of limestone and preparation of Geological Report (GR).
- Carry out mineral exploration works as per Minerals (Evidence of Mineral Contents) Rule-2015, Mineral (Auction) Rules-2015 and MMDR Amendment act-2015. In turn to facilitate the Government of Gujarat in auctioning of the block.

2. Previous Work

- The area comprises of Limestone of Gaj Formation, which is reported to be of cement grade. Several leases for limestone mining occur in the vicinity of proposed block which is suggestive of high potentiality of the block.



- GSI has carried out quaternary geological mapping in the parts of Saurashtra area in the FS 1971-72 and has reported occurrence of high-grade limestones in the Gaj Formation. Report by K.K. Verma and U.B. Mathur.
- GSI has carried out work on delineation of Cement and Chemical grade Limestone in Okha Mandal taluka, Jamnagar District, Gujarat. FSP 1994-95 by P. Gandhi & J. Prasad. Part of TS. 41F/03 & 41F/04.
- CGM Gujarat was carried out exploration by drilling in Jodhpur village in FS.2018-19, on a grid of 200 meters, 13 boreholes were drilled and limestone was found to be encountered in each borehole. Detailed survey for Limestone of Okhamandal Taluka of Jamnagar district was also carried out by CGM in FS 2010-11 and it was noted that the limestone deposit found in the area is of bedded type which adds up to potential of limestone occurring in the proposed block area.

3. Block description

Sr. No.	Block Corner Point	Latitude	Longitude
1.	A	22° 5'26.70"N	69°14'13.93"E
2.	B	22° 5'40.76"N	69°15'43.88"E
3.	C	22° 4'46.36"N	69°15'37.99"E
4.	D	22° 3'44.01"N	69°16'37.41"E
5	E	22° 3'18.46"N	69°14'43.97"E

4. Proposed/ Planned Methodology

Detailed Geological Mapping

Geological mapping on 1:12500 scale will be carried out in an area of 10.00 sq. kms. by taking traverses with the help of GPS. The geological map will be prepared by adding geological features and structural details etc. picked up during field mapping.

Drilling

To interpret the lithological contacts from the borehole data between various lithologies. A total 3 Nos. scout boreholes shall be drilled with an average depth of 40 m. deep. A total cumulative drilling meterage shall be 120m initially in the proposed block.

Core Logging and Sampling

The core recovered from the exploratory drilling shall be kept in the core boxes as per the standard procedure. In the log book core recovery, core recovery percentage, unit length, extra polated length run-wise shall be recorded. Borehole cores shall be logged run-wise as per litho units, structural features, and rock types. Samples for each borehole shall be collected and prepared further for chemical analysis.

Chemical Analysis

The collected samples shall be analyzed by XRF for 6 radicals like CaO, MgO, Al₂O₃, SiO₂, Fe₂O₃ and LOI etc. 10% of the primary samples shall be analyzed as check samples.

ICP-OES/ICP-MS (sequential technique) Sample package for 34 elements i.e. 16 other elements Viz. Li, Ga, In, Be, Ge, Mo, Cr, Ta, W, Ba, Co, Rb, Sr, Zr, Nb, Ni: 18 REE viz. La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Sc, Y: 02 Actinides viz. U, Th of 10 samples (Per BH 2 Sample).

Geotechnical study: 5Nos. of Limestone samples will be collected for Specific Gravity Determinations .

Geological Report

Prepare a detailed report (Final G4 stage report) along with geological map identifying and establishing the deposit with quality and quantity of the resources with worthy of being raised to a G2 scheme of exploration as per MEMC-2015. Data generated from G-3 level of work and



earlier data if any shall be presented in the report as per the guidelines laid down in provisions of Mineral (Evidence of Content) Rules 2015 in the NMET prescribed format for pre review.

5. Nature and Quantum of the work

G4 stage GR should be submitted for G3 stage proposal and G3 stage GR for G2 proposal details of the previous stage of exploration

Sr. No.	Item of Work	Unit	Proposed Quantum
1.	Geological Mapping (1:12500)	Sq. Kms	10.00
2.	Core Drilling	M	120 (3 Scout BHs)
3.	Sample preparation and Laboratory Studies		150
	Chemical Analysis		
A.	Chemical Analysis; (core samples) Primary + Check for 6 radicals i.e. CaO, MgO, Al ₂ O ₃ , SiO ₂ , Fe ₂ O ₃ and LOI	Nos.	90
B.	Chemical Analysis; (Surface samples) Primary for 6 radicals i.e. CaO, MgO, Al ₂ O ₃ , SiO ₂ , Fe ₂ O ₃ and LOI	Nos.	60
C.	External Check sample for analysis of 6 radicals i.e. CaO, MgO, Al ₂ O ₃ , SiO ₂ , Fe ₂ O ₃ and LOI (per BH 4 Sample)	Nos	15
D	Composite Samples For 12 radicals (CaO, MgO, Al ₂ O ₃ , SiO ₂ , Fe ₂ O ₃ , SO ₃ , P ₂ O ₅ , LOI, MnO ₂ , K ₂ O, Na ₂ O and Cl.)	Nos	10
E	ICP-OES/ICP-MS (sequential technique) sample package for 34 elements i.e. 16 other elements viz. Li, Ga, In, Be, Ge, Mo, Cr, Ta, W, Ba, Co, Rb, Sr, Zr, Nb, Ni,; 18 REE viz. La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Sc, Y; 02 Actinides viz. U, Th (Per BH 3 Sample)	Nos.	10
4	Petrographic / mineragraphic study		
A	Digital Photographs	Nos.	10



5	Geotechnical Study		
A	Specific Gravity Determinations	Nos.	5
6.	Geological Report Preparation	Nos.	1

6. Exploratory Drilling (Refer another document on exploratory drilling)

Total area of the proposed block is 10.00 Sq. Km This area is proposed for exploration by drilling 3 nos. of Scout Bore holes drilling with cumulative meterage of 120m with vertical depth of 40m each in bedded deposits as per MEMC 2015 guidelines for G3 stage of exploration. The borehole locations are given in the Plate – IV.

9. Reference:

- 1) Geological Report by Pandya P.R (1997-98) of CGM Gujarat : on parts of Jamnagar district covered under Toposheet Nos 41 F/3, 41 F/4, B/15 & B/16 based on Interpretation of Satellite imagery with limited field check , at Devbhumi-Dwarka Gujarat
- 2) Report by Uniyal A.I of CGM Gujarat on detailed mineral survey for limestone of Okhamandal Taluka of Jamnagar District FS 2010-11
- 3) GSI report on quaternary geological mapping in the parts of Saurashtra area in the FS 1971-72 by K.K. Verma and U.B. Mathur.



PRB INFRAPROJECTS PRIVATE LIMITED

(Notified Private Exploration Agency)

WORK PLAN-G4 STAGE EXPLORATION FOR LIMESTONE

IN BHATIYA LIMESTONE BLOCK



7.0 TIME SCHEDULE

Item of Work	1	2	3	4	5	6	7	8	9	10	11	12
1 Pre field preparation & forest clearances												
2.Detailed Mapping (1:12500), Bed rock Sampling and Chemical analysis												
3. Drilling & Chemical analysis												
4. Review												
5.Interpretation of analytical data, finalization of litho logs, plates												
6. Review & report preparation / Peer review												
7. Final submission												

Note: Date of commencement of the work schedule will be taken up on necessary clearance and approval from concerned government agencies like forest.

Manpower Deployment Geologist party:

- 2 Geologist-210 Field days+ 60 HQ days

Sampler Party

1-Sampler – 60 Days and 4 Labors-(60x4)=240 Days

Drilling Party

1 Driller, 2 Assistant Driller, 1 Rig man, 6 labors for Apprx. 120 days



PRB INFRAPROJECTS PRIVATE LIMITED

(Notified Private Exploration Agency)

**WORK PLAN-G4 STAGE EXPLORATION FOR LIMESTONE
IN BHATIYA LIMESTONE BLOCK**

Bhatiya Limestone Block- G4 Level- 10.00 Sqkm						
Item	Item of Work	Item	SOR Sr No & Rates		Estimated Cost	
Sr No.	Item	Unit	Sr. No.	Rates	Qty.	Amount (Rs)
A	Survey work					
1	DGPS Survey BH fixation and RL determination (3 BHP & 5 BP)	Per Point	1.6.2	19,200	8	153600.00
	Sub Total- A					153600.00
B	GEOLOGICAL WORK (Mapping 1:12500 scale)					
	Geological mapping and other works & surveying					
i	Charges for one Geologist- Field	day	1.2	11,000	210	2310000.00
ii	Charges for one Geologist per- HQ	day	1.2	9,000	60	540000.00
iii	2 labours/ party	day	5.7	504	420	211680.00
iv	Sampling -1 Samplers	day	1.5.2	5,100	60	306000.00
v	Sampling 4 labours/ party	day	5.7	504	240	120960.00
	Sub Total- B					3488640.00
C	LABORATORY STUDIES					
1	Chemical Analysis					
i	A. Chemical Analysis; Primary core samples for 6 radicals i.e. CaO, MgO, Al ₂ O ₃ , SiO ₂ , Fe ₂ O ₃ and LOI	Nos	4.1.15a	4,200	90	378000.00
	Chemical Analysis; Primary Surface samples for 6 radicals i.e. CaO, MgO, Al ₂ O ₃ , SiO ₂ , Fe ₂ O ₃ and LOI	Nos	4.1.15a	4,200	60	252000.00
	External Check sample for analysis of 6 radicals i.e. CaO, MgO, Al ₂ O ₃ , SiO ₂ , Fe ₂ O ₃ and LOI .	Nos	4.1.15a	4,200	15	63000.00
ii	Composite Samples For 12 radicals (CaO, MgO, Al ₂ O ₃ , SiO ₂ , Fe ₂ O ₃ , SO ₃ , P ₂ O ₅ , LOI, MnO ₂ , K ₂ O, Na ₂ O and Cl.)	Nos	4.1.1	8,157	10	81570.00
2	Physical, Petrological, Mineralogical Studies					0.00
i	XRD studies for identification of minerals (Random)	Nos	4.5.1	4000	10	40000.00



ii	ICP-OES/ICP-MS (sequential technique) sample package for 34 elements i.e.16 other elements viz. Li,Ga,In,Be,Ge,Mo,Cr,Ta,W,Ba,Co,Rb,Sr,Zr, Nb,Ni,: 18 REE viz. La,Ce,Pr,Nd,Sm,Eu, Gd,Tb,Dy,Ho,Er,Tm, Yb,Lu,Sc,Y:02 Actinides viz.U,Th.	Nos	4.1.14	7731	10	77310.00
vi	Digital Photographs	Nos	4.3.7	280	10	2800.00
3	Geotechnical Laboratory					0.00
i	Specific Gravity Determinations	Nos	4.8.1	1605	5	8025.00
	Sub Total- C					902705.00
D	DRILLING					
i	Core Drilling (scout BH 03 Nos) x Each 40 Mtr depth = Total 120 Mtrs	m	2.2.1.1b	7,168	120	860160.00
ii	Land / Crop Compansation (As Per Requirment)	per BH	5.6	20,000	3	60000.00
iii	Construction of concrete Pillar (3BHP +5 BP)	per BH	2.2.7a	2,000	8	16000.00
iv	Transportation of Drill Rig & associated (1Rig 2812 km.Up & Dn)	Km	2.2.8	36	2,812	101232.00
v	Monthly Accomodation Charges for drilling Camp	month	2.2.9	50,000	3	150000.00
vi	Drilling Camp Setting Cost	Nos	2.2.9a	250,000	1	250000.00
vii	Drilling Camp Winding up Cost	Nos	2.2.9b	250,000	1	250000.00
viii	Approach Road Making (Flat Terrain)	Km	2.2.10a	22,020	5	110100.00
ix	Core Preservation.	m	5.3	1,590	120	190800.00
	Sub Total- D					1988292.00
	Total A to D					6533237.00
G	Geological Report Preparation (A minimum of Rs. 2.5 lakhs or 5% of the total value of work whichever is more)	1No.	5.2			326661.85
H	Peer review Charges	1No.		30000		0.00
I	Preparation of Exploration Proposal (2% of the Cost or Rs. 5 Lakhs whichever is lower)	1No.	5.1			130664.74
J	Total Estimated Cost without GST					6990563.59
K	Provision for GST (18% of I)					1258301.45
L	Total Estimated Cost with GST					8248865.04

(RS. EIGHTY TWO LACS FORTY EIGHT THOUSAND EIGHT HUNDRED SIXTY FIVE & PS FOUR ONLY)



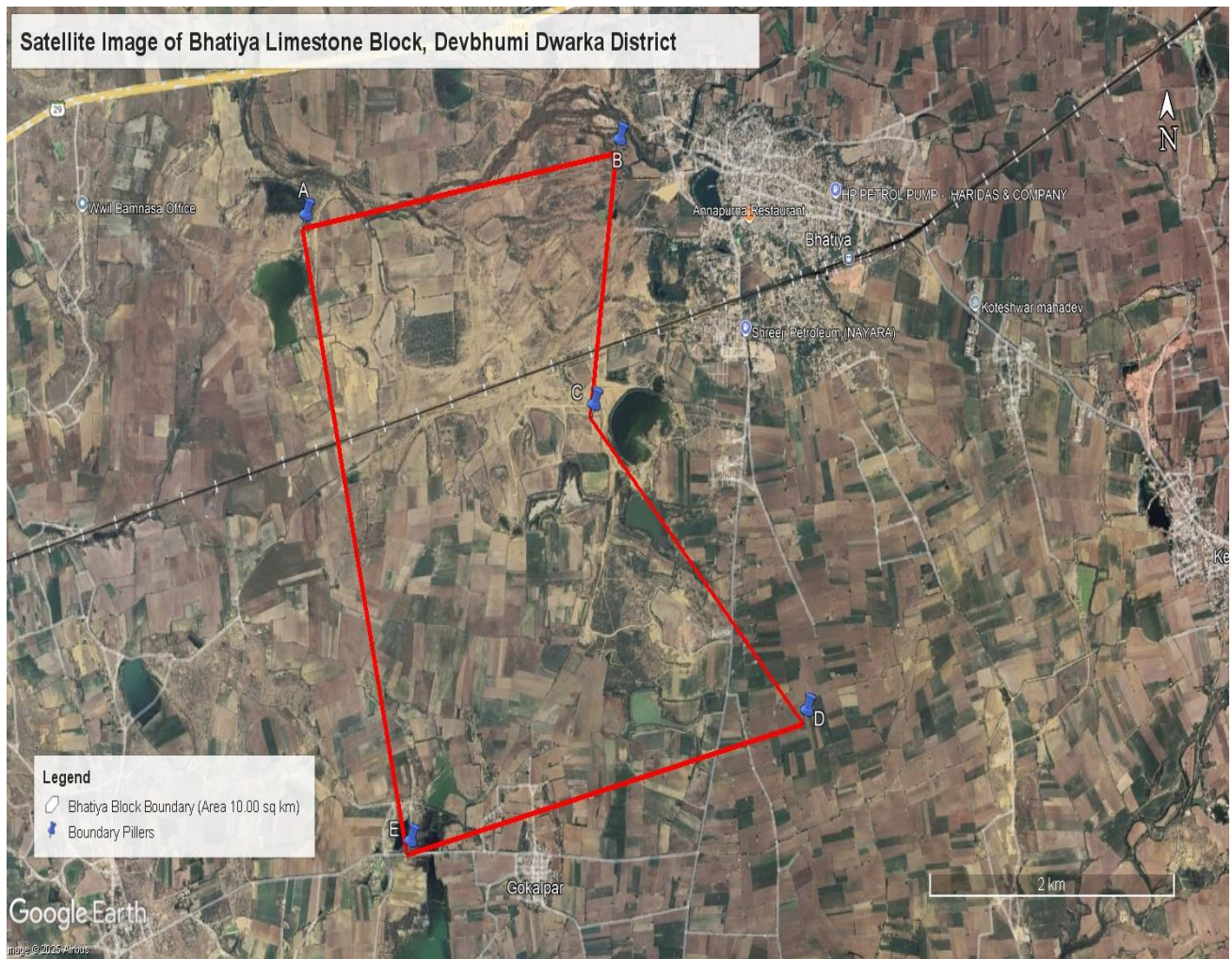


PLATE - II

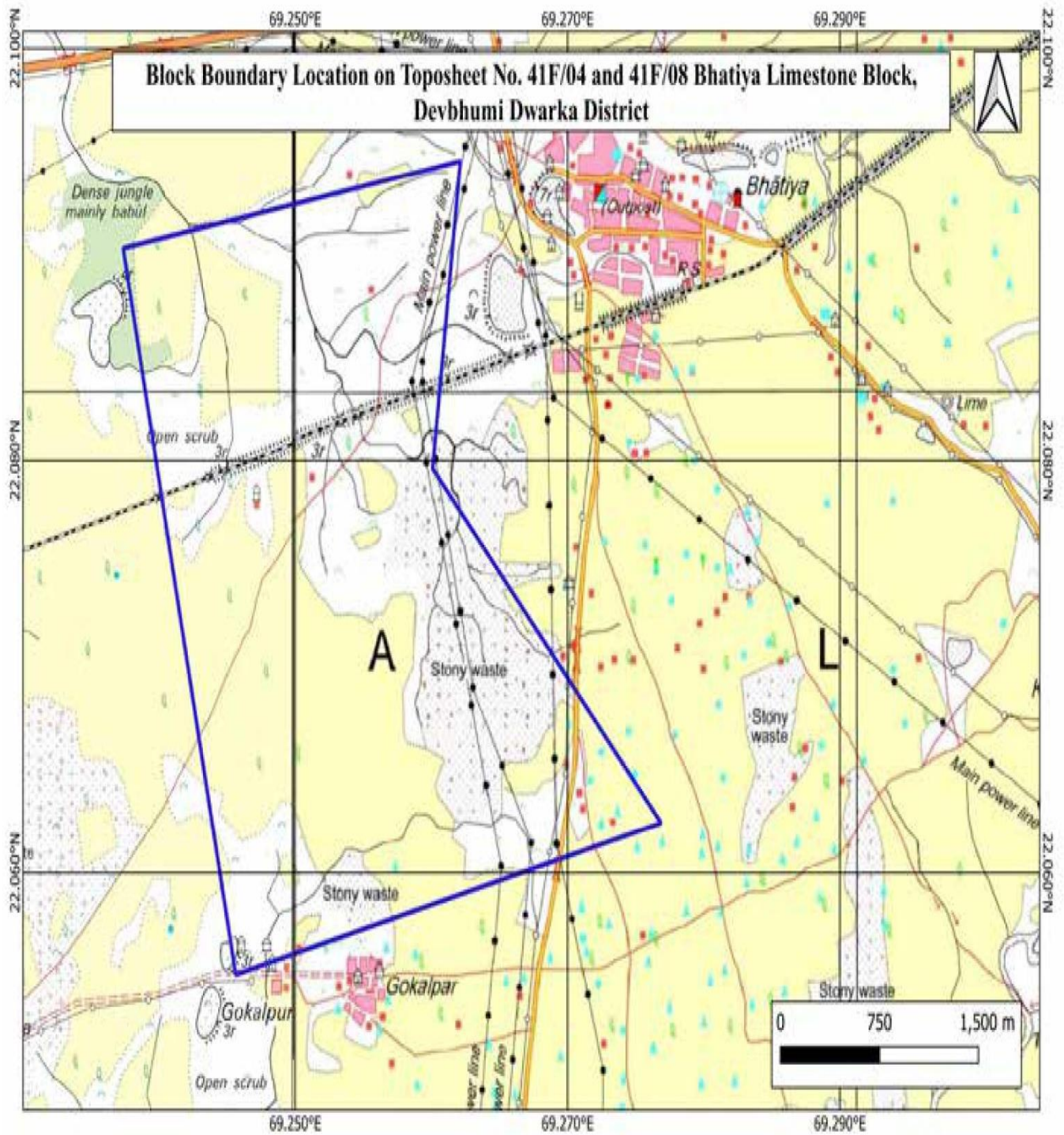


PLATE - III

