

**Reconnaissance Survey (G-4) for Bauxite and associated
Critical minerals in Kapadvanj block, Kheda District, Gujarat.**

To



**National Mineral Exploration and Development Trust Secretariat
Ministry of Mines
9th Floor, Jeevan Prakash LIC Building,
Kasturba Gandhi Marg,
New Delhi – 110001**

By



**Geo Marine Solutions Pvt. Ltd.
15-17-909/9, Leslie Haven, 5th Cross,
Shivabagh, Mangalore-575005, Karnataka**

April 2026

**Reconnaissance Survey (G-4) for Bauxite and associated
Critical minerals in Kapadvanj block, Kheda District, Gujarat**

To



**National Mineral Exploration and Development Trust Secretariat
Ministry of Mines
9th Floor, Jeevan Prakash LIC Building,
Kasturba Gandhi Marg,
New Delhi – 110001**

By



**Geo Marine Solutions Pvt. Ltd.
15-17-909/9, Leslie Haven, 5th Cross,
Shivabagh, Mangalore-575005, Karnataka**

**Mangalore
April 2026**

Summary of the Proposal for “Reconnaissance Survey (G-4) for Bauxite and associated Critical minerals in Kapadvanj block, Kheda District, Gujarat.”

	Features	Details
	Block ID	GUJ-BAUX-3
	Current Exploration Agency	Geo Marine Solutions Pvt. Ltd., Mangalore
	Previous Exploration Agency	Commissioner of Geology and Mining
	Previous Geological Report	1.Report on the detailed geological survey for bauxite around Ladvel, Dujavar etc. Villages of Kapadvanj taluka of Kheda district in parts of (Toposheet no.46E/4 & 46F/1) (Commissioner of Geology & Mining, FSP-1998-99)
	Commodity	Bauxite and associated Critical minerals
	Mineral Belt	The Bauxite of Dakor - Kapadvanj belt
	Completion Period with entire Time schedule to complete the project	<p>Mobilization: 1 month</p> <p>Field work: Mapping (Geological), Pitting, Drilling, BH Fixation and RL determination using DGPS :3 months</p> <p>Laboratory Analysis: 3 months</p> <p>Report writing: 2 months</p> <p>Peer review, modification of report after peer review, Submission of hard copies & uploading to NGDR: 1 months</p> <p>Total: 10 months</p>
	Objectives	Although the occurrence of Laterite/Bauxite within the 47.5 sq. km area is sparse, as per previous sample analyses, including those collected by Geo Marine Solutions, indicate potential mineralization. The objective of this

		study is to conduct geological mapping of the entire area on 1:12,500 scale to evaluate Bauxite and associated critical minerals such as Vanadium, Gallium, and Scandium. Based on the results, scout drilling will be carried out in mineralized zones to determine the thickness and extent of the ore-bearing horizons which will help in further exploration.
	Whether the work will be carried out by the proposed agency or through outsourcing and details thereof.	The NABET accredited exploration agency (Geo Marine Solutions Pvt Ltd., Mangalore) will be carrying out all the components of the proposed exploration. The chemical analysis will be done at NABL accredited lab.
	Name/Number of Geoscientists	2 Geologists
	Expected Field Months (Geology)	Field work: 3 months

1.	Location	Kapadvanj, Kheda district, Gujarat.		
		Boundary points	Longitude (DD)	Latitude (DD)
		A	73.084	22.992
		B	73.133	22.991
		C	73.133	22.906
		D	73.084	22.907
	Villages	Ladvel, Sikandar Porda, Savali, Salod, Rampura, Vejalpur		
	Tehsil/Taluk	Kapadvanj		
	District	Kheda		
	State	Gujarat		
2.	Area (hectares/square kilometers)			
	Block Area	47.5 Sq.km		
	Forest Area	Nil		
	Government Land Area	-		

	Private Land Area	Data Not Available
3.	Accessibility	
	Nearest Rail Head	Kapadvanj (KVNJ) Railway Station (1.3 Km)
	Road	NH 848K & NH 8
	Airport	Sardar Vallabhbhai Patel International Airport (AMD) in Ahmedabad (65km)
4.	Hydrology	
	Local Surface Drainage Pattern (Channels)	The drainage pattern in the area is dendritic (CGWB-2022)
	Rivers/Streams	Mohar River
5.	Climate	
	Mean/Average Annual Rainfall	749 mm per annum
	Temperatures (December)(Minimum) Temperatures (June)(Maximum)	In Kheda, Gujarat, temperatures vary from mild winters to scorching summers. The winter season (November to February) is the coolest, with temperatures typically ranging from 12°C to 29°C (53°F to 85°F). Summers (March to June) are intensely hot, peaking in May with average highs of 41°C (106°F) and lows around 28°C (82°F). During the monsoon (July to September), the heat moderates slightly to between 26°C and 34°C (78°F to 93°F), though high humidity persists until drier conditions return in October.
6.	Topography	
	Toposheet Number	Toposheet No. 46F/01

	Morphology of the area	Generally, the area is more or less plain except some low ridges and isolated mound of sands. One hill to the south of Sorna village and another Mota Ratnakar Mata hill to the South - West of village Nava Muwada are two topographically prominent hillocks. The maximum height attained by this hilly area is 94.02 mtrs above MSL. The direction of drainage of the area is southern to south western. Mohar river is flowing west of our study area and Narmada main canal is going through the study area.
7	Availability of baseline geoscience data	
	Geological Map (1:50K/25K)	1:50K Geological Map of GSI is available for Toposheet No. 46F/01 & referred for preparation of this proposal
	Geochemical Map	NGCM Data is not available
	Geophysical Map (Aero-geophysical, Ground geophysical, Regional as well as local scale GP maps)	Geophysical inputs (Ground geophysical: - gravity & magnetic) pertaining to the area falling in 46F/01 is available.
8	Justification for taking up G4 stage mineral exploration	<ul style="list-style-type: none"> • Report on the detailed geological survey for bauxite around Ladvel, Dujavar etc. Villages of Kapadwanj taluka of Kheda district in parts of toposheet no.46E/4 & 46F/1 by Commissioner of Geology & Mining, Gujarat (FSP:1998-99), conducted a detailed geological mapping on 1:8000 scale and 8 pockets of Bauxite were demarcated. The Bauxite deposits are associated with Laterite. • Chemical Analysis of 10 pit samples of this area showing average containing Al₂O₃ - 52.03%, Fe₂O₃ - 6.52%, SiO₂ - 3.48 %, TiO₂ - 8.31% and LOI - 28.57% can be classified in metallurgical grade.

		<ul style="list-style-type: none"> • Economic mineral bauxite is occurring in the area and a total of 1.489 million tones reserves of bauxite was estimated in the area investigated. • 9 samples were collected by Geo Marine Solutions Pvt Ltd i.e K1,K1/A,K2,K3,K4,K5,K6,K6/A&K7 where K4 is Bauxite (Al_2O_3-42.85%& Fe_2O_3 is 15.31% &SiO_2 - 7.11%) and K6/A falls in Aluminous laterite field with 40.45% Fe_2O_3 & 7.28% SiO_2.whereas K1,K2,K6 & K7 are Laterite (Al_2O_3 between 12.08% to 16.30% with an average of 15.13%, Fe_2O_3 between 13.43% & 31.59% with an average of 22.70% & SiO_2 from 5.17 to 11.68% with an average of 8.65% • Sample K1/A, K3 & K5 shows high CaO % 42.5%, 37.7% & 36.2% respectively, hence these are considered as Limestone. • Apart from Bauxite, Laterite & Limestone some Trace elements show encouraging values in K1, K2, K4, K6 & K6/A. It includes Sc (24.23-50.25ppm) with an average of 49.51pm, Ga (30.17ppm to 84.27 ppm) with an average of 49.51 ppm & V_2O_5 varies from 0.06% to 0.18 % with an average of 0.11%.
--	--	---

DETAILED DESCRIPTION OF THE PROPOSAL

1. Block Summary:

a) Physiography

The geomorphology of the proposed block area is more or less plain except some low ridges and isolated mound of sands. One hill to the south of Sorna village and another Mota Ratnakar Mata hill to the South - West of village Nava Muwada are two topographically prominent hillocks. The maximum height attained by this hilly area is 94.02 m above MSL. The direction of drainage of the area is southern to south western. Some isolated ponds are also located around villages Nana Rampura, Savali, Sikander na Porda, Darsing na Muwada, Kathana etc. of the investigated area.

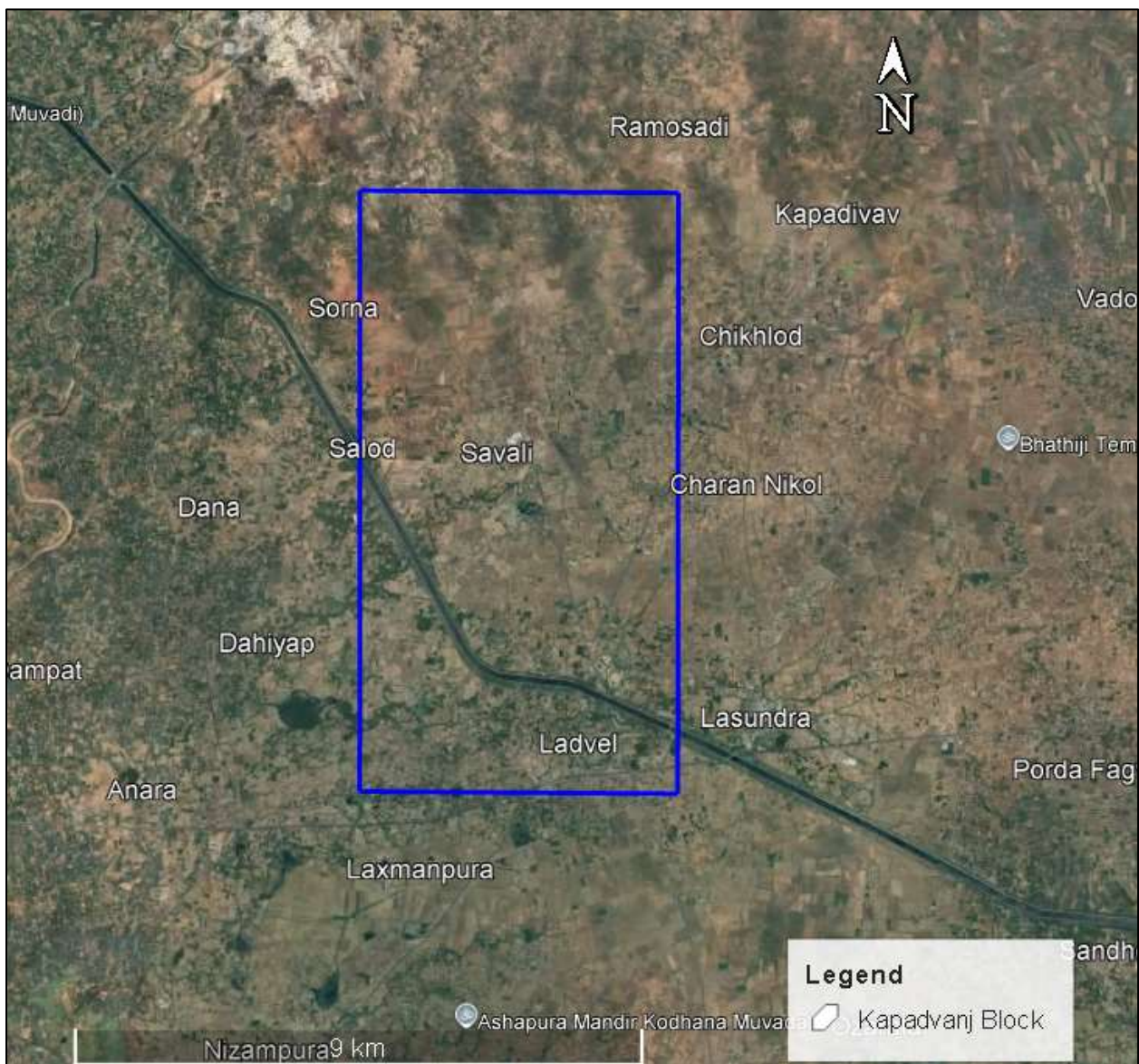


Fig1: Proposed Kapadvanj block boundary on Google Earth Imagery

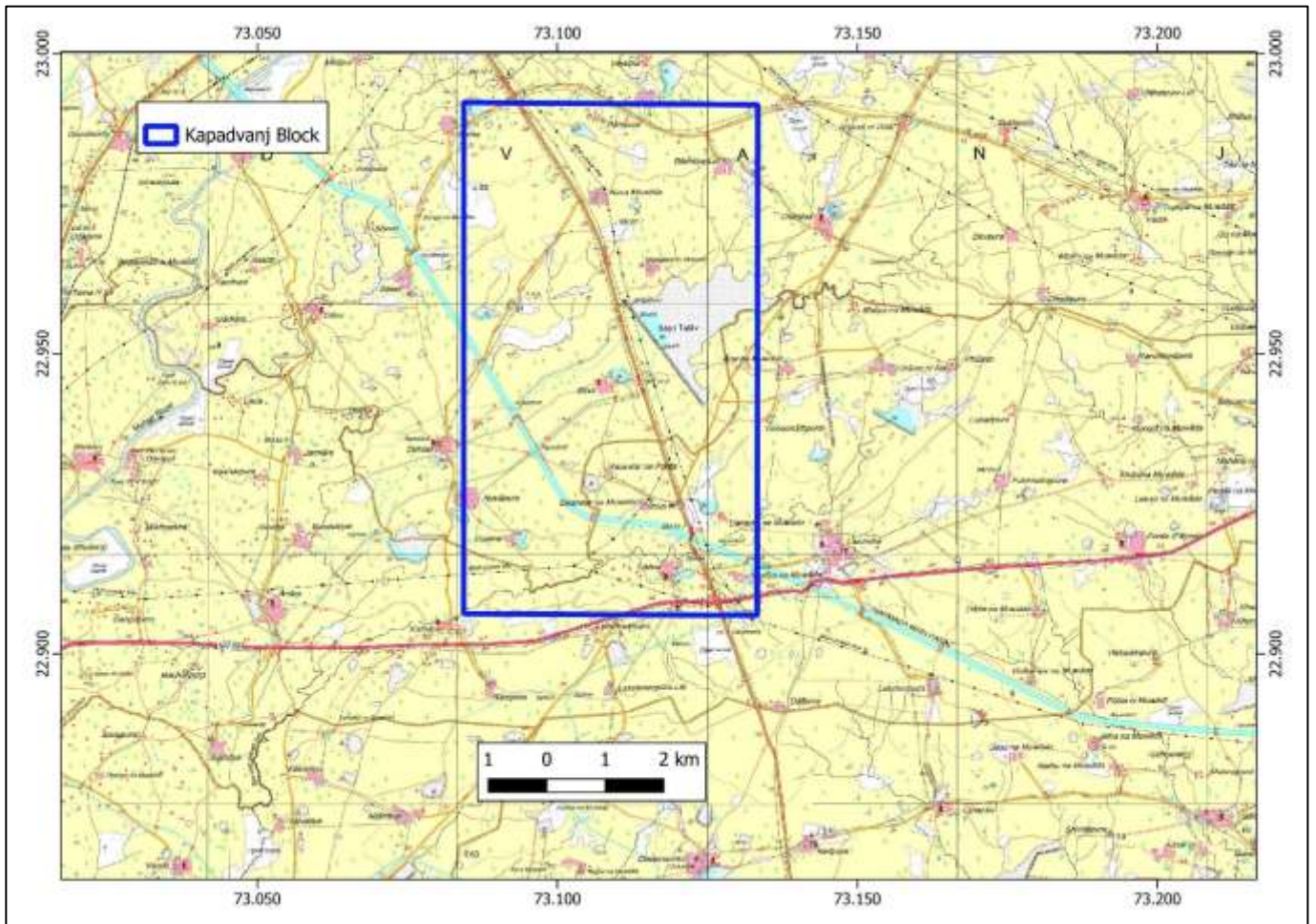


Fig 2. Khera Kapadvanj block on SOI Toposheet No. 46F/01

b) Background Geology

The study area is largely underlain by basalt, which acts as the principal source rock for laterite and bauxite formation. Prolonged sub-aerial weathering under tropical climatic conditions has resulted in the development of laterite caps and lateritic bauxite pockets over basaltic highs. The terrain is characterized by flat to gently undulating plateaus, shallow drainage channels, and localized hillocks capped by laterite and bauxite.

The general geological sequence as described Sahastrabudhe and Kulkarni of GSI (1961-62) is as under.

Alluvium -----	Recent to Sub Recent
Laterite -----	Pleistocene
Argillaceous & Calcareous sandstones, Limestones, clays, etc -----	Early Eocene
Deccan Trap-----	Cretaceous

On the basis of geological observation made during the course of field work, geological succession in the area is as under.

Table 1: Geology of the area

Formation	Age	Rock Types
Recent	Holocene	Soil, Brown sand, Alluvium and kankar
Supratrappean	Paleocene	Laterite, Bauxite, Lithomargic clay

c) Mineral potentiality based on geology, geophysics, ground geochemistry etc.

Based on the data generated by the Commissioner of Geology & Mining, Gujarat & Geo Marine Solutions Pvt Ltd., Mangalore, the Kapadvaj Block is worth exploring for G4 for Aluminous Laterite, Bauxite, Limestone, & associated Critical minerals (Gallium, Scandium, Vanadium etc).

d) Scope for proposed exploration

- The study area is largely underlain by basalt, which acts as the principal source rock for laterite and bauxite formation.
- The Bauxite deposit of this area is found mixed-up with laterite. The Laterite and bauxite formation rest over the concretionary limestone.
- During the investigation, CGM Gujarat mapped an area of 62 Sq km on 1:8000 scale and 8 pockets of bauxite were demarcated covering an area of 199040 sq. mt. (0.199 sq. k.m.)
- Bauxite occurs in the area and a total of 1.489 million tones reserves of bauxite is estimated in the area, with thickness of 0.30 to 4.10 m.
- The Chemical Analysis of 10 pit samples of this area showing average Al_2O_3 - 52.03%, Fe_2O_3 - 6.52%, SiO_2 - 3.48%, TiO_2 - 8.31% and LOI - 28.57% can be classified in metallurgical grade.
- The occurrence of bauxite pockets in northern part of present investigated area has been noticed and hence it is recommended to continue one detailed survey scheme in the next field season.
- A total of nine samples (K1, K1/A, K2, K3, K4, K5, K6, K6/A, and K7) were collected by GeoMarine Solutions Pvt. Ltd. Based on chemical analysis, K4 is classified as bauxite due to its high Al_2O_3 content (42.85%). Sample K6/A is identified as aluminous laterite based on its significant Al_2O_3 content. Samples K1, K2, K6, and K7 are categorized as laterites, showing average values of 15.13% Al_2O_3 , 22.70% Fe_2O_3 , and 8.65% SiO_2 , which are typical of lateritic composition.
- Samples K1/A, K3, and K5 contain high CaO (36.2–42.5%) and are therefore classified as limestone.

- In addition, samples K1, K2, K4, K6 & K6/A show encouraging trace element concentrations, including Sc (24.23–50.25 ppm), Ga (30.17–84.27 ppm), and V₂O₅ (0.06–0.18 ppm).
- All these suggests the Kapadvanj block may be explored for G4 for Aluminous Laterite, Bauxite, Limestone along with Critical minerals (Gallium, Scandium, Vanadium etc).

e) Recommendations of G4 Stage Mineral Exploration Report

- **Commissioner of Geology and Mining (1998-99):** The occurrence of bauxite pockets in northern part of present investigated area has been noticed and hence it is recommended to continue one detailed survey scheme in the next field season.
- This block has been awarded to Geo Marine Solutions by NMEDT for further Upgradation (if possible).

f) Objectives

- Geological mapping (1: 12,500 Scale)
- Pitting – 24 Cu.m (12 no. of pits -1mX1mX2m)
- Core drilling - 250m
- Microscopic and petrological studies – 10 Nos.
- XRD Analysis – 5no.s
- Geological report preparation- 1 Nos.

2. Previous work

a) Previous Geological Report

- **(Commissioner of Geology & Mining, FSP-1998-99):** Report on the detailed geological survey for bauxite around Ladvel, Dujavar etc. Villages of Kapadvanj taluka of Kheda district in parts of (toposheet no.46E/4 & 46F/1)

b) Previous exploration in adjoining area (Regional area)

- **(Commissioner of Geology & Mining, FSP-1998-99):** Report on the detailed geological survey for bauxite around Ladvel, Dujavar etc. Villages of Kapadvanj taluka of Kheda district in parts of (toposheet no.46E/4 & 46F/1)

c) Previous Exploration details in the proposed block area

- **(Commissioner of Geology & Mining, FSP-1998-99)** conducted a detailed geological mapping on 1:8000 scale and 8 pockets of Bauxite were demarcated covering an area of 199040 sq. mt. (0.199 sq. k.m.)
- The Bauxite deposits are associated with Laterite. The Laterite and bauxite formation rest over the concretionary limestone.
- Petrographic study of 10 pit samples showing average containing Al₂O₃ - 52.03%, Fe₂O₃ - 6.52%, SiO₂ - 3.48 %, TiO₂ - 8.31% and LOI - 28.57% can be classified in metallurgical grade.
- Bauxite occurring in the area and a total of 1.489 million tones reserves of bauxite is estimated in the area, with thickness of 0.30 to 4.10 m.
- The occurrence of bauxite pockets in northern part of present investigated area has been noticed and hence it is recommended to continue one detailed survey scheme in the next field season

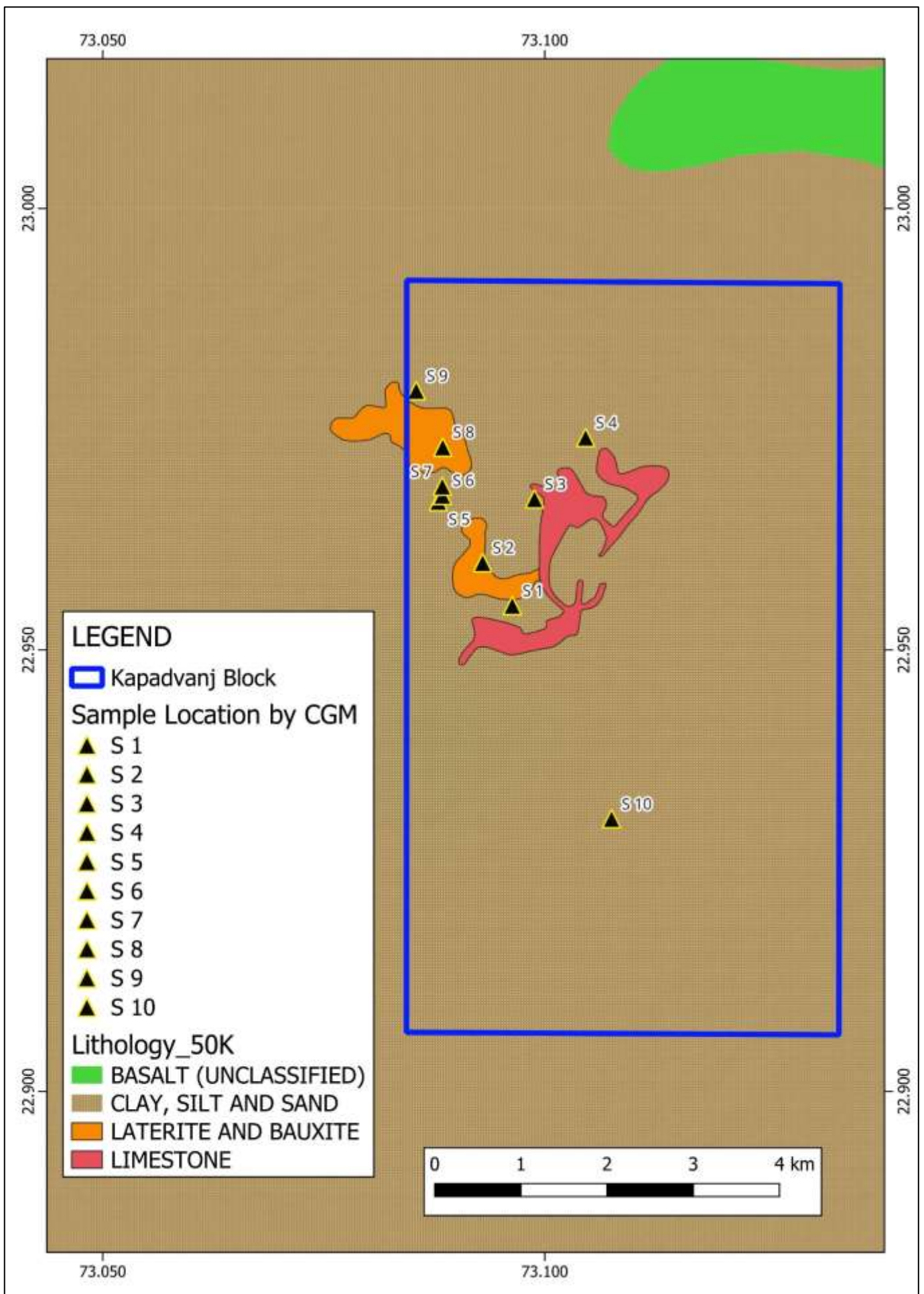


Fig 3: Previous exploration sample locations in Kapadvanj block, demarcated on Geological Map on 1:50K scale (Source: GSI-NGDR)

Table 2: Analytical results of the samples collected from proposed block by Geo Marine Solutions

Sample No.	Longitude	Latitude	Al₂O₃	CaO	V₂O₅	Sc	Ga
	DD	DD	%	%	%	%	%
K1	73.106888	22.930678	16.30	19.389	0.059	32.03	39.12
K1/A	73.106888	22.930678	5.97	42.538	0.020		
K2	73.105740	22.970580	12.08	19.094	0.182	50.25	30.17
K3	73.098656	22.967180	8.94	37.753	0.050		
K4	73.092841	22.959027	42.85	0.533	0.084	44.37	84.27
K5	73.094395	22.957091	11.13	36.298	0.051		
K6	73.085895	22.978930	15.97	23.926	0.075	29.35	37.28
K6/A	73.085895	22.978930	28.06	0.184	0.112	24.23	56.71
K7	73.087873	22.967142	16.19	26.814	0.112		

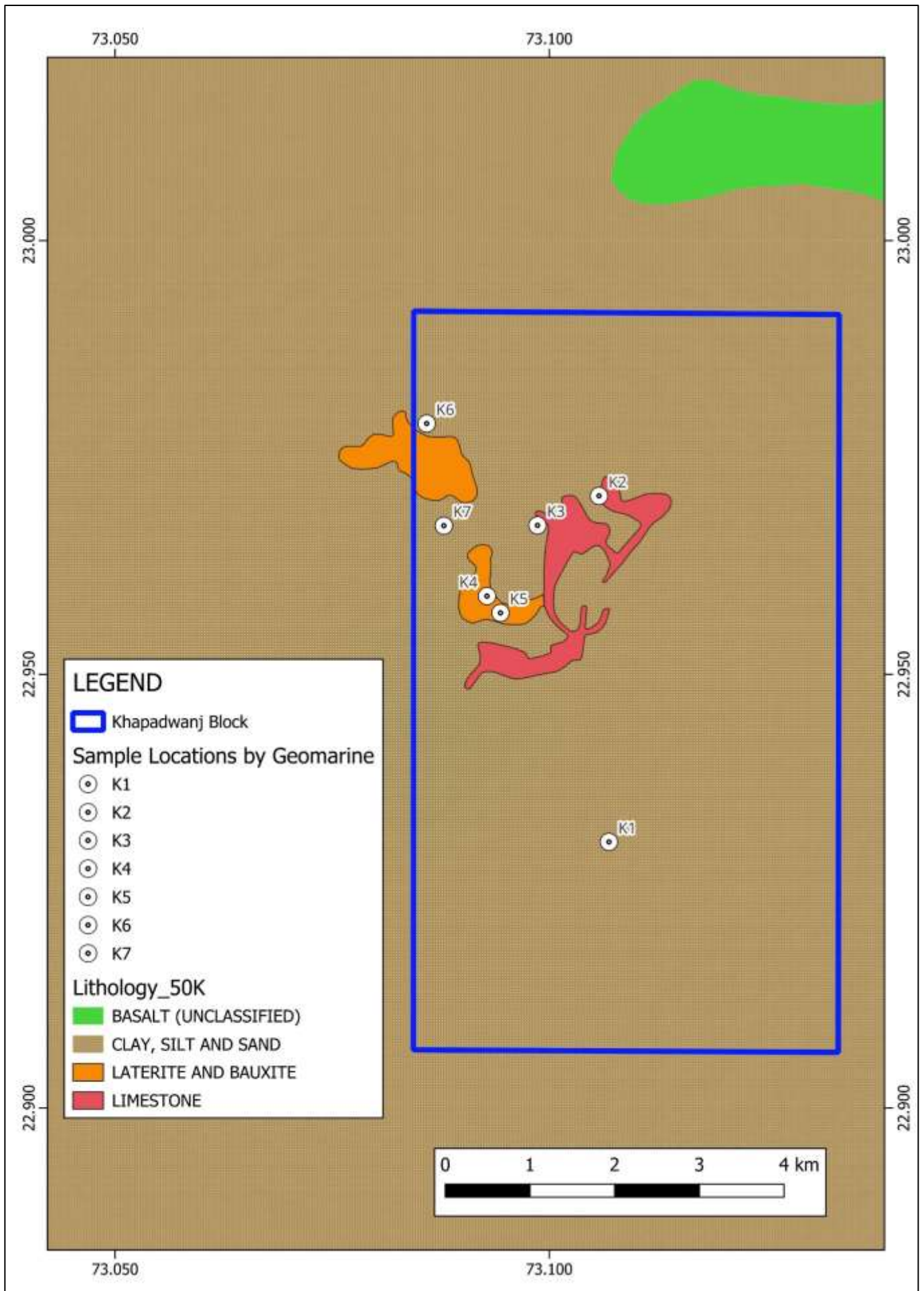


Fig 4: Sample locations by Geo Marine Solutions in Kapadvanj block on 1:50000 scale (Source: GSI-NGDR)

3. Block description

BLOCK CORNER POINTS	LONGITUDE (DD)	LATITUDE (DD)
A	73.084	22.992
B	73.133	22.991
C	73.133	22.906
D	73.084	22.907

4. Planned methodology

- **Geological mapping:** - The total area of 47.5 sq km will be mapped on 1:12,500 scale to bring out different geological and geomorphological units. All the mapped units will be linked (geo- referenced) to the toposheet (46F/01) pertaining to the area.
- **Core drilling for Sub surface mineral content:** Drilling of 5 Scout boreholes up to 30m bgl or up to bedrock whichever is occurring earlier & collection of sub-samples at 1.0 m interval.

5. Nature Quantum and Target

Sl. No.	Description of Work	Unit	Time required
1	Geological Mapping (1:12500 Scale) (GM/DM)	47.5 sq km	120 days (3 month)
2	Pitting	24 cu. m	
3	Scout Drilling	250m	
Laboratory studies			
4	XRF (76 from Drill core & 24 pit sample)	100 Nos	90 days (3 month)

Sl. No.	Description of Work	Unit	Time required
5	XRF Check Samples (10%)	10Nos	
6	ICPMS (20 samples)	20 Nos	
7	ICPMS (Check Samples 10%)	2 Nos	
8	Mineragraphic studies -XRD (Surface & Borehole Core samples)	5 Nos	
9	Thin section	5 Nos	
10	Petrographic study	5 Nos	
11	Report preparation (soft copy)	1 No	60 days (2month)
12	Preparation of exploration proposals	1 No	

6. Break-up of expenditure and Time schedule: Attached as Excel

References:

- Report on the detailed geological survey for bauxite around Ladvel, Dujavar etc. Villages of Kapadwanj taluka of Kheda district in parts of (toposheet no.46E/4 & 46F/1 (Commissioner of Geology & Mining, FSP-1998-99).
- Aquifer mapping and management of ground water resources of Kheda district, Gujarat state CGWB (2022)
- GSI-NGDR

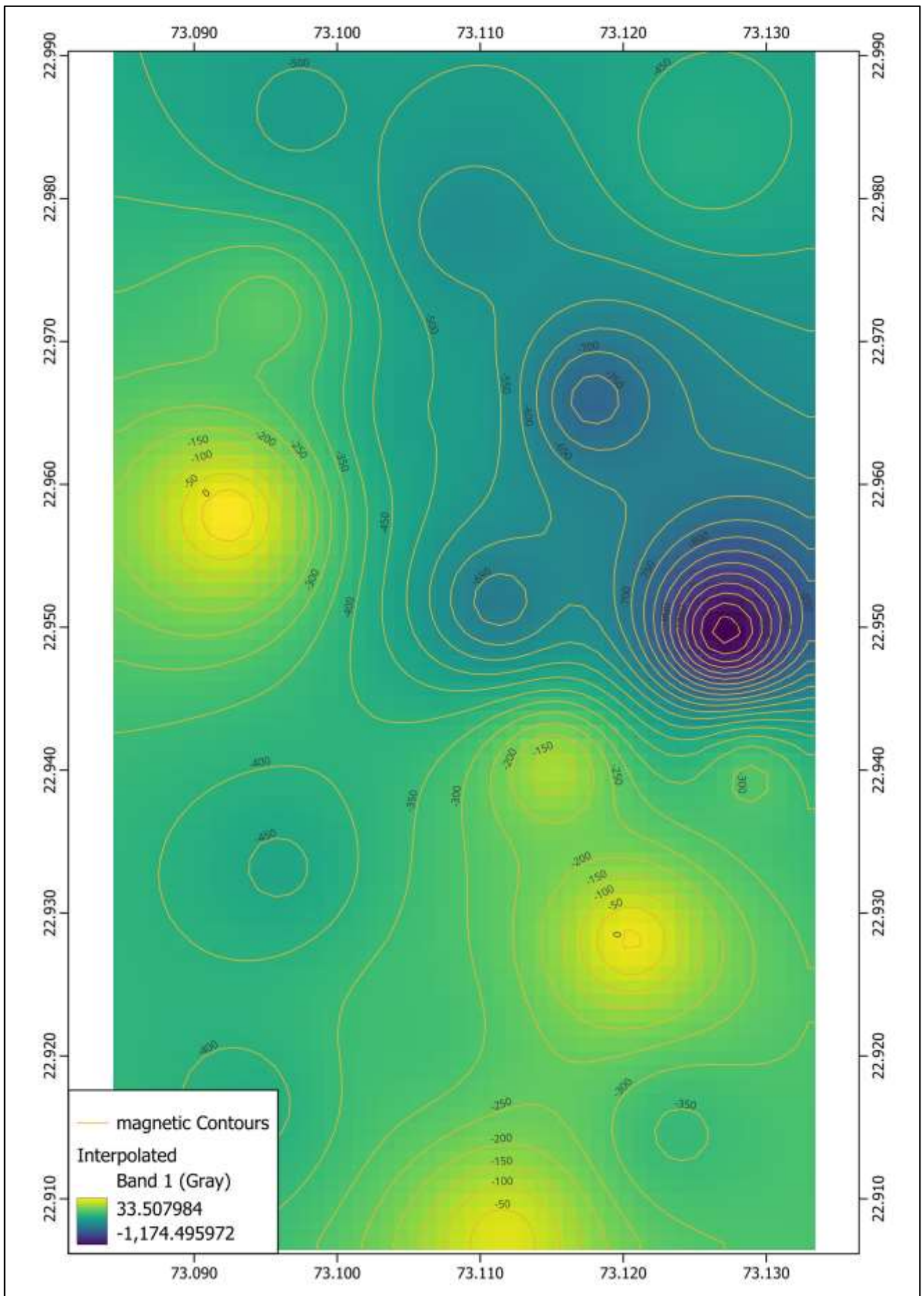


Fig 5: Magnetic Geophysical Map of proposed Kapadvanj block (Source: GSI-NGDR)

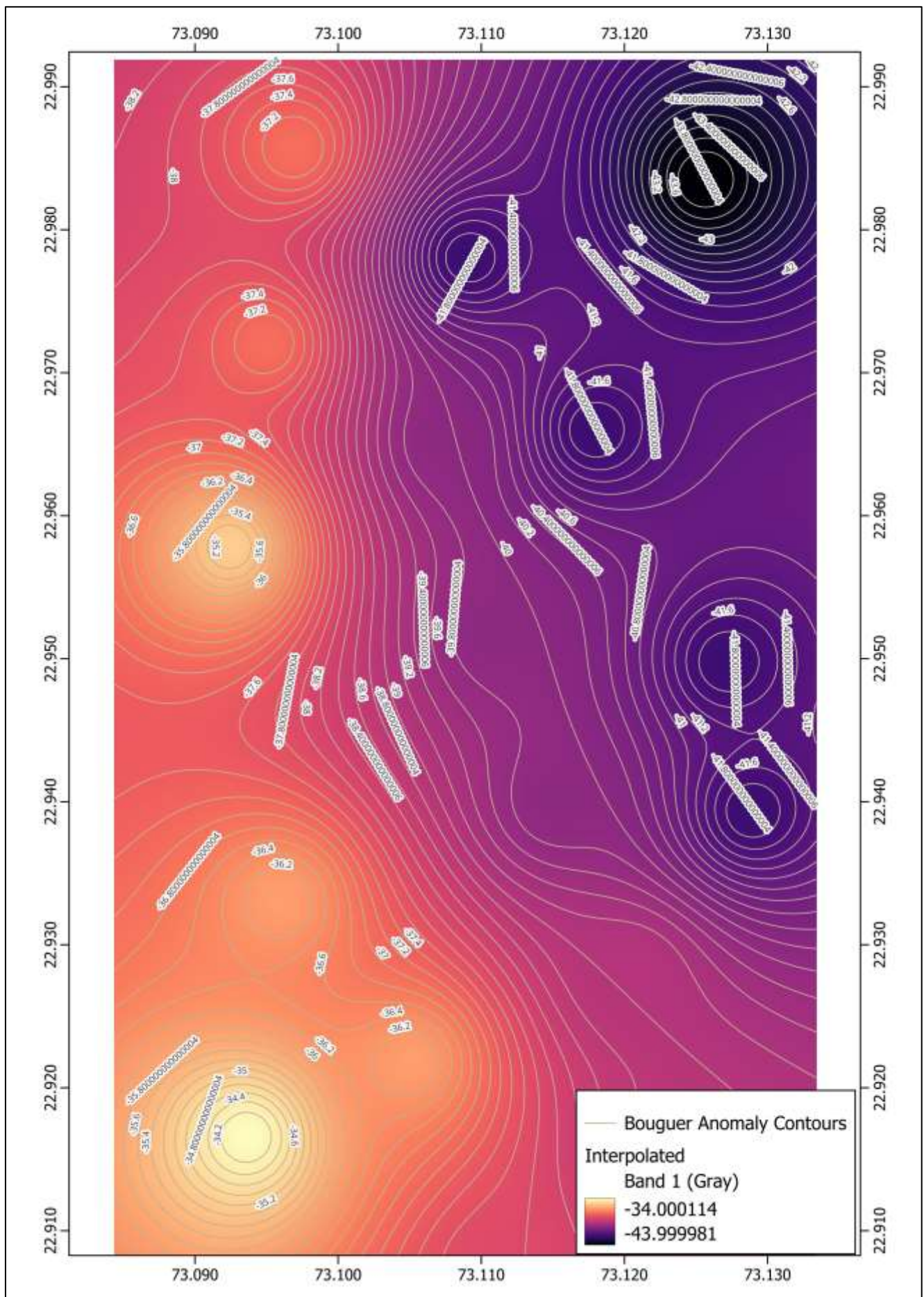


Fig 6: Gravity Geophysical Map of proposed Kapadvanj block (Source: GSI-NGDR)

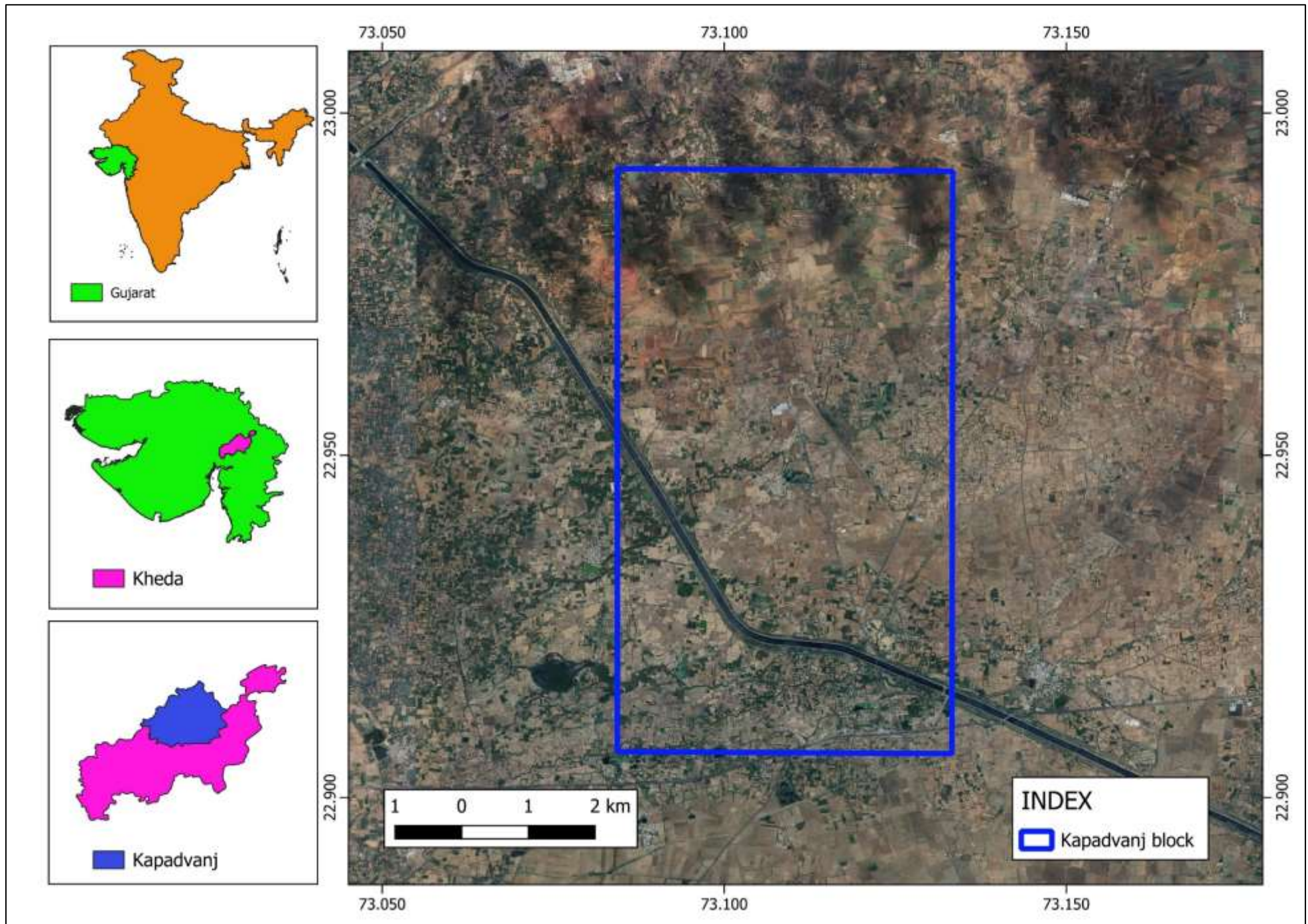


Fig 7: Location map of the proposed Kapadvanj block

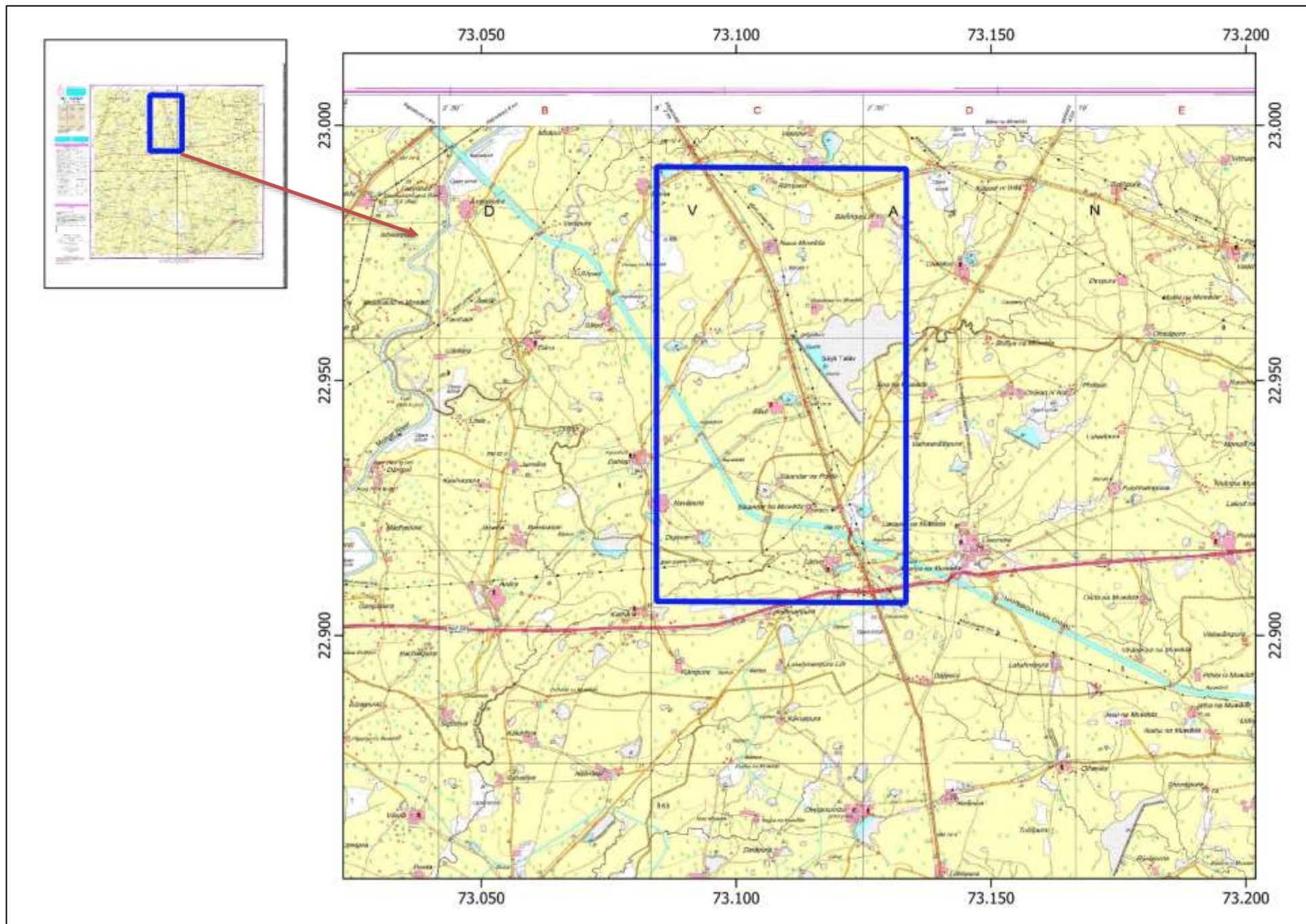


Fig 8: Kapadvanj block demarcated on Toposheet 46F/01

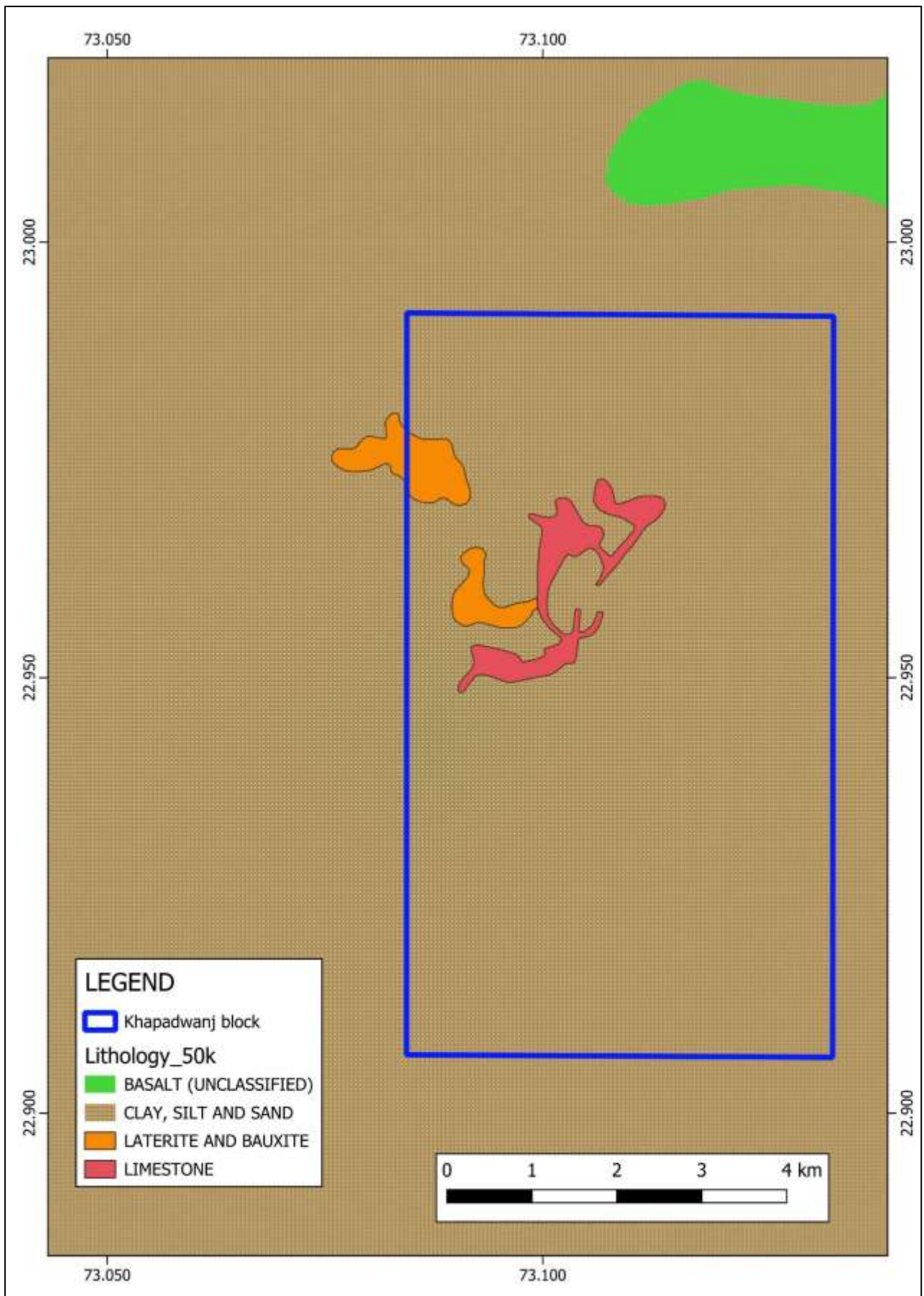


Fig 9: Kapadwanj block demarcated on 1:50K scale map (Source: GSI-NGDR-46F/01)

CHECKLIST FOR EXPLORATION AGENCIES FOR SUBMISSION OF EXPLORATION PROJECT PROPOSALS

Name of Project/Block: Reconnaissance Survey (G-4) for Bauxite, Laterite, Limestone, Vanadium, Gallium, Scandium and associated Critical minerals in Kapadvanj block, Kheda District, Gujarat.

Agency: GEO MARINE SOLUTIONS PRIVATE LIMITED

Nodal Personnel (Agency): P. Praveen Kumar

Date: 27.03.2026

Sl. No.	Items to be Verified by Agency	Yes/No	Page Number in submitted Document
1	Geospatial scrutiny completed using KML/coordinate dataset and AOI assessed (including exploration activities, mining areas, eco zones, dependencies).	Yes	Page No. 4 (Boundary coordinates)
2	Total Forest area in proposed block - with pic from PM Gatishakti portal. Type of forest (RF/PF/Sanctuary/National Reserve Forest) to be mentioned.	No	There is no forest area within the proposed block as per the Toposheet & Google Earth
3	Overlap study of previous exploration work carried out in any exploration agencies/departments, or ongoing/proposed exploration work by any agencies/departments done	Yes	No overlap
4	Baseline data availability (NGCM, NGPM, Geological Maps, Airborne geophysical data etc) on NGDR confirmed and reflected in comments.	Yes	<ul style="list-style-type: none"> • Geological Map is attached – page no. 20. • NGPM data is available – Page no. 16 • Aero Geophysical data is not available
5	Processing of Baseline Geoscience data (NGCM, NGPM, Geological Maps, Airborne geophysical data etc), legacy exploration data of proposed area, integration, analysis and interpretation presented in the project proposal/DPR	Yes	<ul style="list-style-type: none"> • Geological Map attached- Page No. 20 • NGPM map is attached in Page No. 17-18

6	Existing leases (ML/CL/EL etc.) in and around project area verified through NGDR/State DGM/Ministry of Mines	Yes	As per NGDR records, there are no EL areas within the proposed block. However, ML areas are present within the block. Details regarding CL areas are not available.
7	Whether the area falling within the buffer zone of International Boundary, Wildlife sanctuary, no-go zone, Biodiversity Park etc.	No	There is no buffer zone of International Boundary, Wildlife sanctuary, no-go zone, Biodiversity Park areas within the proposed block
8	Literature review and previous findings submitted by agency verified and reflected in DPR/In-principle (Page number of the particular to be mentioned in Reference / Bibliography)	Yes	Page No. (11-13)
9	Whether the agency has carried out field work in the proposed area, collected samples and presented their findings with analytical data in project proposal/DPR	Yes	Page No -14
10	Justification for proposed commodities and details of previous work included in DPR/In-principle. Reference to NMEDT's ongoing/completed projects verified and included in comments.	Yes	Page No. (6-7)

Other Information

Accreditation of Agency:

Date: 13.08.2025

Valid Upto: 17.08.2028

Notification of Agency:

Date: 19.03.2025

Valid Upto: 18.03.2028

Personnel Deployed

As per QCI NABET – 02 Geologist

Current strength -27 (21-Geologist + 3-Geophysicist + 2-Rs & GIS + 1-Hydrogeologist)

Total no. of Projects funded by NMEDT: 11

Approved - 11

Completed - 6

Ongoing - 5

Comments of Nodal Personnel (Agency), if any:

Certification

I hereby certify that the above checklist has been duly completed and all verifications have been carried out as per the guidelines.

Signature of Nodal Personnel (Agency):

Name: P. Praveen Kumar

Designation: Director

Date: 09.04.2026