

DETAILED PROPOSAL REPORT (DPR)
**FOR RECONNAISSANCE SURVEY FOR VANADIUM BEARING
TITANIFEROUS ALUMINOUS LATERITE IN BILALPUR BLOCK
(G4-STAGE) (47 SQ.KM), SANGAREDDY DISTRICT, TELANGANA.**

COMMODITY: VANADIUM, TITANIUM AND GALLIUM



By

**M/S GMMCO Technology Services Ltd (GTS)
Hyderabad, Telangana**

CKA Birla Group | GTS

FOR SUBMITTING DPR FOR UNDERTAKING PRELIMINARY EXPLORATION

From:	To:
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2) Detail of Accreditation as Private Exploration Agencies and Notification under the Provision to Section 4(1) of the MMDR Act.		
(a)	Date of accreditation granted by QCI-NABET	20th May - 2024
(b)	Date of expiry of accreditation	15th May - 2027
(c)	Date of Notification under the provision to Section4(1) of the MMDR Act.	13 th Sept - 2024
(d)	Date of expiry of notification	12 th Sept - 2027
(e)	Category of the Exploration agency (Category A or B) under Notification	Category - A

3) Location details of the area proposed				
(a)	State	Telangana		
(b)	District(s)	Sangareddy		
(c)	Nearby village(s)	Ghodgarpalle, Bilalpur and Parsapalle		
(d)	Survey of India Toposheet No(s)	56G/10		
(e)	Area in Sq. Km	47 Sq. Km		
(f)	Boundary co-ordinates of the Proposed Block (in Decimal Degree)	Corner points	Latitude	Longitude
		A	17°32'18.62"N	77°37'38.29"E
		B	17°35'17.52"N	77°36'23.37"E
		C	17°35'35.64"N	77°41'56.67"E
		D	17°33'29.95"N	77°42'42.77"E
		E	17°33'28.19"N	77°40'30.95"E
		F	17°32'37.54"N	77°40'29.14"E
		G	17°32'30.89"N	77°38'39.36"E
		H	17°31'50.98"N	77°38'40.99"E

4) Mineral Potential of the area		
(a)	Name of Mineral(s) identified/expected in the area/block	Vanadium bearing Titaniferous Aluminous Laterite
(b)	Title of the Project	Bilalpur Block
(c)	Stage of Exploration	G-4
(d)	Basis on which mineral potential of the area has been identified	Please refer enclosed "Summary proposal"
5) Documents enclosed with the application		
(i)	Location of the proposed block demarcated on Survey of India (SOI) Toposheet No.56G/10	
(ii)	Documents mentioned in item 4(d) above.	

Signature of the applicant



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Place: Hyderabad

Date: 08.05.2026

Summary of the Block

Reconnaissance Survey for Vanadium bearing Titaniferous Aluminous Laterite in Bilalpur Block (G4-stage) (47 Sq.Km), Sangareddy District, Telangana

S.No	Features	Details		
	Block ID	Bilalpur Block		
	Exploration Agency	M/s GMMCO Technology Services Limited Hyderabad, India.		
	Commodity	Vanadium bearing Titaniferous Aluminous Laterite		
	Mineral Belt	Deccan trap volcanism		
	Completion Period with entire Time schedule to complete the project	Ten (10) months		
	Objectives	1) To target the aluminous laterite for V, Ti, and Ga mineralization over Deccan Trap provenance. 2) To carry out detailed geological mapping of the 47 sq km block on 1:12,500 scale for delineating potential zones for V, Ti, and Ga mineralization. 3) To undertake systematic grab, channel, and groove sampling of bedrock from identified favorable and mineralized zones. 4) To assess and establish G-4 category (UNFC code 334) reconnaissance-level prospects for Vanadium, Titanium, and Gallium within the block, in accordance with UNFC norms and the Minerals (Evidence of Mineral Contents) Rules.		
	Whether the work will be carried out by the proposed agency	M/s GMMCO Technology Services Limited Hyderabad, India		
	Name/Number of Geoscientists	Two Senior Geologists		
	Expected Field days (Geology) Geological Party Days	Two Senior Geologists - 200 days (2x100 days)		
1.	Location			
	Latitude and Longitude	Corner points	Latitude	Longitude
		A	17°32'18.62"N	77°37'38.29"E
		B	17°35'17.52"N	77°36'23.37"E
		C	17°35'35.64"N	77°41'56.67"E
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		G	17°32'30.89"N	77°38'39.36"E
		H	17°31'50.98"N	77°38'40.99"E
	Villages	Ghodgarpalle, Bilalpur, Billapur and parsapalle		
	Tehsil /Taluk	Kohir Mandal		
	District	Sangareddy		
	State	Telangana		
2.	Area (hectares/square kilometers)			
	Block Area	47 Sq.Km		
	Forest Area	Nil		
	Government Land Area	Nil		
	Private Land Area	Data not available		

3.	Accessibility	
	Nearest Rail Head	Medak Railway station
	Road	The village Bilalpur is located in Kohir Mandal of Sangareddy District in the State of Telangana in India. The nearest town is Zahirabad, which is about 22 kilometers away from Bilalpur.
	Airport	The nearest airport is Rajiv Gandhi International Airport (RGIA), Hyderabad
4.	Hydrography	
	Local Surface Drainage Pattern (Channels)	The proposed area represents a plateau geomorphic setting characterized by an undulating terrain, with a moderately to highly dissected upper plateau developed in the north-western part of Toposheet No. 56G/10. The regional physiography and drainage pattern, governed by prevailing tropical climatic conditions, have played a significant role in the development of laterite cover and the residual enrichment of alumina, primarily through prolonged processes of chemical weathering, oxidation, and leaching.
	Rivers/Streams	Small 2nd order Nalas present in proposed area
5.	Climate	
	Mean Annual Rainfall	Sangareddy district, part of Telangana's Central Telangana Zone, receives an average annual rainfall of around 978 mm
	Temperatures (December) (Minimum) Temperatures (June) (Maximum)	Tropical climate with hot summers, mild winters, and southwest monsoon rainfall.
6.	Topography	
	Toposheet Number	56G/10
	Morphology of the Area	The proposed area is gentle undulations and low-lying areas
7	Availability of baseline geosciences data	
	Geological Map (1:50K/25K)	Regional Geological Map - GSI (1:50,000 scale)
	Geochemical Map	NGCM data available
	Geophysical Map (Aeromagnetic, ground geophysical, Regional as well also Local scale GP maps)	NGDR
8.	Justification for taking up Reconnaissance Survey / Regional Exploration	In the proposed block GSI (2024) reported significant geochemical variability in laterites of Toposheet No. 56G/10, with Al ₂ O ₃ up to 34.63%, Fe ₂ O ₃ up to 37.24%, TiO ₂ up to 8.55%, and vanadium enrichment up to 2023 ppm. These values reflect intense lateritisation and residual concentration of alumina and associated elements. The mineralization in the proposed block is genetically related to intense lateritisation of Deccan Trap basalts, leading to residual enrichment of aluminum and iron with concomitant concentration of vanadium, titanium, and gallium. Field surface evidence of lateritic development was also recorded during the reconnaissance field traverses in the proposed block. The presence of aluminous laterite indicates favorable conditions for V-Ti-Ga and allied critical minerals, mitigating systematic G-4 stage reconnaissance exploration under UNFC norms.

Detailed Summary of the Block

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1. Detailed Block Summary

Introduction

The Laterite and bauxite formations developed under tropical climatic conditions constitute important repositories of aluminium and associated critical elements such as vanadium, titanium, and gallium. Recent reconnaissance and resource evaluation studies in parts of Telangana, notably the Zaheerabad, Sangareddy region, have demonstrated significant potential of aluminous laterite and bauxite with appreciable enrichment of vanadium and allied elements, highlighting the strategic importance of such deposits.

The proposed block, located in Toposheet No. 56G/10 (Plate-2), exhibits comparable geomorphological, lithological, and geochemical characteristics, including well-developed lateritic profiles and favourable oxide assemblages. Preliminary data generated by GSI (2024) indicate elevated Al_2O_3 , Fe_2O_3 , TiO_2 , and vanadium values, suggesting a promising environment for critical mineral accumulation. In this context, the present proposal aims to undertake systematic G-4 stage reconnaissance exploration to evaluate the aluminous laterite bauxite V-Ti-Ga potential of the area in accordance with UNFC norms and the Minerals (Evidence of Mineral Contents) Rules.

Location and details of the area

The proposed block falls in the survey of India toposheet No. 56G/10 in the administrative jurisdiction of Sangareddy District, Telangana (Plate-1). The area forms part of Khoir, Mandal, where laterite is exposed. The nearest town is Zahirabad, which is about 22 kilometers away from Bilalpur.

Physiography

Toposheet No. 56G/10 is characterised by a plateau-dominated physiography with gently to moderately undulating terrain, developed as part of the Deccan plateau region. The area comprises laterite-capped uplands, intervening shallow valleys, and locally dissected plateau remnants, reflecting prolonged subaerial exposure and tropical weathering.

Elevation varies moderately across the toposheet, with higher ground forming subdued plateaus and lower elevations marked by seasonal nalas and minor drainage channels. The drainage pattern is predominantly dendritic to sub dendritic, controlled by regional slope and structural weaknesses, and exhibits a moderate to high degree of dissection in places. The combined influence of physiography, drainage, and tropical climatic conditions has favoured intense lateritisation and residual concentration of alumina and associated elements, making the area conducive for aluminous laterite bauxite and allied critical mineral occurrences.

Regional Geological set-up

The proposed block lies along the eastern margin of the Deccan Traps (Plate-1), a vast continental flood basalt province emplaced during the Late Cretaceous (~67–65 Ma). The Deccan volcanism represents one of the largest volcanic events on Earth, comprising extensive, step-like basaltic lava flows with cumulative thickness reaching several thousand metres and aerial extents exceeding 1,000 km across peninsular India. Studies by Chenet et al. (2007, 2008) recognise three major phases of volcanism, with the voluminous Phase-2 coinciding with the Cretaceous–Tertiary Boundary (KTB), highlighting the global significance of this magmatic episode.

Prolonged tropical subaerial exposure of the Deccan basalts under warm and humid climatic conditions has resulted in intense chemical weathering, leading to the development of thick lateritic profiles. Laterite, characterised by enrichment of Fe and/or Al and depletion of Si, forms a residual product of advanced weathering of basaltic parent rocks (Schellmann, 1986). Although classification of laterite based on $\text{SiO}_2\text{-Al}_2\text{O}_3\text{-Fe}_2\text{O}_3$ system is widely adopted, subsequent studies indicate that lateritic duricrusts may contain both autochthonous and allochthonous components, complicating strict genetic interpretations (Bourman&Ollier, 2002; Widdowson, 2008).

In the local geological context, the lateritic profiles exhibit a systematic upward increase in degree of weathering, marked by development of saprolite, core-stone horizons, mottled zones, and ferruginous/aluminous duricrust caps, with fresh basalt encountered at depths exceeding 30- 40 m. Such well-developed lateritisation has facilitated residual concentration of alumina, iron, titanium, vanadium and allied elements, making the Deccan Trap-hosted laterites of the area favourable targets for aluminous laterite bauxite and critical mineral exploration. The geological setting thus provides a strong rationale for undertaking G-4 stage reconnaissance investigations in the proposed block under UNFC and MEMC Rules.

Regional Stratigraphy

The regional geological framework is dominated by Archaean granitoid-gneissic assemblages, comprising granite, adamellite, granodiorite, quartz-monzonite, alkali feldspar granite, quartz syenite, and alkali feldspar granite, collectively forming a composite batholith with diapiric emplacement (Condie, 1981). These granitoids constitute more than 80% of the area and enclose enclaves of amphibolite and banded gneiss, referred to as Gneiss-I, derived from tonalite, granodiorite, diorite, and amphibolite protoliths and metamorphosed under amphibolite facies conditions (Sarvothaman et al., 1983). Subsequent deformation and metamorphism of quartz-monzonite, adamellite, and granite under greenschist facies conditions led to the development of Gneiss-II assemblages (Sarvothaman et al., 1983). Alkali feldspar granites, representing the youngest phase of granitic intrusion, transect all earlier litho-units. The basement complex is intruded by multiple generations of basic dykes, including amphibolitic, doleritic, and pyroxenitic dykes, emplaced both prior to and subsequent to alkali feldspar granite intrusion. Pegmatite and quartz veins/reefs cut across all lithological units.

The Deccan Trap volcanic sequence, comprising five basaltic flows, unconformably overlies the Archaean gneiss–granite complex, with conglomeratic horizons marking the basal unconformity. Intertrappean beds, predominantly chert with subordinate marl, occur between the lower basalt flows, notably between Flows I-II and III–IV. The volcanic sequence is capped by laterite, formed due to prolonged subaerial weathering under tropical climatic conditions.

Table.1 Regional stratigraphy of the proposed area (Source - GSI)

Group	Lithology
DECCAN TRAP	Laterite Basalt flow No. V Intertrappean bed-D: Chert Basalt flow No. IV Intertrappean bed-C: Chert with marl Basalt flow no. III Intertrappean bed-B: Chert with marl Basalt flow no. II Intertrappean bed-A: Chert with marl Basalt flow no. I Infratrappean bed: Conglomerate
----- Unconformity-----	
ARCHAEAN GNEISSGRANITE COMPLEX	Granitiods

Geology of the Block

The proposed block is underlain by Cenozoic laterite formations developed over Late Cretaceous-Palaeocene basaltic flows of the Deccan Traps (Sahyadri Group), along with associated intertrappean beds comprising chert and chert with marl. The laterites represent the products of intense chemical weathering of basalt under tropical climatic conditions, leading to residual enrichment of iron, alumina, and associated elements. Consequently, the lithological assemblage within Toposheet No. 56G/10 is dominated by Deccan Trap basalts, intertrappean sediments, and lateritic caps (Plat-4).

Four younger basalt flows, designated Flows II, III, IV, and V (Table 1), are recognised in the area. These flows are sub-horizontal to horizontal, laterally extensive, and exhibit typical ‘Aa’ type basaltic characteristics, including thick massive cores, locally developed columnar jointing, rough and rubbly upper surfaces, and highly vesicular flow tops. Vesicles, ranging in size from 1 mm to 10 mm, are commonly infilled with secondary minerals such as calcite, zeolite, drusy quartz, and chalcedony. Individual flows are distinguished on the basis of their fragmental and vesicular flow tops, weathering characteristics, joint patterns, and intervening intertrappean horizons. Laterite occurs both as isolated cappings and as extensive blanket deposits over the trap flows, with profile thickness varying from 1 m to 30 m. Parts of Flows II and III have undergone advanced lateritisation, producing vermicular, hard, massive, and concretionary laterite. The laterite exhibits colour variations from brick red and reddish-brown to dark greyish red, reflecting differences in degree of weathering and iron enrichment.

Scope for proposed exploration

The proposed exploration programme aims to undertake G-4 stage reconnaissance investigation to assess the aluminous laterite bauxite potential and associated critical minerals (V, Ti, and Ga) within the block. The scope includes systematic geological and structural mapping to delineate laterite cover, basalt flows, intertrappean horizons, and favourable geomorphic domains controlling lateritisation and mineral enrichment.

Detailed surface sampling (grab, channel, and groove) will be carried out from laterite profiles, bauxite horizons, and mineralised zones to evaluate the spatial and vertical variation of Al_2O_3 , Fe_2O_3 , TiO_2 , V, and Ga. Limited shallow subsurface investigations, wherever feasible, will be undertaken to understand laterite thickness, profile development, and grade continuity. The exploration will generate baseline geological, geochemical, mineralogical, and analytical data to identify promising zones, establish G-4 category (UNFC code 334) prospects, and provide a scientific basis for subsequent G-3 stage detailed exploration.

Mineral Potentiality based on Geology

Mineralisation within the proposed block is closely associated with intense lateritisation of Deccan Trap basalts, which has resulted in the residual concentration of aluminium and iron, along with enrichment of vanadium, titanium, and gallium. During prolonged tropical weathering, silica and alkalis were leached, while relatively immobile elements such as Al, Fe, Ti, and V became progressively concentrated within the lateritic profile. Vanadium is preferentially enriched through adsorption and substitution within iron oxides and hydroxides, whereas titanium occurs largely as resistant Ti-bearing phases and as lattice-bound components within the weathered basalt. Gallium, owing to its geochemical affinity with aluminium, is commonly incorporated within aluminous laterite and bauxite horizons. The development of thick, mature lateritic profiles, particularly overflows II and III, thus provides favourable conditions for the formation of Al-V-Ti-Ga bearing laterite and bauxite, warranting systematic G-4 stage reconnaissance evaluation.

2. Previous Work

Systematic geological investigations in and around the proposed block have been carried out by various agencies, primarily the Geological Survey of India (GSI), from time to time (Plate-4). Early regional geological mapping established the presence of Deccan Trap basalts, intertrappean sediments, and lateritic caps, and delineated the broad stratigraphic framework of the area. These studies recognised extensive lateritisation of basaltic flows, particularly over plateau surfaces, indicating favourable conditions for the development of aluminous laterite and bauxite.

During 2022-23, GSI carried out reconnaissance level investigations in the Zaheerabad, Sangareddy region, involving large-scale geological mapping, trenching, and systematic geochemical sampling of laterite and bauxite profiles. The studies reported significant Al_2O_3 enrichment, appreciable TiO_2 and Fe_2O_3 contents, and notable vanadium concentrations, leading to the estimation of substantial inferred resources of bauxite, aluminous laterite, and vanadium. Mineralogical studies

confirmed the presence of kaolinite, hematite, goethite, and ilmenite, highlighting advanced lateritisation processes.

Gundani, GSI (2024) generated geochemical data from laterite occurrences in Toposheet No. 56G/10, reporting wide compositional variability with Al₂O₃ values up to ~35%, TiO₂ up to ~8.5%, and vanadium concentrations reaching ~2000 ppm. However, no systematic G-4 stage exploration has been undertaken within the present block to evaluate the lateral continuity, thickness variation, and critical mineral potential of the laterite profiles. The existing data thus provide a strong baseline and justify the need for proposed reconnaissance-level exploration in the block.

3. Block description

Table.2 Coordinates of the proposed block

Corner points	Latitude	Longitude
A	17°32'18.62"N	77°37'38.29"E
B	17°35'17.52"N	77°36'23.37"E
C	17°35'35.64"N	77°41'56.67"E
D	17°33'29.95"N	77°42'42.77"E
E	17°33'28.19"N	77°40'30.95"E
F	17°32'37.54"N	77°40'29.14"E
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Field evidence

The committee recommended a field visit to the north-western part of the area to verify the occurrence of basalt or laterite, as the 1:50,000 scale geological map indicates the presence of basalt in this region. Accordingly, field investigations were carried out in the Bilalpur proposed block (Table 3).

The field observations (Fig; 2, 3, 4, 5) reveal that the area is predominantly covered by well-developed laterite profiles with thickness ranging from about 5 m to 25 m across the block. In some locations, particularly in dug wells, the laterite profile exceeds 25 m thickness, indicating intense lateritization and prolonged weathering processes in the region. A representative laterite profile exposed in a dug well is shown in Fig.5.

Preliminary on-site geochemical analysis using a handheld XRF analyzer was carried out on selected samples (Fig.3). The results indicate relatively high concentrations of Aluminium (Al), Titanium (Ti), and Vanadium (V) within the laterite horizon.

These observations suggest that the lateritic cover in the Bilalpur block may have potential for aluminium-rich lateritic mineralization, and the area warrants systematic exploration to evaluate the grade, thickness, and lateral continuity of the mineralized laterite profile.

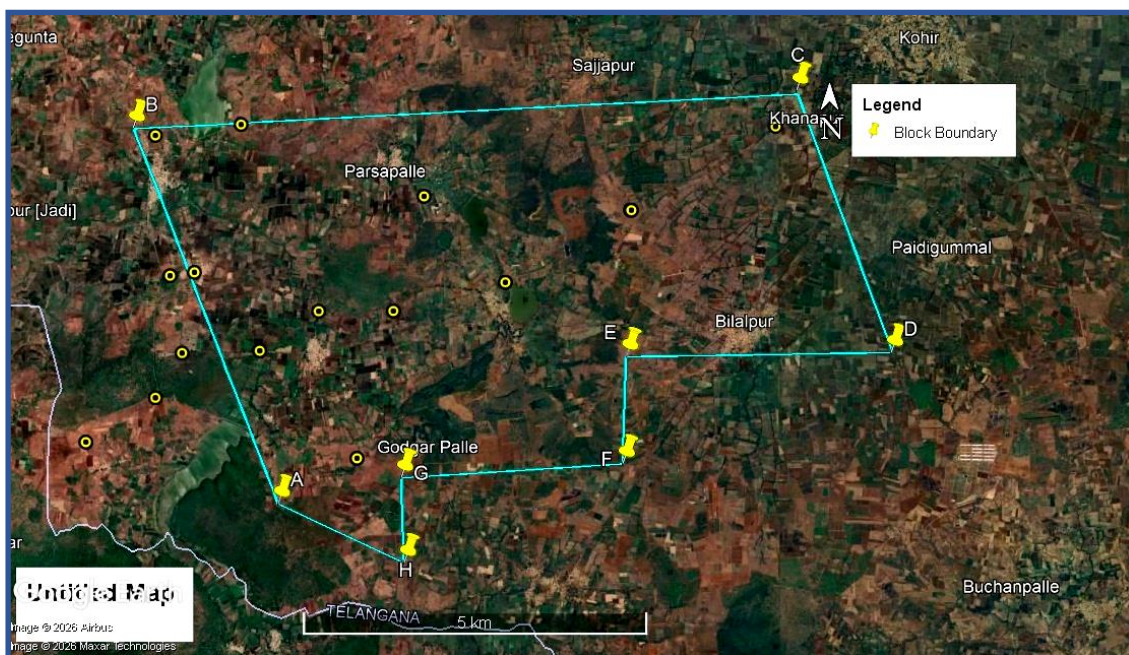


Figure 1. Field evidence of laterite exposures (yellow colour) plotted on the Google Earth map within the proposed Bilalpur Block.



Figure 2. Field photograph of laterite profile in the proposed block

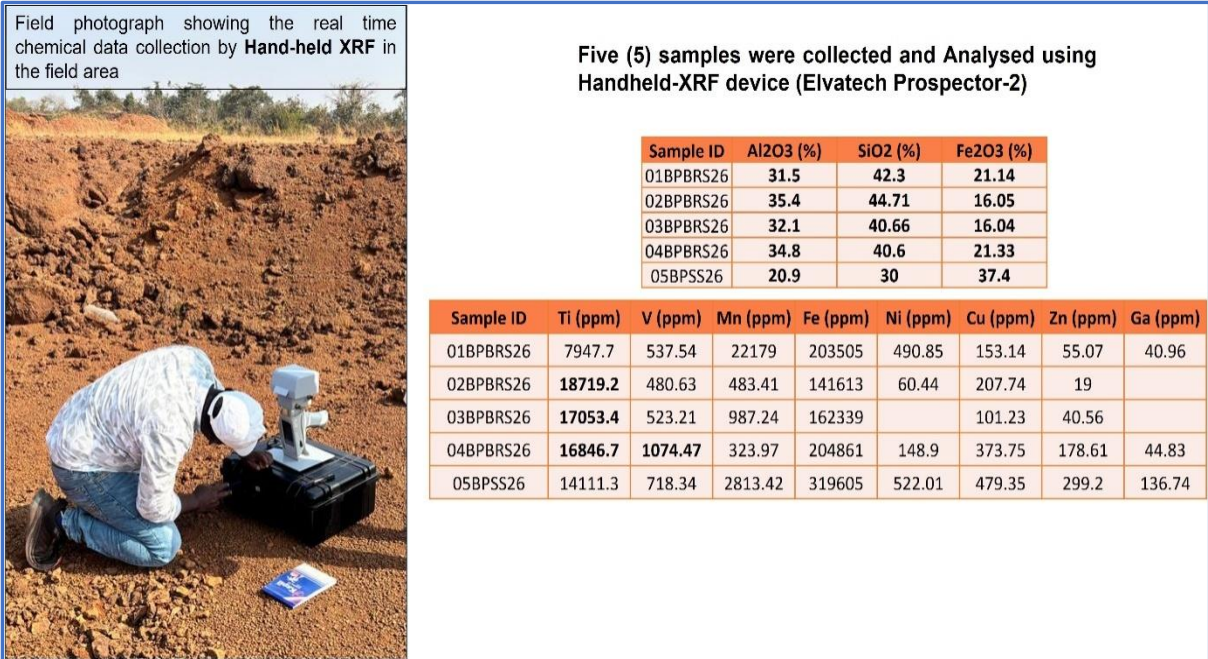


Figure-3: Field photograph of laterite and its analytical results obtained by handheld XRF.

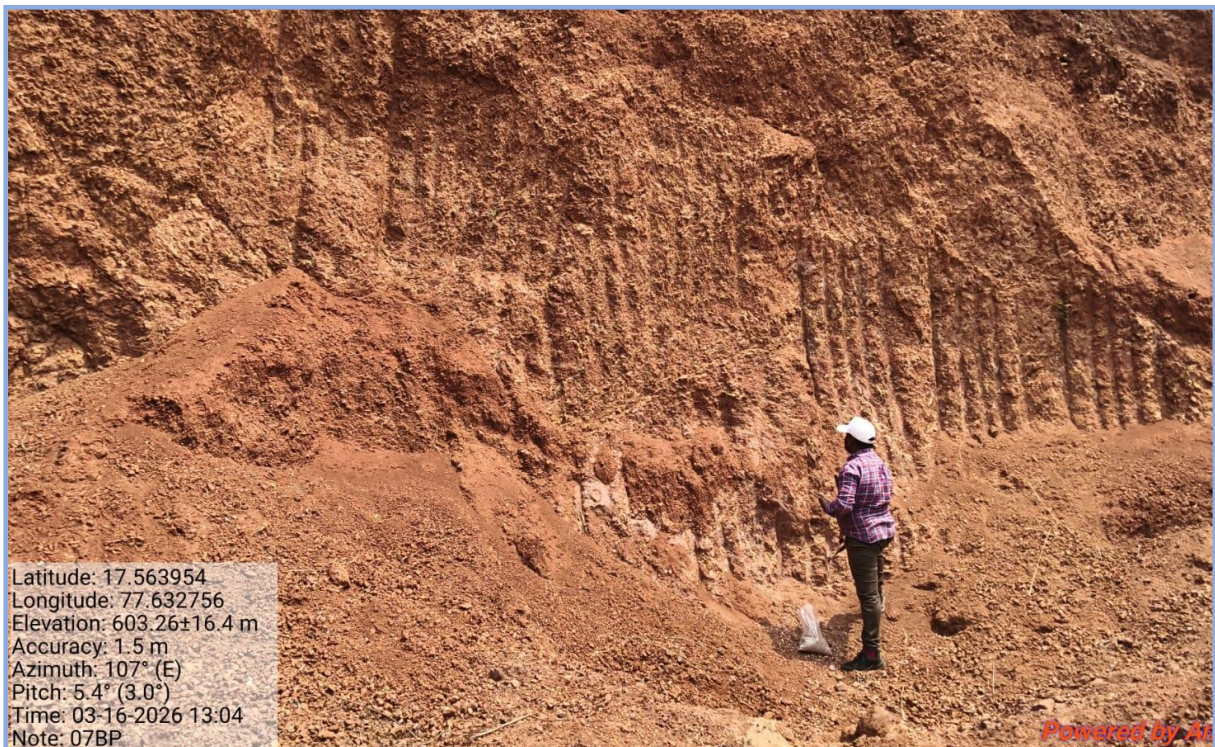


Figure 4. Field photograph showing the laterite profile exposed near Venkatapur village

Field Sample Details

A total of 16 field samples were collected from different locations across the Bilalpur proposed block for analysis. The sample locations, coordinates, lithology, and field remarks are summarized in **Table 3**.

Table 3. Field samples details

S.No	Sample	Lat N	Long E	Rock Type	Description/Remarks
1	01/BP/26	17°35'18.71"	77°41'46.48"	Reddish Soil sample	Near Khanapur Village
2	02/BP/26	17°34'38.45"	77°40'33.67"	AL-Laterite	Badampet
3	03/BP/26	17°34'38.41"	77°40'34.09"	Saprolite	Badampet
4	04/BP/26	17°34'04.04"	77°39'31.11"	Laterite	Near Badampet
5	05/BP/26	17°33'50.37"	77°38'35.22"	Reddish Lateritic soil	Gotigarpally
6	06/BP/26	17°33'50.23"	77°37'57.92"	AL-Laterite	Forest pillar Gotigarpally
7	07/BP/26	17°32'40.58"	77°38'17.85"	AL-Laterite	South of Gotigarpally, Dug well 25m depth
8	08/BP/26	17°33'31.38"	77°37'28.71"	Black soil	Paddy field/Fertile nature/ Low lying area
9	09/BP/26	17°33'30.29"	77°36'50.10"	Laterite	Reddish/Weathered nature-West side the of BB
10	10/BP/26	17°32'48.13"	77°36'03.12"	Laterite	Venkatpur Gate
11	11/BP/26	17°34'08.82"	77°36'55.62"	Laterite	Malchalma Thanda
12	012/BP/26	17°34'07.09"	77°36'43.76"	Laterite	Darga/Paly ground, Malchalma Thanda X road
13	013/BP/26	17°35'14.54"	77°36'35.11"	Fe/Al-Laterite	Dump yard, Malchelma
14	014/BP/26	17°35'19.83"	77°37'18.08"	Laterite	East of Malchelma cheruvu
15	015/BP/26	17°34'45.24"	77°38'50.24"	Laterite	SE of Parsapalle village



Figure 5. Field photograph showing the laterite profile exposed in a dug well near South of Gotigarpally village

The geochemical analysis of fifteen samples from the Bilalapur block (Table 4), carried out using handheld XRF, reveals significant enrichment of iron, aluminium, and economically important trace elements within the lateritic profile. These findings strongly justify advancing the area to a G4 stage (reconnaissance level) investigation.

The major oxide data indicate a well-developed lateritic profile characterized by low silica (8.5-17.8%), moderate to high alumina (15.1–32.2%), and very high iron oxide content (24.1-54.9%). The depletion of SiO_2 and enrichment of Fe_2O_3 and Al_2O_3 clearly indicate intense lateritization under prolonged tropical weathering conditions. Such geochemical signatures are typically associated with ferruginous laterite of economic significance.

The presence of Al-rich zones, particularly in Al-laterite and saprolite samples (e.g., 02BP and 03BP), suggests the possibility of localized bauxitic enrichment. Although the alumina content does not uniformly reach economic grade, the observed values indicate favorable conditions for further detailed exploration.

Trace element data further strengthen the economic prospects of the study area. Vanadium concentrations (490-1363 ppm) show a strong correlation with iron-rich samples, indicating its association with Fe-oxide phases. Manganese enrichment, with values up to 5529 ppm, highlights localized zones of secondary concentration, which may also have economic implications.

Nickel concentrations reach up to 567 ppm, while chromium values are as high as 963 ppm. The spatial distribution of these elements, coupled with lithological variations (laterite, Al-laterite, Fe/Al-laterite, and saprolite), indicates a heterogeneous but mineralogically prospective lateritic profile. Such variability suggests the presence of geochemical zoning, which is a favorable indicator for targeted mineral exploration.

Table 4. Analytical Results of Bilapur Block (Handheld XRF)

Sample	Latitude	Longitude	Lithology	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	TiO ₂	V	Ga	Sc	Cr	Mn	Ni
				%				PPM					
01BP	17°35'18.71"	77°41'46.48"	Reddish Soil	17.2	22.1	31.9	6.8	878.8		95.5	299.5	1788.4	194.7
02BP	17°34'38.45"	77°40'33.67"	AL-Laterite	17.3	32.2	27.3	2.4	735.9	55.9	58.0	264.4	397.0	107.4
03BP	17°34'38.41"	77°40'34.09"	Saprolite	17.8	31.2	27.2	3.0	490.7	36.7	85.7	82.6	354.3	121.2
04BP	17°34'04.04"	77°39'31.11"	Laterite	10.1	18.5	49.8	4.3	1254.3	156.3	132.7	534.0	1481.6	567.7
05BP	17°33'50.37"	77°38'35.22"	Lateritic soil	9.9	17.5	47.4	5.9	1313.0	87.1	206.3	179.7	2182.0	240.8
06BP	17°33'50.23"	77°37'57.92"	AL-Laterite	16.9	30.0	28.2	4.6	1099.6	51.6	96.0	71.1	2135.4	36.8
07BP	17°32'40.58"	77°38'17.85"	AL-Laterite	8.8	15.5	54.8	2.7	1015.1	52.6	60.0	963.0	3885.0	468.7
08BP	17°33'31.38"	77°37'28.71"	Black soil	9.9	15.1	50.4	5.4	1363.7	NA	107.0	375.4	3686.5	507.3
09BP	17°33'30.29"	77°36'50.10"	Laterite	13.3	17.2	40.9	3.4	802.8	165.8	46.0	133.4	5529.2	329.3
10BP	17°32'48.13"	77°36'03.12"	Laterite	14.6	26.0	37.0	3.7	1093.7	49.4	106.8	365.4	484.0	NA
11BP	17°34'08.82"	77°36'55.62"	Laterite	17.4	30.1	24.1	7.1	529.4	56.6	58.0	82.3	3080.7	NA
12BP	17°34'07.09"	77°36'43.76"	Laterite	15.7	26.3	34.4	4.3	750.7	92.2	120.0	85.8	1873.2	NA
13BP	17°35'14.54"	77°36'35.11"	Fe/Al-Laterite	8.5	15.7	54.9	4.3	1332.9	132.1	59.0	172.2	1493.8	330.4
14BP	17°35'19.83"	77°37'18.08"	Laterite	10.0	19.1	48.0	3.9	1352.6	117.8	65.0	285.4	1440.2	408.7
15BP	17°34'45.24"	77°38'50.24"	Laterite	10.3	19.3	47.5	4.6	1111.7	169.9	89.0	202.3	1358.4	426.6

4. Planned Methodology

The proposed investigation will be carried out at the G-4 (Reconnaissance) stage through an integrated programme of surface mapping, sampling, and laboratory studies, aimed at generating UNFC-compliant baseline data in accordance with the Minerals (Evidence of Mineral Contents) Rules.

i) Geological and Structural Mapping

Detailed geological and geomorphological mapping on 1:12,500 scale will be undertaken to delineate laterite cover, basalt flows (II-V), Intertrappean horizons, and associated structural features such as fractures, joints, lineaments, and flow contacts that influence lateritisation and mineral enrichment.

ii) Surface Sampling

Systematic grab, channel, and groove sampling will be carried out from laterite profiles, bauxite horizons, vesicular flow tops, and other favourable zones. Sampling will be designed to assess lateral and vertical variation in Al_2O_3 , Fe_2O_3 , TiO_2 , V, and Ga content.

iii) Subsurface Investigation

Limited shallow pits/trenches, wherever feasible, will be excavated to study laterite thickness, profile development, and grade variation with depth, and to collect representative samples from different horizons.

iv) Laboratory Analysis

Selected samples will be analysed for major oxides by XRF and trace and critical elements by ICPMS. Petrographic, ore microscopic, SEM-EDX, and XRD studies will be carried out to characterise mineralogy, textural relationships, and host rock–mineral associations.

v) Data Integration and Assessment

All geological, geochemical, and mineralogical data will be integrated to delineate favourable zones and assess the G-4 category (UNFC code 334) potential of aluminous laterite-bauxite and associated V-Ti-Ga mineralisation, providing a scientific basis for recommending G-3 stage detailed exploration.

5. Nature Quantum and Target

The following work components are proposed for the reconnaissance (G- 4) stage exploration programme in the proposed block:

Table. 5 Proposed works in Bilalpur Block

S. No	Activities	Unit	Proposed Target
1	Geological Mapping (on 1:12,500 Scale)	Sq. Km	47
2	Excavation of Pit and Trench (PT)	Cu m	20
3	Drilling (4 boreholes – 25m each)	Meters	100
	Sampling		
4	Bedrock	Nos.	100
5	Pitting	Nos.	
6	Drilling (4 holes)	Nos.	
7	Chemical Analysis	Nos.	132
8	Laboratory studies		
9	a) Thin sections	Nos.	10
10	b) Polished sections	Nos.	10
11	Report Preparation (5 Hard copies with a soft copy)	Nos.	1
12	Preparation of Exploration Proposal	No's	1

6. Manpower deployment

The following manpower is proposed for systematic execution of the G-4 stage exploration programme in the Bilalpur block:

Table .6 Proposed manpower deployment

S.No	Category	Number	Role / Responsibility
1	Geologists	2	Overall supervision, planning and execution of geological mapping, structural studies, and data integration
2	Field Labour	4	Collection, labelling, preparation, and dispatch of bedrock, trench and pit
3	Sampler	1	Collection, labelling, preparation, and dispatch of bedrock, trench, pit, and core samples.
4	Supporting Labour for sample collection	2	Assist sampler in sample collection, handling, and processing.

7. Time Schedule for Reconnaissance survey

The proposed Reconnaissance survey for Vanadium bearing Titaniferous Aluminous Laterite in Bilalpur Block (G4-stage) (47 Sq.Km), Sangareddy District, Telangana; Schedule timeline: Ten (10) months. The work schedule has been designed to ensure systematic progression from surface investigations to limited sub-surface evaluation and data integration.

Table .7 Proposed time schedule

Time Schedule - Proposal for Reconnaissance Survey for Vanadium bearing Titaniferous Aluminous Laterite in Bilalpur Block, Sangareddy District, Telangana (G4-Stage & 47 Sq.Km) No.of BH:04 (25m depth each); Schedule timeline: Eight (10) months															
S. No	Activity	Unit	Months												
			1	2	3	4	Review-1	5	6	7	8	Review-2	9	10	
1	Camp Establishment	Months	■												
2	Geological mapping	Months		■	■	■									
3	Sampling (BRS, Pitting)	Months	■	■	■										
4	Sampling analysis (BRS, Pitting)	Months		■	■	■									
5	Survey (Boundary points and Drill collars)	Months			■	■									
6	Scout Drilling	Months						■	■						
7	Core logging & sampling	Months						■	■						
8	Sampling analysis (Drill core samples)	Months								■	■				
9	Laboratory analysis (Petrography & SEM)	Months								■	■				
10	Camp winding	Months											■		
11	Report preparation and submission	Months											■	■	

8. Break-up of expenditure

Table .8 Proposed cost estimates

Cost Estimate - Reconnaissance survey for Vanadium bearing Titaniferous Aluminous Laterite in Bilalpur Block (G4-stage) (47 Sq.Km), Sangareddy District, Telangana Schedule timeline: Ten (10) months		
S. No.	Item of Work *	Estimated Cost Total Amount (Rs)
A	Geological Mapping and Survey work	35,03,178
B	Pitting & Drilling	9,50,000
C	Chemical Analysis	6,92,800
D	Laboratory Studies	
E	Geological Report Preparation (5 Hard copies with a soft copy)	2,50,000
F	Preparation of Exploration Proposal	1,02,920
G	Peer Review	30,000
H	Total Estimated Cost without GST	55,28,898
I	Provision for GST (18% of G)	9,95,202
J	Total Estimated Cost with GST	65,24,099
Rs. in Lakhs		65.24

9. Details Break-up of expenditure

Table .9 Detailed break-up of expenditure

Reconnaissance survey (G4) for Vanadium bearing Titaniferous Aluminous Laterite in Bilalpur Block, Sangareddy District, Telangana. Total Block Area- 47 sq.km, Completion time- 10 months, Review-4 months and 8- months; Drilling 100m in 4 BHs (25 m each) Implementing Agency: GMMCO Technology Services Limited							
S. No.	Item of Work *	Unit *	Rates as per NMET SoC 2025		Estimated Cost of the Proposal		Remarks
			SoC-Item No.	Rates as per SoC (a)	Qty. (b)	Total Amount (Rs) (a*b)	
A	Geological Mapping Other Geological Work & Surveying						
i	Geological mapping, (1:12,500 scale)	Sq.km	1.1	18,300	47	8,60,100	
ii	Charges for Geologist per day (Field) for geological mapping & trenching work	day	1.2.1a	14,500	120	17,40,000	
iii	Charges for Geologist per day (HQ)	day	1.2.1a	10,500	30	3,15,000	
iv	Labours Charges for geologist	day	5.8	541	240	1,29,840	Amount will be reimbursed as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher.
v	Charges for one Sampler per day (1 Party)	one sampler per day	1.2.1b	7,850	17	1,33,450	
vi	Labours (4 Nos)	Per day	5.8	541	68	36,788	Amount will be reimbursed as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher.
vii	Surveyor for topographic survey/DGPS Survey and for BH fixation & RL determination (4 BH plus 8 Boundary points)	Per Point of observation	1.3.2	24000	12	2,88,000	
	Sub Total- A					35,03,178	
B	Trenching/Pitting						
1	Pitting	per cu.m	2.1.2	4,725	20	94,500	1mX1mX1m
2	Drilling (Inhouse)	per m	2.2.1.1c	5,500	100	5,50,000	4BHs 25 m each

3	Land / Crop Compensation (in case the BH falls in agricultural Land)	per BH	5.6	30,000	4	1,20,000	As per actuals as certified by local authorities subject to a maximum of 30,000 per bore hole
4	Construction of concrete Pillar (12"x12"x30")	Per borehole	2.2.7	2,000	4	8,000	
5	Borehole plugging by cement	Lum sum per borehole	2.2.8	10,000	4	40,000	
6	Miscellaneous Charges (Transportation of Drilling Rig, Accommodation for Drill Camp, Camp setting and winding, construction of Approach Road and Drill core preservation)	Drilling cost	2.2.9	0.25		137500	1. For Drilling cost less than 50 Lakhs: 25% of the Drilling Cost
	Sub Total- B					9,50,000	
C	LABORATORY STUDIES						
1	Chemical Analysis						
i	Geochemical Analysis						
	Major oxides (WD XRF)- (oxides+ traces -24 elements)	Per Sample	4.1.17a	4,200	100	4,20,000	PS:20; CS:80
	External Check (10%)	Per Sample	4.1.17a	4,200	10	42,000	
	Analysis of Minor, Trace RM and REE elements by ICPMS	Per Sample	4.1.15	7,400	20	1,48,000	
	External Check (10%)	Per Sample	4.1.15	7,400	2	14,800	
ii	Physical & Petrological Studies						
iii	Preparation of thin section	Per Sample	4.3.1	500	10	5,000	
iv	Study of thin section	Per Sample	4.3.4	2800	10	28,000	
v	Preparation of polish section	Per sample	4.3.3	700	10	7,000	
vi	Study of polish section	Per sample	4.3.4	2,800	10	28,000	
	Sub Total C					6,92,800	
	Total A to C					51,45,978	
D	Geological Report Preparation	5 Hard copies with a soft copy	5.2	Total cost exceeding 50 lakh but less than 150 lakh. 2.5 lakh		2,50,000	
E	Peer review Charges	As per EC decision				30,000	
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. 5.0 Lakhs whichever is less		1,02,920	
G	Total Estimated Cost without GST					55,28,898	
H	Provision for GST (18% of J)					9,95,202	
I	Total Estimated Cost with GST					65,24,099	
				Say Rs. In Lakhs		65.24	

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Plates

Plate -1: Location map of the proposed block

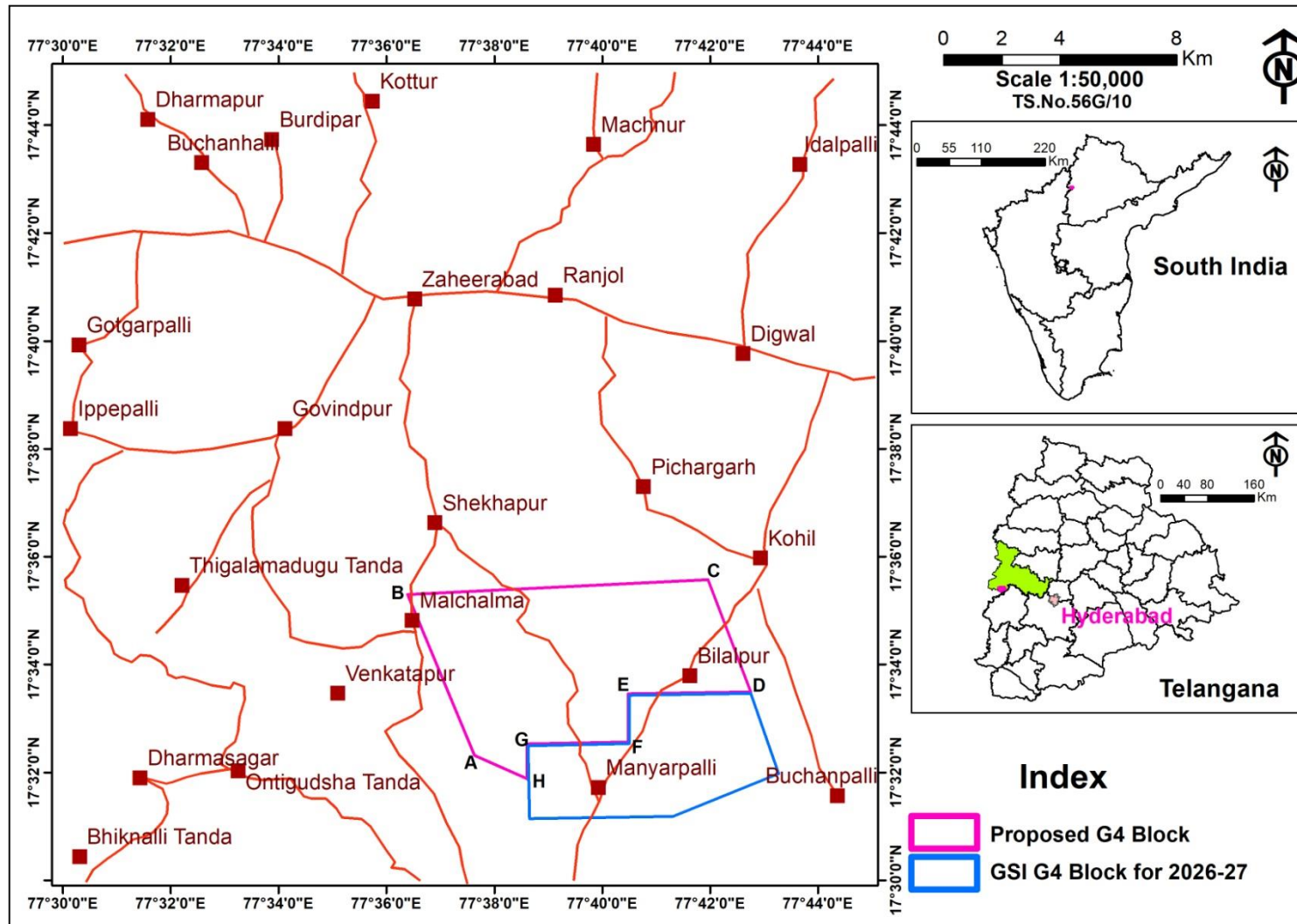


Plate-2: Survey of toposheet No. 56G/10 showing the Bilalpur proposed block

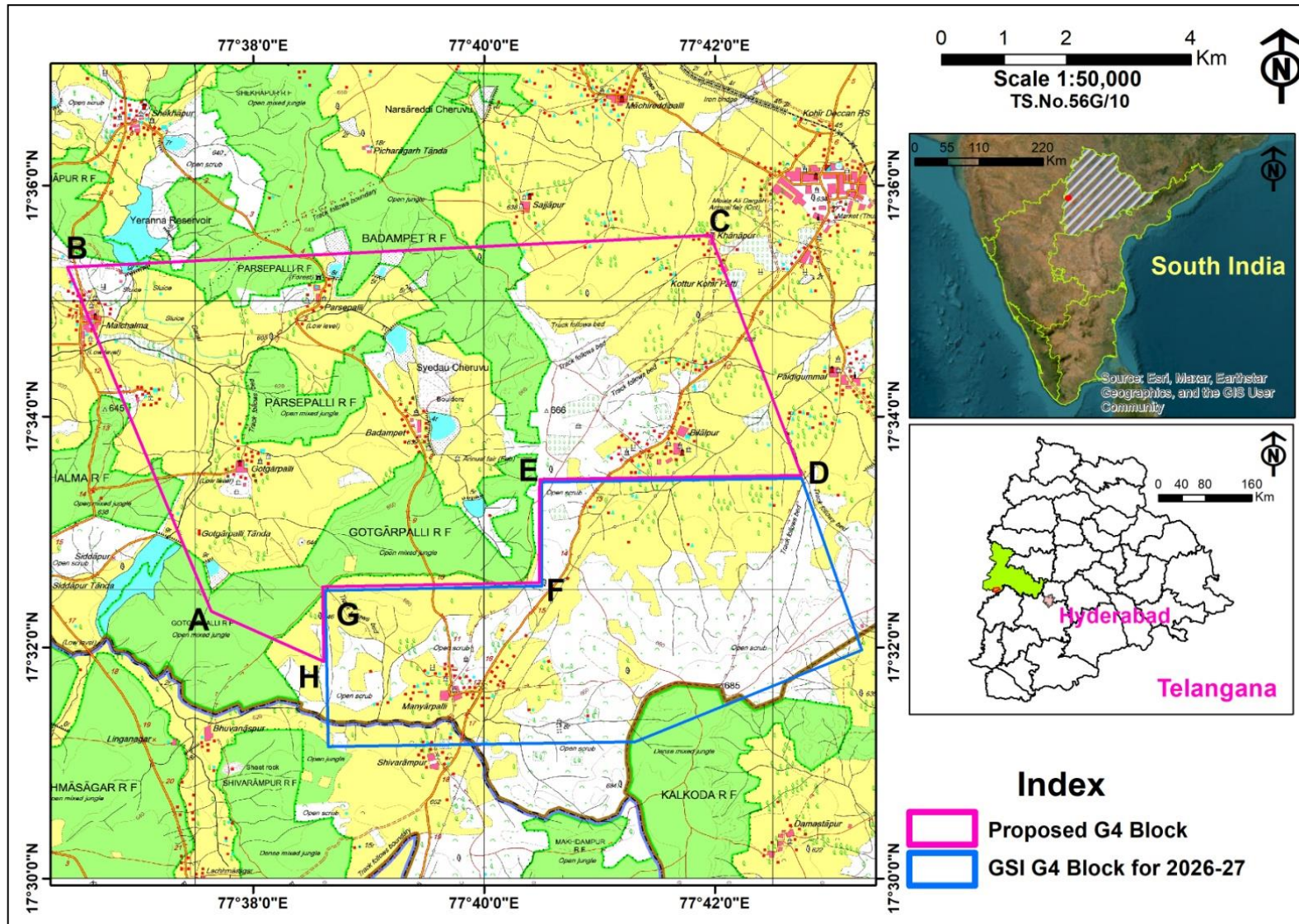


Plate-3: Google earth image map with proposed block (Source. Google earth)

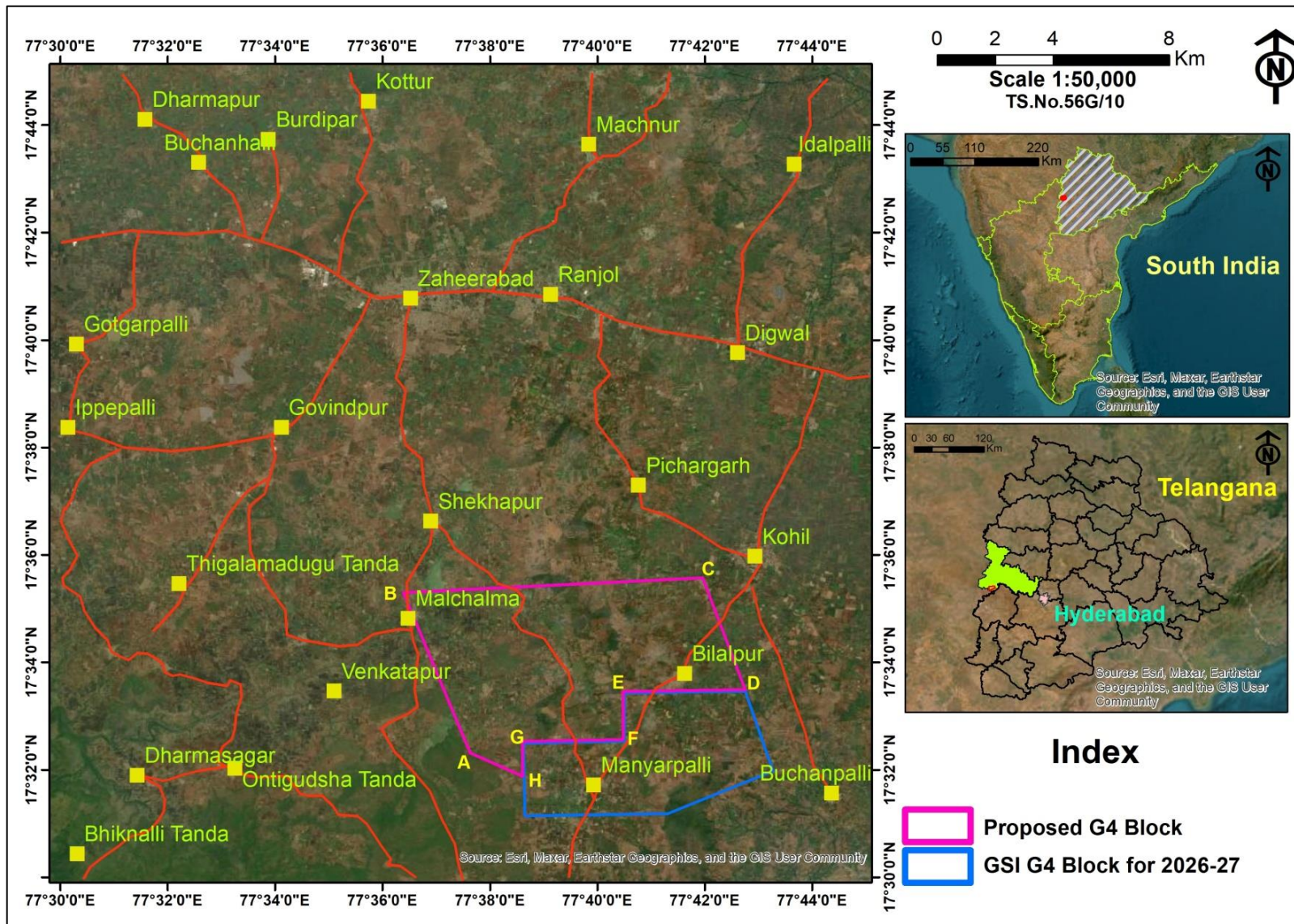


Plate-4: Geological map of toposheet no.56G/10 (1:50,000 scale) (Source. GSI, NGDR)

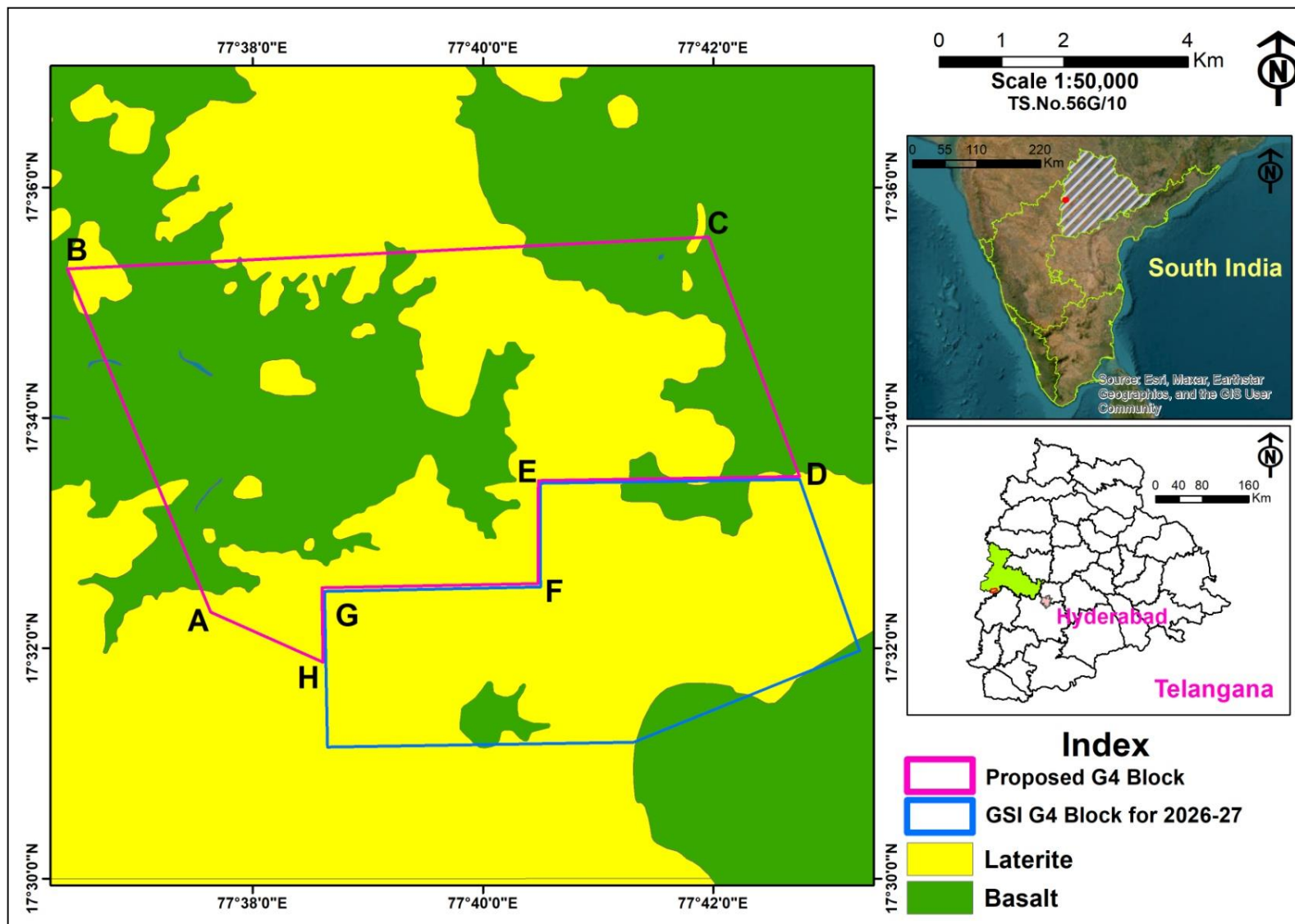


Plate-5: Laterite sample location map of proposed Bilalpur Block

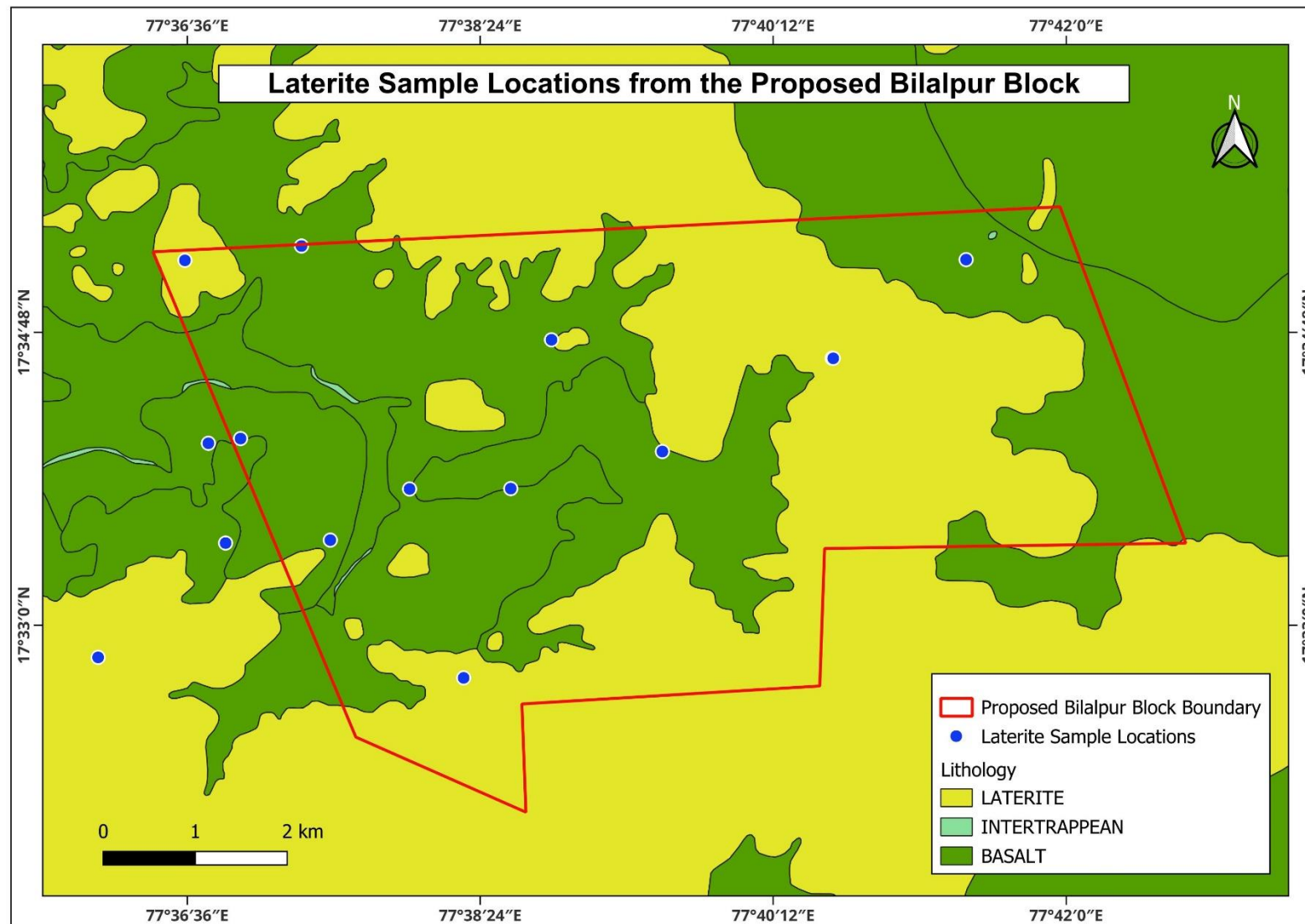


Plate-6: Exploration status of map of GSI and proposed block (Source. GSI, NGDR)

