

**Proposal
for**

**Preliminary exploration (G-3) for REE and associated Rare Metals in the NB 3
block of the northern part of the Siwana Ring Complex, Balotra district,
Rajasthan**

**(Basemetal/ Ferrous/ Non-Ferrous/ Industrial/
Strategic & Critical/ Precious metals etc.)**

Prepared by



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Place: Kolkata, West Bengal

**NMEDT Proposal (For G3 exploration)
REE-RM NB3 Block, Siwana Ring Complex,
Balotra District, Rajasthan**

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1 GENERAL INFORMATION:

Features	Details
Block ID	NB 3 REE and Rare Metal Block
Current Exploration Agency	United Exploration India Pvt. Ltd. (UEIPL)
Previous Exploration Agency	GSI
Commodity	REE and Rare Metals
Mineral Belt	Siwana Ring Complex
Completion period with entire time schedule to complete the project	14 months
Objectives	<p>The present exploration program (G3) has been formulated on the basis of the outcomes of previous work to fulfill the following objectives:</p> <ul style="list-style-type: none">i. Geological mapping on 1:2000 scale to record the lithological and structural features present within the proposed block.ii. Topographical contouring on 1:2000 scale to generate the topography of the area.iii. Exploratory drilling will be carried out at 400m x 200m grid intervals for 25 vertical boreholes to prove the occurrences of REE and associated rare metals up to 125 m depth.iv. To establish resources for REE-RM (333) as per the UNFC norms & Minerals (Evidence of Mineral Contents) Rules- 2015.
Whether the work will be carried out by the proposed agency or through outsourcing and details thereof	UEIPL and its associates

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Balotra District, Rajasthan

	Features	Details																					
1	Components to be outsourced and name of the outsourced agency																						
	Name / number of the geoscientists	4 geoscientists will involve (2 Field Geologist, 1 Headquarter Geologist, 1 GIS specialists)																					
	Expected field days (Geology, Geological party days)	360 days																					
1	Location																						
	The coordinates of the corner points of the proposed NB 3 Block are as follows:																						
	<p>Block Boundary Co-ordinates of NB 3 Block, District - Balotra, Rajasthan, Area 2.0 sq. km, (Toposheet No. 45C 05 & 45C 06)</p> <table border="1"> <thead> <tr> <th>Points</th><th>Latitude</th><th>Longitude</th></tr> </thead> <tbody> <tr> <td>A</td><td>25.756422°</td><td>72.369967°</td></tr> <tr> <td>B</td><td>25.759690°</td><td>72.387131°</td></tr> <tr> <td>C</td><td>25.755153°</td><td>72.389052°</td></tr> <tr> <td>D</td><td>25.753765°</td><td>72.381936°</td></tr> <tr> <td>E</td><td>25.745402°</td><td>72.383919°</td></tr> <tr> <td>F</td><td>25.743228°</td><td>72.373434°</td></tr> </tbody> </table>		Points	Latitude	Longitude	A	25.756422°	72.369967°	B	25.759690°	72.387131°	C	25.755153°	72.389052°	D	25.753765°	72.381936°	E	25.745402°	72.383919°	F	25.743228°	72.373434°
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F	25.743228°	72.373434°																					
	Village	There is no village within the project area. Kitnod, Kumpawas and Khera Khindawara villages are present within 5km radius of the proposed block.																					
	Tehsil/Taluk	Siwana																					
	Districts	Balotra																					
	State	Rajasthan																					
2	Area (hectares/square Kilometers)																						
	Block Area	2.0 Sq. Km.																					
	Forest Area																						
	Govt Land Area	Data Not Available																					
	Private Land Area	Data Not Available																					
3	Accessibility (Arial Distance)																						
	Nearest Rail Head	Mokalsar (11 km)																					

	Features	Details
	Road	NH-325 passes south of the proposed block boundary.
	Airport	Jodhpur Airport.
4	Hydrography	
	Local/Surface Drainage Pattern	The drainage pattern is dendritic and Ephemeral in nature
	Rivers/Streams	The main river is the Ver Nadi, which originates from Chhappan-ka-Pahar. Smaller nals and streams form where three or more rivulets meet, but they disappear a few kilometers away in the sandy terrain. All these rivulets and rivers are ephemeral in nature.
5	Climate	
	Mean Annual Rainfall	The area has arid to semi-arid climate with an average annual rainfall of 250 mm to 300 mm.
	Temperature (December)(Minimum) Temperatures (June)(Maximum)	In winter, the temperature ranges from a minimum of 2°C to 24°C and in summer, from 46°C to 51°C.
6	Topography	
	Toposheet Number	45 C 05 and 45 C 06.
	Morphology of the area	The area has rugged terrain with scattered outcrops. Elevation ranges from 150 masl to 220 masl.
7	Availability of baseline geoscience data	
	Geological Map (1.50k/25k)	1:50000
	Geochemical Map	Data Not Available
	Geophysical Map (Aero-physical, Ground geophysical, regional as well as local scale GP maps)	NGPM Data is available in NGDR
8	Justification for taking up Reconnaissance Survey/ Regional exploration	Work carried out by Lal and Ghosh during 2021-22 of GSI shows that the studied area possesses good potential for REE and RM mineralization. The study highlighted

Features	Details
	<p>following analysis results:</p> <ul style="list-style-type: none">• Rhyolite samples show high ΣREE+Y (91.76–9,764.68 ppm, avg. 1,844.84 ppm) with LREE dominance (ΣHREE/ΣLREE = 0.15).• BRS and channel samples (144.77–7,678.75 ppm and 261.73–6,224.81 ppm) confirm consistent REE enrichment. <p>Remote Sensing and Aerial Survey by RSAS Division, GSI, Bangalore shows that:</p> <ul style="list-style-type: none">• The regional continuity of magnetically susceptible lithounits of Siwana Ring Complex even under soil-covered terrain as predicted from Aeromagnetic maps.• Spectrometric maps of potassium and thorium indicate strong REE mineralization potential in the studied area. <p>Therefore, the previous studies by GSI show that the area is favorable for REE and RM mineralization. However, it is requiring further stage of exploration to establish the deposits as mineable prospect.</p>

2 DETAILED DESCRIPTION OF THE PROPOSAL:

2.1 Block Summary:

2.1.1 PHYSIOGRAPHY:

The physiography of Siwana Ring Complex shows rugged topography with scattered granite outcrops arranged in a semicircular pattern. Elevation ranges from 375 m asl (highest) to 149 m asl (lowest). Arcuate ridges also form a semicircular pattern. The highest peak is 498 m asl at Bhimgoda ka Pahar, and the lowest point is 125 m asl.

2.1.2 DRAINAGE:

The main river of the area is the Ver Nadi, originating from Chhappan-ka-Pahar. Smaller nadas and streams develop where three or more rivulets converge, but they dissipate within a few kilometers in the surrounding sandy terrain. The rivulets and rivers form a network and are ephemeral in nature.

2.1.3 BACKGROUND GEOLOGY (REGIONAL GEOLOGY & GEOLOGY OF THE BLOCK):

2.1.3.1 Regional Geology

The magmatic evolution of Siwana Ring Complex, part of Neoproterozoic Malani Igneous Suite (MIS); ca. 771 ± 2 Ma (Torsvik *et al.* 2001), 745 Ma (Dhar *et al.*, 1996; Rathore *et al.*, 1999) can be divided into three phases (Kumar and Sharma, 2020). First phase is represented by bimodal volcanism of acid and basic flows (acid flows > basic flows). It is intruded by second, plutonic phase comprising arfvedsonite-reibeckite-aegirine bearing per-alkaline Siwana Granite. The third phase being later intrusive phase includes rhyolite, microgranite, andesite and felsite dykes. All these three phases host anomalous Σ REE+Y concentration and the third phase is more enriched (Kumar and Sharma, 2020). Peralkaline igneous rocks, carbonatites, feldspathoid bearing rocks are the main source of REE minerals (\pm HFSE, U & Th etc.) and therefore are suitable host for targeting REE/RM mineralization. Peralkaline granites, volcanics and associated zoned pegmatoids are considered to be storehouse of REE and rare metals (Nb-Ta, Zr-Hf, Sn, W, Be) (Pollard, 1995) and in layered intrusions, the mineralization mostly appears in the more evolved parts of the complexes (Dostal, 2017).

In the Western Indian Craton of Rajasthan, basement rocks and overlying supracrustal belts of Aravalli and Delhi Supergroups have witnessed magmatic events of volcanics and granitoids of Palaeo- to Neo-Proterozoic ages. Granitoids of different

ages (~ 1.8 Ga, ~1.7 Ga, ~1.4 Ga, ~ 1.1 Ga and 850-750 Ma) have intruded these belts. MIS magmatism occurred during Neoproterozoic age and comprises peralkaline (Siwana), metaluminous to mildly peralkaline (Jalore) and peraluminous (Tusham and Jhunjhunu) granites with cogenetic carapace of acid volcanics (welded tuff, trachyte explosion braccia and perlite) and is characterised by volcano-plutonic ring structure and radial dykes (Singh and Vallinagayam, 2009). Three phases in Siwana magmatic activity is widely observed: i) the basal peralkaline (lower 24 flows), ii) middle meta-aluminous (top 21 flows), and iii) reappearance of peralkaline phase as intrusives (Siwana granite) at the end (Chittora and Bhushan, 1994).

TABLE 1: Lithostratigraphy of Trans-Aravalli region (after Bhushan, 2000)

Group/ Supergroup	Age	Rock Types
Marwar Supergroup (Jodhpur Group)	Vendian to Lower Cambrian	Maroon and golden sandstone, siltstone and shale
	Unconformity.....
Pokharan Boulder Bed	Vendian	Scattered boulders and pebbles of glacial origin
	Unconformity.....
Malani Igneous Suite	Neo-Proterozoic	Bimodal volcanics, granites and dyke swarm
	Unconformity.....
Delhi Supergroup (Basement)	Meso- to Neo-Proterozoic	Abu and Erinpura Granite; Metasediments of Sirohi and Pali area. Unspecified gneisses of Balewa-Harsani Area (Archaean Supracrustals?)

2.1.3.2 Local Geology

The proposed block lies within the Siwana Caldera, which represents geologically significant zone of polyphase magmatic activity associated with the Malani Igneous Suite. This region showcases a classic example of bimodal volcanism, comprising both mafic and felsic volcanic flows along with diverse pyroclastic deposits, including various types of tuffs. The magmatic evolution can be categorized into three distinct phases:

- The **first phase** is characterized by extrusive volcanic activity, with flows ranging in composition from basic (basaltic) to acidic (rhyolitic), reflecting the bimodal nature of volcanism.
- The **second phase** involves the emplacement of peralkaline Siwana Granite, enriched with rare minerals and characterized by the presence of riebeckite and aegirine, indicative of an evolved, silica-rich peralkaline melt.
- The **third phase** is marked by the intrusion of younger dykes into both the volcanic and granitic units. These include rhyolite, microgranite, dolerite, and felsite dykes, which further contribute to the petrological and mineralogical complexity of the area.

Lithologically, the block comprises aeolian sand, tuffaceous beds, Siwana Granite, rhyolite flows, and several microgranite, felsite, and dolerite dykes, reflecting repeated magmatic pulses. The area is also intruded by several felsic to rhyolitic dykes, typically trending NE–SW to NW–SE.

Structurally, the block forms part of the northwestern periphery of the Siwana Ring Complex, where volcanic flows dip moderately toward the centre of the Siwana Ring Complex, likely due to subsidence along ring dyke fractures. The overall lithological assemblage and structural continuity indicate a volcanic stratigraphy favourable for REE enrichment, particularly within specific evolved rhyolitic flows.

General sequence of the rocks is as follows:

Table 2: Local Stratigraphic succession within the proposed block

Group / Supergroup	Rock Types	Igneous Activity
Quaternary	Aeolian sand and silt	---
Malani Igneous Suite (Neo Proterozoic 750Ma)	Tuff, Micro granites, felsites and dolerite dykes	Volcanic phase
	Siwana Granite	
	Rhyolites and basic volcanic dykes	

2.1.4 MINERAL POTENTIALITY BASED ON GEOLOGY, GEOPHYSICS, GROUND GEOCHEMISTRY):

Reconnaissance survey for REE and associated rare metals at the northern periphery of the Siwana Ring Complex, of Balotra District, Rajasthan (G-4) was carried out by Lal and Ghosh during 2021-22 of GSI.

This block has been identified based on their analytical results of the Geochemical data, Remote Sensing and Aerial Survey.

Aeromagnetic maps clearly delineate the regional continuity of magnetically susceptible lithounits of the Siwana Ring Complex, even in soil-covered terrain. Spectrometric potassium and thorium maps further suggest favorable conditions for REE mineralization in the exposed zones.

Lal and Ghosh (2021) conducted large-scale geological mapping (1:12,500) along the northern periphery of the Siwana Ring Complex, covering the stretch from Sainji ki Beri to Meli. Their work identified **32 rhyolitic flows** along with several **felsic/rhyolitic dykes**. Flows 14 and 15 represent the most REE-enriched rhyolitic units in the area.

- Flow 15 shows Σ REE+Y values between 2,213.43 ppm and 8,027.71 ppm (maximum LREE - 5,079.52 ppm; HREE - 992.05 ppm).
- Flow 14 shows Σ REE+Y values between 6,944.16 ppm and 7,528.11 ppm (maximum LREE - 4,848.19 ppm; HREE - 941.11 ppm).

The following table shows the Geochemical data from the studied area, conducted by Lal and Ghosh in 2021-22 Field session of GSI.

Table 3: Results of Geochemical analysis (Lal and Ghosh, 2021-2022, GSI)

SL. No	Samples	ΣREE+Y Range (ppm)	Average (ppm)
1.	Rhyolite Samples	91.76 - 9764	1844.84
2.	BRS Sample (Felsic/ Rhyolitic dyke)	144.77 - 7678.75	1400.14
3.	Channel Sample	261.73 - 6224.81	-

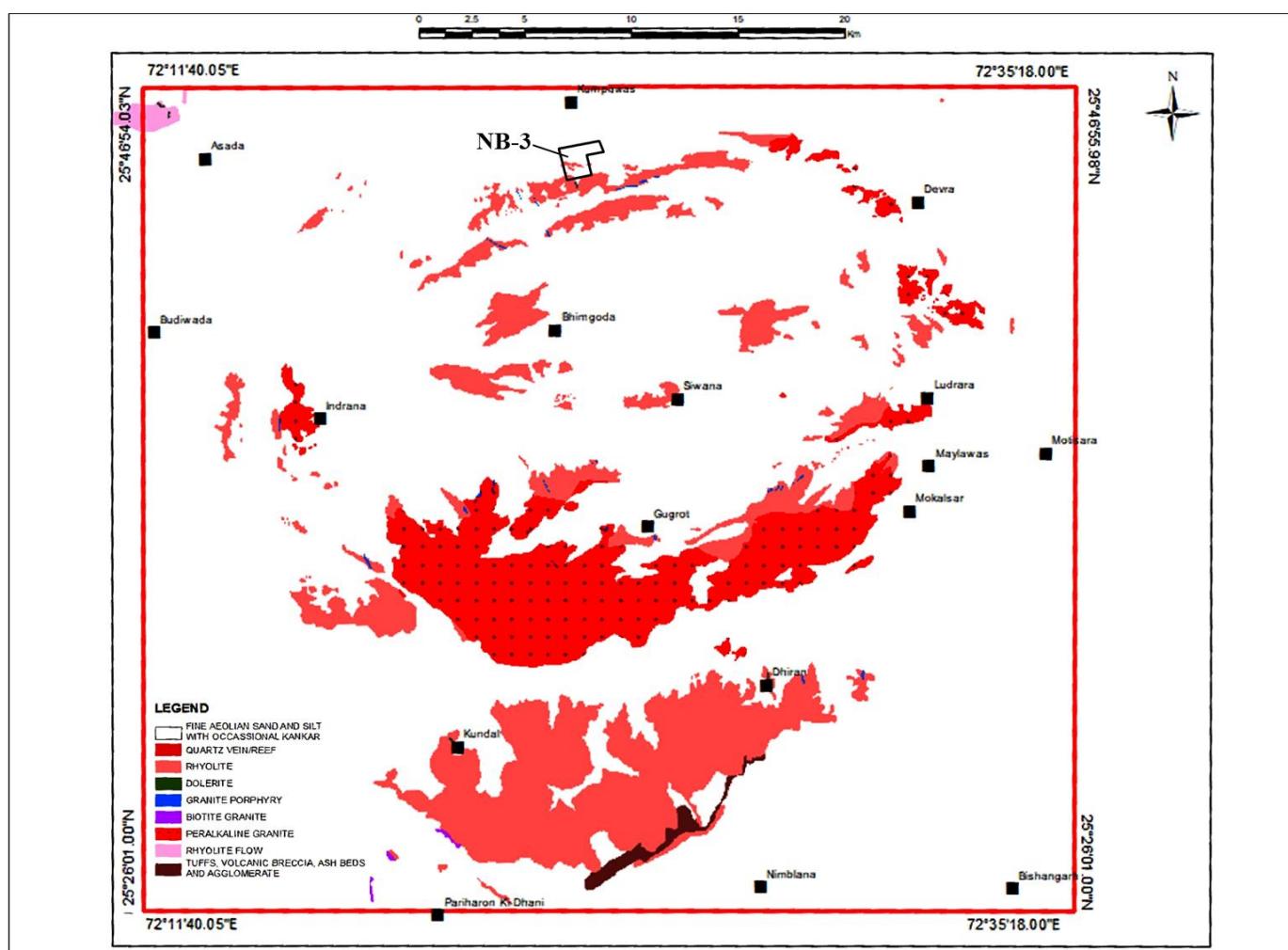


Figure 1: Geological map in and around proposed block

2.1.5 SCOPE FOR THE EXPLORATION:

- Geological mapping on a 1:2000 scale.
- Topographical survey on 1:2000 scale.
- Exploratory drilling of 25 vertical boreholes of 125m depth at 400m x 200m grid interval.
- Geochemical sampling and Analysis.
- Petrographic study
- Geological report preparation

2.1.6 OBSERVATION AND RECOMMENDATIONS OF G4 REPORT

The G4 stage of exploration in the studied area has been carried out by Lal and Ghosh during 2021-22 of GSI, shows that the studied area possesses good potential for rare earth element (REE) mineralization. They identified 32 rhyolitic flows along with several felsic dykes. Many of these flows exhibit significant enrichment in total REE (tREE).

Chemical analysis of rhyolite samples from the study area shows Σ REE+Y values ranging from 91.76 ppm to 9,764.68 ppm, with an average of 1,844.84 ppm, and a Σ HREE/ Σ LREE ratio of 0.15.

Additionally, 22 BRS samples from felsic/rhyolitic dykes yielded Σ REE+Y values between 144.77 ppm and 7,678.75 ppm, with an average of 1,400.14 ppm.

Channel samples show Σ REE+Y values ranging from 261.73 ppm to 6,224.81 ppm and a Σ HREE/ Σ LREE ratio of 0.19.

Flows 14 and 15 represent the most REE-enriched rhyolitic units in the area. In the studied block, Flow 15 shows Σ REE+Y values between 2,213.43 ppm and 8,027.71 ppm, with maximum LREE and HREE concentrations of 5,079.52 ppm and 992.05 ppm, respectively. Flow 14 exhibits Σ REE+Y values between 6,944.16 ppm and 7,528.11 ppm, with maximum LREE and HREE concentrations of 4,848.19 ppm and 941.11 ppm, respectively.

Remote Sensing and Aerial Survey by RSAS Division, GSI, Bangalore, during FS. 2017-18 established the regional continuity of magnetically susceptible lithounits of the Siwana Ring Complex, even in soil-covered terrain with the help of Aeromagnetic survey. Spectrometric potassium and thorium maps further suggest favorable conditions for REE mineralization in the exposed zones.

Based on the chemical data and the Remote Sensing and Aerial Survey, NB 3 block is recommended for G3 stage exploration.

2.2 Previous work:

Preliminary sampling of the rhyolites and associated tuffs of Siwana Ring Complex, Balotra district, carried out by GSI during 2013-14, indicated anomalous REE values with Σ REE ranging from 1334 to 3319 ppm Σ REE (Rastogi & Mukherjee, 2015).

Bidwai *et al.*, 2014, reported the presence of high LREE, Zr, Nb, Th and U along with Ag in surface samples in the Siwana Ring Complex. Das *et al.*, 2015, carried G4

investigation in Siwana eastern and central block. Kumar and Sharma, 2020, carried out G-4 investigation and reported Σ REE+Y ranges in various lithiounits are

- i) Plagioclase rich granite (n=79) Σ REE+Y = 0.029%-0.70%.
- ii) K-feldspar rich granite (n=116) Σ REE+Y = 0.047%-0.66%.
- iii) Younger Intrusives (n=146) Σ REE+Y = 0.019%-2.66%.
- iv) Felsic volcanic (n=43) Σ REE+Y = 0.015%-0.96% and
- v) Enclave/Restite (n=19) Σ REE+Y = 0.022%-1.27%.

LREE/HREE ratio indicates that LREE>>HREE in the area and LREE values range between 86.45ppm to 1.93%, however, HREE values range between 23.94ppm to 0.26%. LREE:HREE ratio in Siwana area is 4:1 approximately. Apart from REE, rare metals and some trace elements also indicate very encouraging results, Zr (0.1% to 1.1%), Nb (2.5ppm to 1039ppm), Ba (25ppm to 3948ppm), Zn (120ppm to 1258ppm), U (0.61ppm to 124ppm), Th (2ppm to 481ppm) and Hf (4.52ppm to 828.18ppm).

Barman and Neog, 2018 mapped the peralkaline – peraluminous granite (A type) and in the Siwana area extending from Mokalsar in the east to Siner in the west through Mawri, Gugrot, Piplun, Goliyan Bhairan and Kalur Ka Danta area. REE bearing carbonates (perisite) and phosphates (monazite) were identified in both plutonic and volcanic rock types. In addition to REE bearing mineral phases, haematite, ilmenite and zircon are also identified from both plutonic and volcanic phases. The granite recorded values ranging from 182.77 ppm to 8611.11 ppm and the average being 2006.95 ppm (count=84). The volcanic recorded values ranging from 142.3 ppm to 8502.50 ppm, average value being 2008.03 ppm (count=116). Sukleswar Ka Mandir (G3) block yields tREE upto 2901ppm in microgranite dyke, 2121 ppm in alkali feldspar granite and 2996ppm in andesite.

Lal and Ghosh, 2021 carried out large scale geological mapping (1:12500 scale) at the northern periphery of the Siwana Ring Complex, stretching from Sainji ki Beri to Meli area. They marked 32 nos. of rhyolitic flows along with several felsic dykes in the area. Several flows are found to be highly enriched in tREE concentration. Chemical analysis data from rhyolite samples of study area yielded Σ REE+Y values ranging from 91.76ppm to 9764.68ppm, with average value of 1844.84ppm. Σ HREE/ Σ LREE ratio of the same is 0.15. 22 BRS samples from felsic/rhyolite dykes yielded Σ REE+Y values ranging from 144.77ppm to 7678.75ppm, with average value of 1400.14ppm. Σ REE+Y value in channel samples ranging from 261.73 to

6224.81ppm, with Σ HREE/ Σ LREE ratio of 0.19. Flow no. 14 and 15 are highly enriched REE flow of rhyolite in the area. In the studied block Σ REE+Y in flow no. 15 ranges between 2213.43ppm to 8027.71ppm with maximum value of LREE 5079.52ppm and maximum value of HREE 992.05ppm. In flow no. 14, Σ REE+Y ranges between 6944.16ppm to 7528.11ppm with maximum LREE 4848.19ppm and maximum HREE 941.11ppm.

Remote Sensing and Aerial Survey for toposheet no. 45C/06 and 45C/10 were carried out by RSAS Division, GSI, Bangalore, during FS. 2017-18. Aeromagnetic maps help in delineating the regional continuity of magnetically susceptible lithounits of Siwana Ring Complex even under soil-covered terrain. Spectrometric maps of potassium and thorium further suggest that the studied area possesses good potential for rare earth element (REE) mineralization in exposed area.

2.3 Block Boundary:

The NB-3 block is situated in the northern part of the toposheet no. 45C/06 and the southern part of the toposheet no. 45C/05. The block lies about 12 km NW of Siwana town. Siwana is located 132km east of Barmer and 35 south east of Balotra.

The co-ordinates of the proposed block are as follows:

Table 4: Boundary Co-ordinate of the proposed block

Block Corner Points / Cardinal Points	Latitude	Longitude
A	25.756422°	72.369967°
B	25.759690°	72.387131°
C	25.755153°	72.389052°
D	25.753765°	72.381936°
E	25.745402°	72.383919°
F	25.743228°	72.373434°

2.4 Planned Methodology

Detailed mapping of 2.0 sq km area (on 1:2,000) is to be carried out for the item along with collection of surface samples to delineate REE & RM mineralized zones. The depth continuity, grade and thickness of these zones will be checked by drilling about 24 vertical boreholes of 125m depth on a grid of 400m x 200m.

As most of the REE minerals are not identified by study of thin sections, 05 samples for EPMA and 05 samples for XRD studies are also proposed to identify the REE mineral phases.

Initially 4 to 5 boreholes will be drilled, and respective core samples will be tested for REE and associated RM concentrations. If encouraging results are received the remaining drilling and core sampling will be done simultaneously.

Nature of Work	Total Workload envisaged
1. Geological Survey: Detail Mapping (Scale: 1:2,000)	2.0 km ²
2. Technological Survey: a) Subsurface Exploration: Drilling	3125m (25 BH of 125m depth)
b) Pitting & Trenching	50 m ³
3. Geophysical BH logging	1000m
4. SMPL:	
a) Channel Samples (number)	100
b) Pitting & Trenching Samples (number)	50
c) Core sample (number)	800
d) PCS (Major, Minor, Trace, REEs)	15
e) PS (number)	15
f) XRD (number)	5
h) EPMA (number)	5
6. Chemical Analyses (number) *REEs, Y, Hf, Zr, Nb, Ta	950

2.5 Reference

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NB 3 REE and Rare Metal Block
Balotra District, Rajasthan

2.6 Project Schedule

Sl. No.	Particulars	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Review	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14
1	Camp Setting															
2	Geological Mapping															
3	Topographical Survey															
4	Pitting/ Trenching/ Channel sampling															
5	Sample Preparation															
6	Sample analysis															
7	Drilling (2 rig)															
8	BH Geophysical survey															
9	Sample Preparation															
10	Laboratory Studies															
11	Petrographic study/ XRD/ EPMA															
12	Report Preparation															

2.7 Cost of the Project

Preliminary exploration for REE and associated Rare Metals in the NB 3 block of the northern part of the Siwana Ring Complex, Balotra district, Rajasthan Area: 2.0 sq.km, Timeline- 14 months							
S. No.	Item of Work	Unit	Rates as per NMET SoC 2020-21		Estimated Cost of the Proposal		Remarks
			SoC-Item -Sl No.	Rates as per SoC	Qty.	Amount (Rs)	
A	GEOLOGICAL WORK						
1	Geological Mapping (1:2000)						
i	Charges for Geologist-Field	day	1.2	11,000	90	990000	
ii	Charges for one Geologist - HQ	day	1.2	9,000	45	405000	
iii	Labours Charges; Base rate	day	5.7	541	180	97380	
2	Pitting/Trenching						
	Trenching	cu.m	2.1.1	3330	50	166500	
	Charges for Geologist per day (Field) for Pitting/trenching/ channel work	day	1.2b	11000	30	330000	
	Labours Charges; Base rate	day		541	60	32460	
2	Samples Preparation						
i	Charges for one Sampler per day	one sampler per day	1.5.2	5,100	19	96900	Channel-100, Trenching-50
ii	Labours (4 Nos)	day		541	76	41116	
3	Survey						
i	Topographical Survey	day	1.6.1a	8300	90	747000	Topographical Survey on 1:2000 (2 m contour interval)
ii	Labours (4 Nos)	day	5.7	541	360	194760	
iii	Bore Hole Fixation and determination of coordinates & Reduced Level of the boreholes by DGPS and boundary coordinates	Per Point of observation	1.6.2	19,200	31	595200	25 BHs and 6 boundary coordinates
Sub Total- A							
B	DRILLING						
i	Drilling upto 300m (Hard Rock) (1 rig)	m	2.2.1.4a	11,500	3,000	34500000	

**NMET Proposal (For G3 exploration)
NB 3 REE and Rare Metal Block
Balotra District, Rajasthan**

**Preliminary exploration for REE and associated Rare Metals in the NB 3 block of the northern part of the Siwana Ring Complex, Balotra district, Rajasthan
Area: 2.0 sq.km, Timeline- 14 months**

S. No.	Item of Work	Unit	Rates as per NMET SoC 2020-21		Estimated Cost of the Proposal		Remarks
			SoC-Item -Sl No.	Rates as per SoC	Qty.	Amount (Rs)	
ii	Land / Crop Compansation	per BH	5.6	20,000	25	500000	
iii	Construction of concrete Pillar (12"x12"x30")	per borehole	2.2.7a	2,000	25	50000	
iv	Transportation of Drill Rig & Truck associated per drill (2 rigs)	Km	2.2.8	36	8,200	295200	2 Rig, Kolkata to Khilapadar Distance 2050km.
v	Monthly Accomodation Charges for drilling Camp (up to 2 Rigs)	month	2.2.9	50,000	4	200000	
vi	Drilling Camp Setting Cost (2 rigs)	Nos	2.2.9a	2,50,000	2	500000	
vii	Drilling Camp Winding up Cost (2 rigs)	Nos	2.2.9b	2,50,000	2	500000	
viii	Approach Road Making (Flat Terrain)	Km	2.2.10a	22,020	15	330300	
ix	Core Preservation: One complete borehole plus mineralised cores of all the remaining Bhs	m	5.30	1,590	800	1272000	
x	Borehole Geophysical survey- 1000 m	m	3.12	10,88,941	0.60	653364.6	
xi	Charges for Geologist per day (Field) for Drilling monitoring	day	1.5.1a	11000	120	1320000	
xii	Labours (4 Nos)	day		541	360	194760	
xii	Sampler	day		5100	100	510000	
xiii	Labours (4 Nos)	day		541	400	216400	
Sub Total- B						4,10,42,024.60	
C	LABORATORY STUDIES						
1	Chemical Analysis						
i	XRF						
	Major Oxides	Nos	4.1.15a	4,200	15	63000	
	(10%) Check samples	Nos	4.1.15a	4,200	2	8400	
ii	ICPMS for Trace elements						
	Primary samples	Nos	4.1.14	7,731	950	7344450	

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Prepared By: United Exploration India Pvt. Ltd. (NPEA)

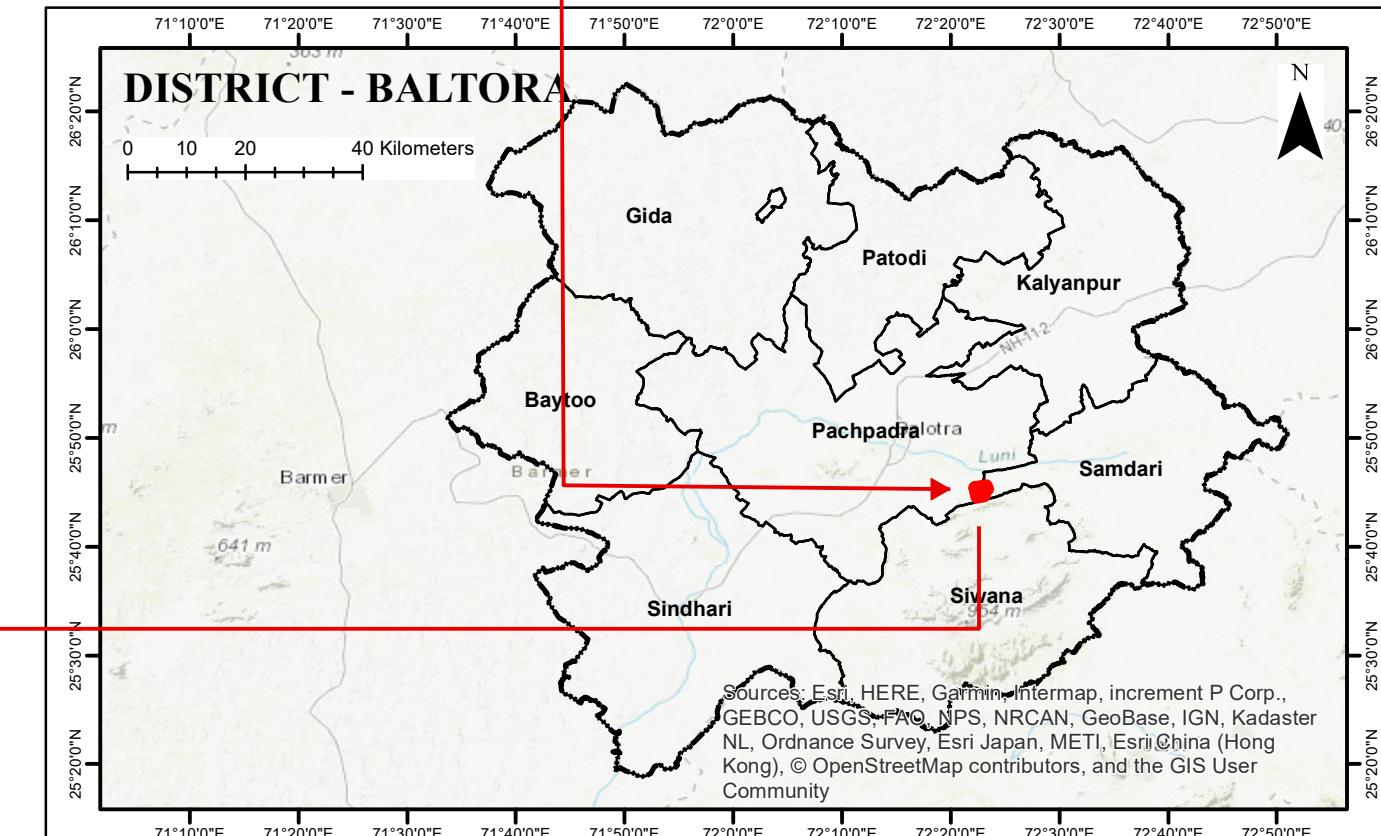
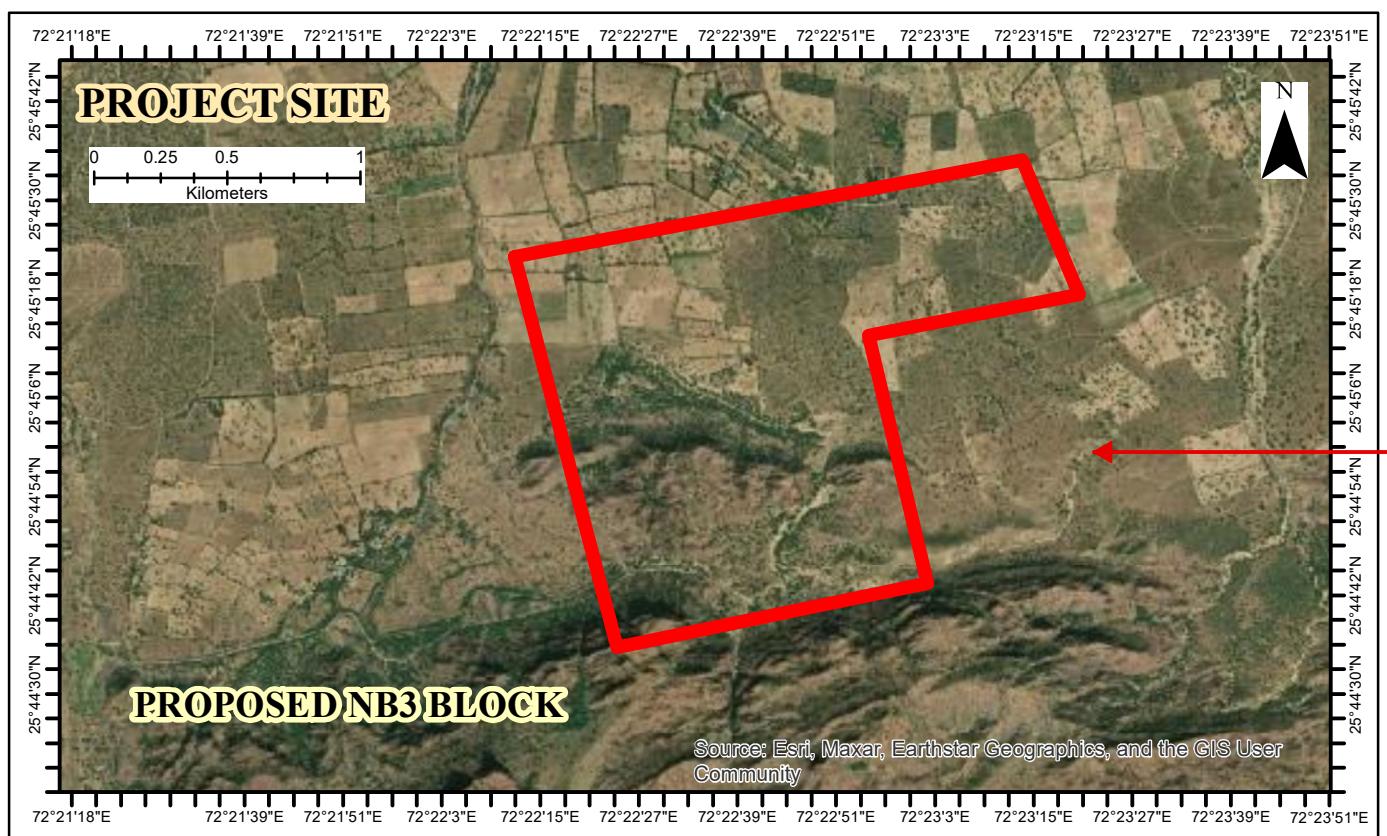
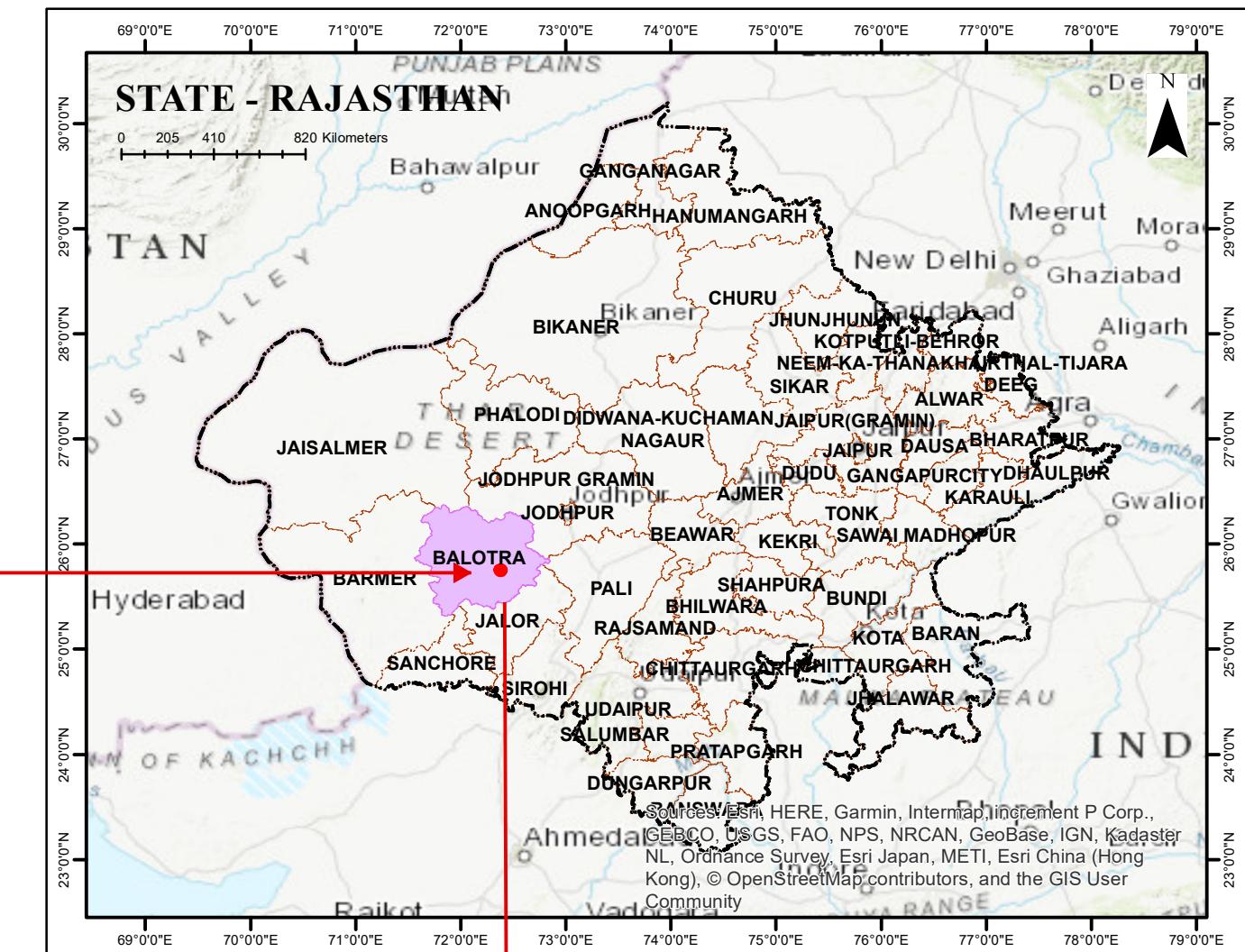
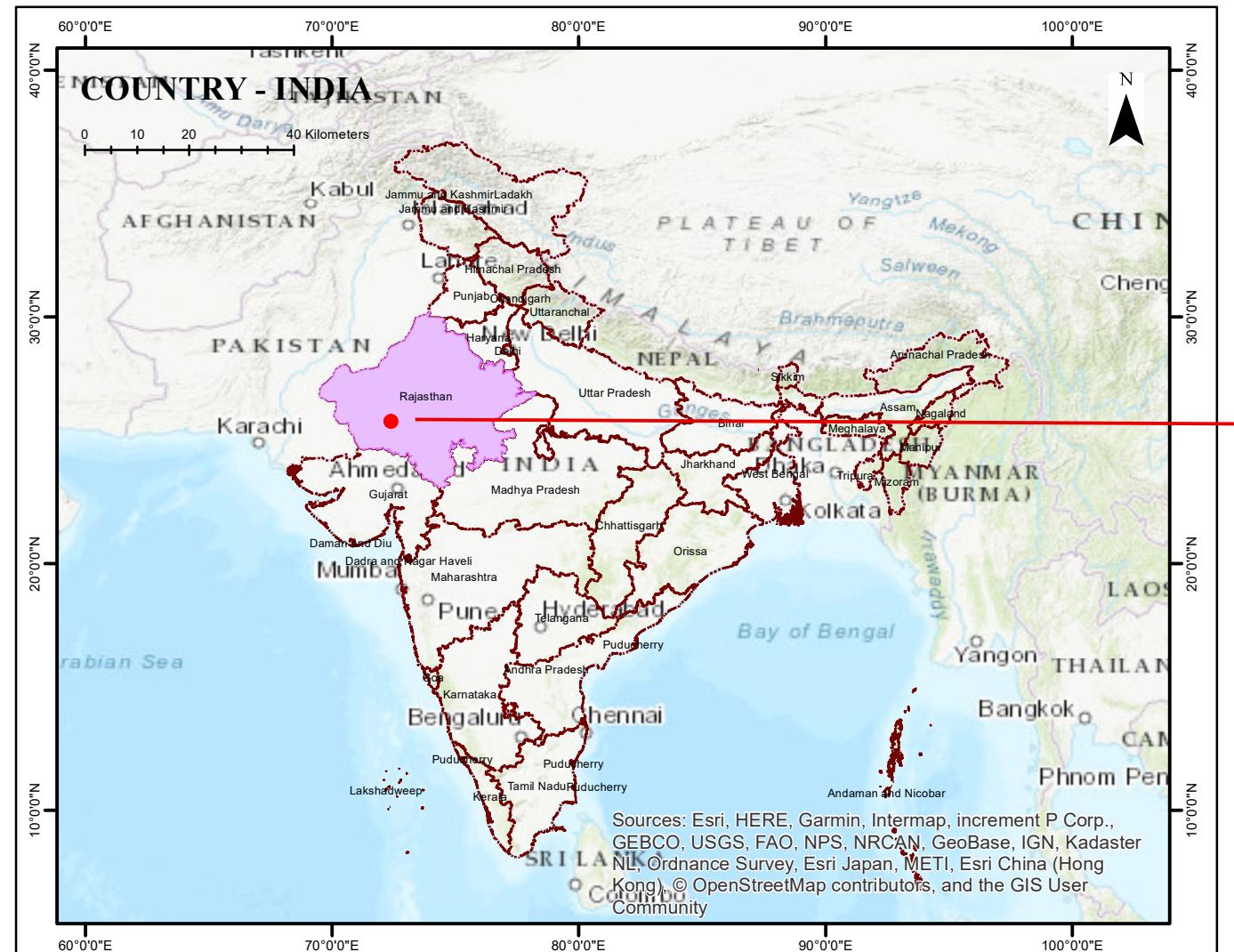


**NMET Proposal (For G3 exploration)
NB 3 REE and Rare Metal Block
Balotra District, Rajasthan**

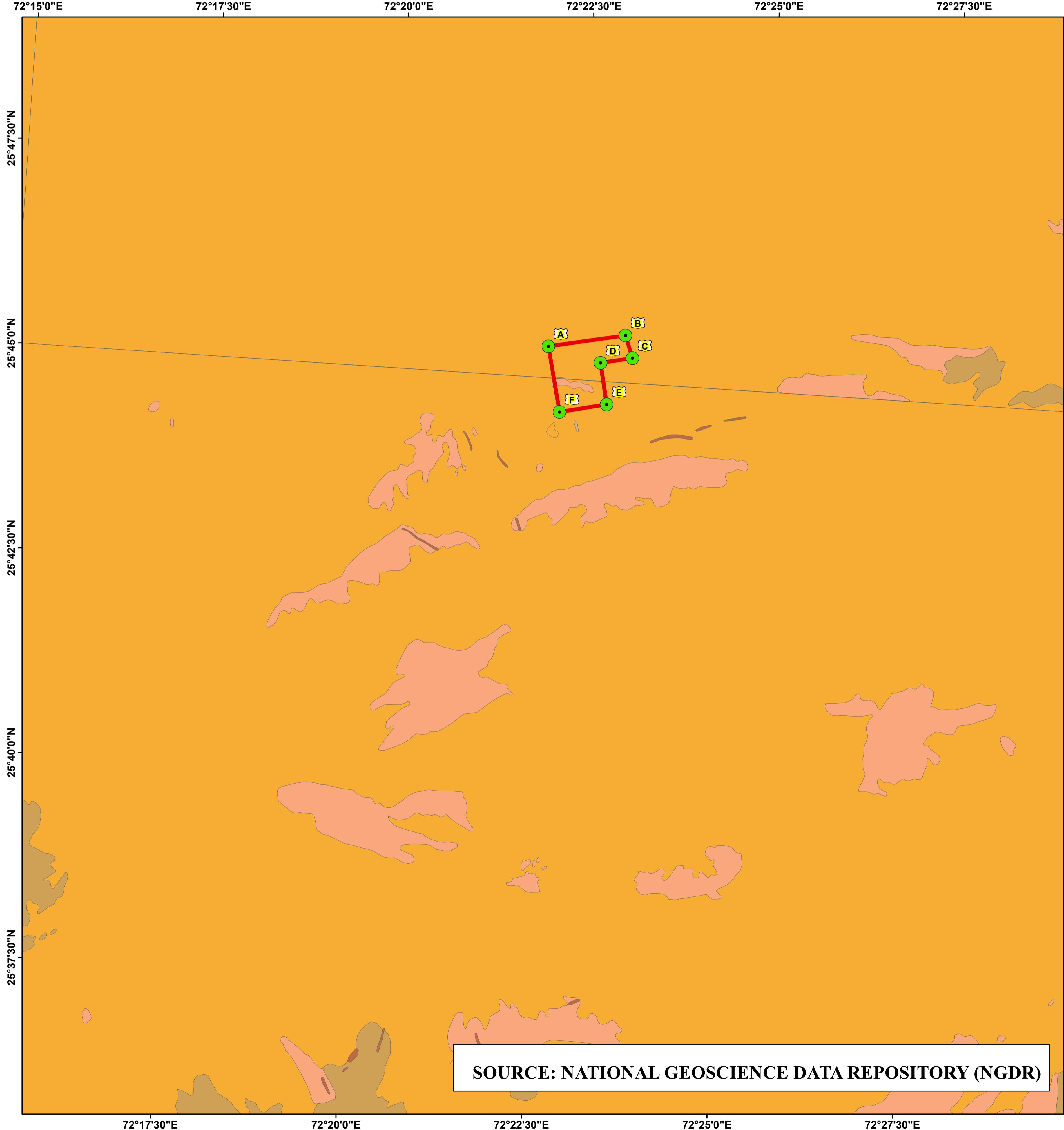
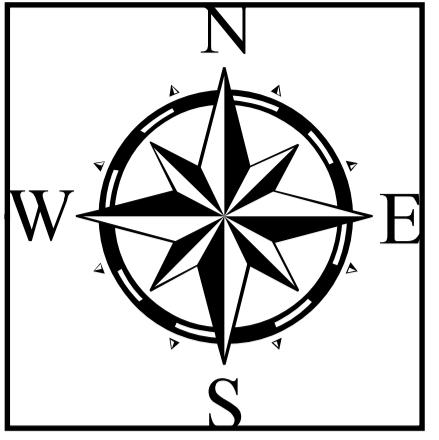
**Preliminary exploration for REE and associated Rare Metals in the NB 3 block of the northern part of the Siwana Ring Complex, Balotra district, Rajasthan
Area: 2.0 sq.km, Timeline- 14 months**

S. No.	Item of Work	Unit	Rates as per NMET SoC 2020-21		Estimated Cost of the Proposal		Remarks
			SoC-Item -Sl No.	Rates as per SoC	Qty.	Amount (Rs)	
	Check samples	Nos	4.1.14	7,731	95	734445	
2	Physical & Petrological Studies						
i	XRD	Nos	4.5.1	4000	5	20000	
ii	EPMA	Hrs	4.4.1	8540	5	42700	
v	Preparation of thin section	Nos	4.3.1	2,353	15	35295	
vi	Complete petrographic study report	Nos	4.3.4	4,232	15	63480	
vii	Digital Photographs	Nos	4.3.7	280	15	4200	
viii	Bulk Density studies	Nos	4.8.1	1,605	5	8025	
Sub Total- C						8323995	
D	Total A to C					4,93,66,019.60	
E	Geological Report Preparation		5.2.iii	exploration with cost of work exceeding ₹ 300 lakh: A minimum of ₹ 9 lakh or 3% of the value of work whichever is more		14,80,980.59	
F	Peer review Charges		As per EC decision			30000	
G	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 Lakhs whichever is lower		5,00,000	
H	Total Estimated Cost without GST					5,08,77,000.19	
I	Provision for GST (18% of H)					91,57,860.03	
J	Total Estimated Cost with GST					6,00,34,860.22	or Say Rs. 600.35 Lakh

LOCATION MAP OF PROPOSED NB3 BLOCK BOUNDARY FOR REE AND ASSOCIATED RARE METALS OF NORTHERN PART OF SIWANA RING COMPLEX, BALTORA DISTRICT, RAJASTHAN



GEOLOGICAL MAP OF PROPOSED NB3 BLOCK BOUNDARY FOR REE AND ASSOCIATED RARE METALS OF NORTHERN PART OF SIWANA RING COMPLEX, BALTORA DISTRICT, RAJASTHAN



LEGEND

- PROPOSED NB3 BLOCK COORDINATE
- PROPOSED NB3 BLOCK BOUNDARY

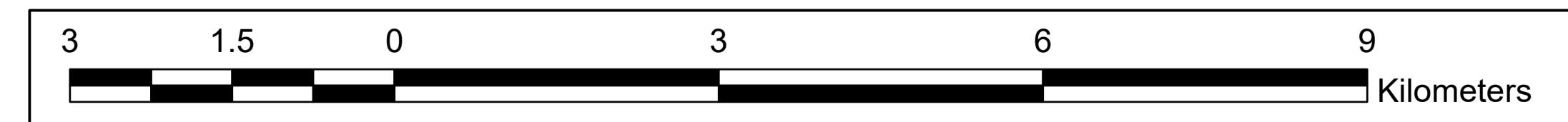
LITHOLOGY

- DOLERITE
- FINE AEOLIAN SAND AND SILT WITH OCCASSIONAL KANKAR
- GRANITE PORPHYRY
- PERALKALINE GRANITE
- QUARTZ VEIN/REEF
- RHYOLITE
- TUFFS, VOLCANIC BRECCIA, ASH BEDS AND AGGLOMERATE

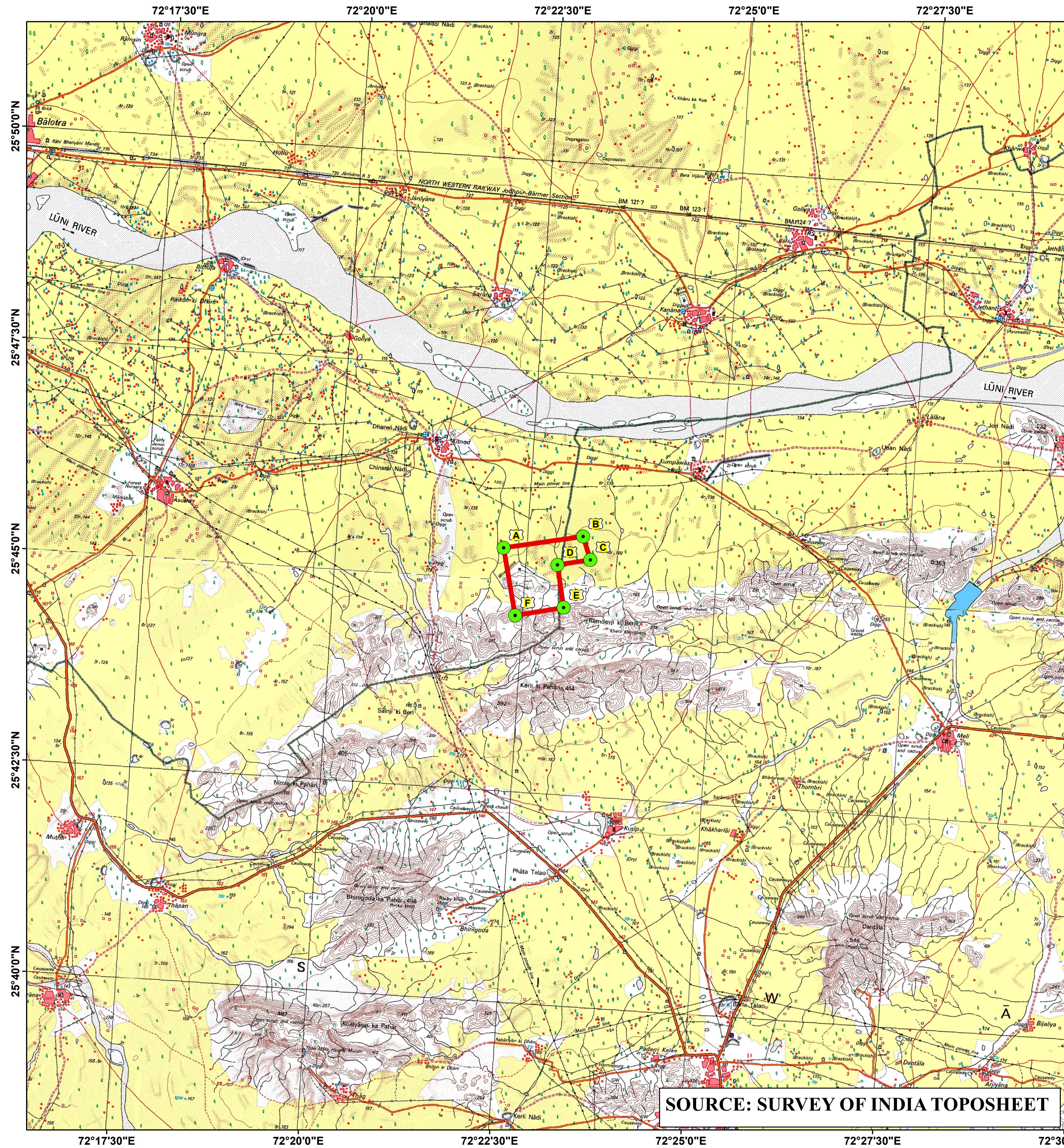
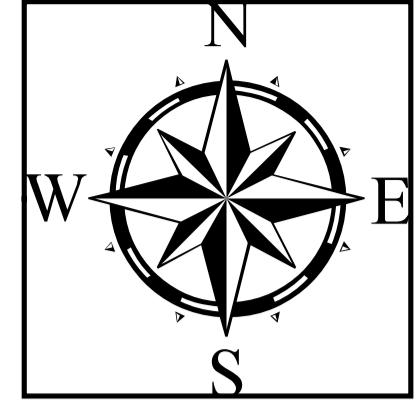
PROPOSED NB3 BLOCK BOUNDARY COORDINATE

POINT ID	AREA (SQKM)	LATITUDE	LONGITUDE
A	2.00	25.756422°	72.369967°
B		25.759690°	72.387131°
C		25.755153°	72.389052°
D		25.753765°	72.381936°
E		25.745402°	72.383919°
F		25.743228°	72.373434°

SCALE - 1:50,000



**PROPOSED NB3 BLOCK BOUNDARY FOR REE AND ASSOCIATED RARE METALS
OF NORTHERN PART OF SIWANA RING COMPLEX, BALTORA DISTRICT, RAJASTHAN
OVERLAY ON TOPOSHEET**



LEGEND

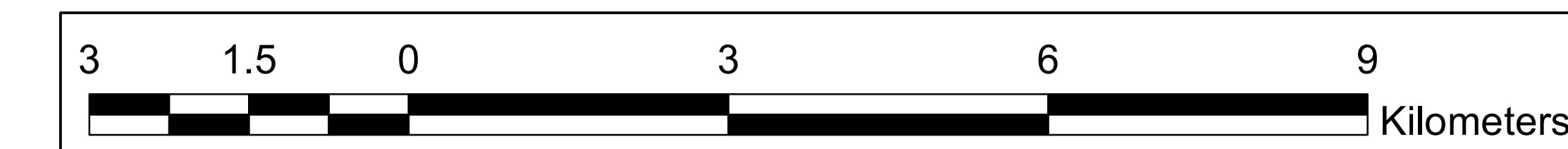
- PROPOSED NB3 BLOCK COORDINATE
- PROPOSED NB3 BLOCK BOUNDARY

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F		25.743228°	72.373434°
	2.00		

TOPOSHEET NO : G43M5 (45C/5) AND G43M6 (45C/6)

SCALE - 1:50,000



PROPOSED BORE HOLE LOCATION PLAN FOR NB3 BLOCK

BLOCK AREA:- 2 SQKM

