Proposal for Reconnaissance Survey (G4 Stage) of REE in RSRC B Block, Balotra District, Rajasthan under NMEDT

Commodity: REE

By

MMPL Private Limited

Place: Kolkata
Date: April-2026

1 Summary of the Block G4 Stage Exploration

	Features	Details
	Block ID	RSRC B block
	Current Exploration Agency	MMPL Private Limited
	Previous Exploration Agency	Geological Survey of India
	G4 stage Geological Report (Previous stage Geological Report)	Investigation For REE and Other Rare Metals in Siwana Area, Barmer District, Rajasthan (Final report for field season 2014-15) by Utpol Kumar Das, Geologist, Arindam Gantait, Geologist, Lopamudra Panda, Geologist Final Report on Reconnaissance Survey for Rare Earth Elements and Associated Mineralization around Indrana Siwana Area, Central Part of Siwana Ring Complex, Siwana (SRC), Barmer District, Rajasthan (G-4 Stage) (field season 2021-22) by Vivek V. Kumar, Sr. Geologist and Dr. Kiran Jyoti Mishra, Sr. Geologist
	Commodity	REE and associated minerals
	Mineral Belt	Siwana Ring Complex (SRC)
	Completion Period with entire time schedule to complete the project	12 months
	Objectives	Objectives of the Reconnaissance survey (G4) in RSRC B block over an area of 130 sq km as follows: 1. Large Scale Geological mapping on 1:12,500 scale to demarcate the REE bearing zone and associated minerals. 2. Keeping in view of the lithotype present and based on the outcome of the geological mapping and surface sampling, close spaced ground geophysics, vertical boreholes phase wise will be planned: beginning with 1 borehole in 8 sq. km, followed by 1 borehole in 4 sq. km, and subsequently 1 borehole in 2 sq. km, based on results obtained. 3. Chemical Analysis of core samples and surface samples. 4. Determination of dimension and estimation of Resource, Grade and mineral content in G4 level as per Minerals (Evidence of Mineral Contents) Rule 2015.
	Whether the work will be carried out by the proposed agency or through out-sourcing and details thereof. Components to be outsourced and name of the out-sourced agency	The work will be carried out by proposed agency
	Name/Number of Geoscientists	In field: Two Geologists. At Headquarters: Two Geologists
	Expected Field days (Geology) Geological Party Days	Item execution duration 12 Months and actual field days of field geologist 180 days for two Geologist and 60 days for HQ.

1.	**Location**	**Point_id**	**Lattitude**	**Longitude**		
		1	25.7676°	72.5030°		
		2	25.7558°	72.5133°		

		3	25.7134°	72.5131°		
		4	25.7134°	72.5331°		
		5	25.7044°	72.5331°		
		6	25.7044°	72.5131°		
		7	25.6683°	72.5130°		
		8	25.6683°	72.5330°		
		9	25.6773°	72.5330°		
		10	25.6773°	72.5529°		
		11	25.6232°	72.5527°		
		12	25.6231°	72.5129°		
		13	25.6322°	72.5129°		
		14	25.6322°	72.5328°		
		15	25.6593°	72.5329°		
		16	25.6593°	72.4732°		
		17	25.6954°	72.4733°		
		18	25.6954°	72.4334°		
		19	25.6683°	72.4333°		
		20	25.6683°	72.4135°		
		21	25.6503°	72.4134°		
		22	25.6502°	72.3736°		
		23	25.6683°	72.3736°		
		24	25.6683°	72.3538°		
		25	25.6773°	72.3538°		
		26	25.6773°	72.3736°		
		27	25.6953°	72.3737°		
		28	25.6953°	72.3936°		
		29	25.7044°	72.3936°		
		30	25.7044°	72.3538°		
		31	25.7134°	72.3538°		
		32	25.7133°	72.3936°		
		33	25.7225°	72.3936°		
		34	25.7225°	72.4334°		
		35	25.7314°	72.4335°		
		36	25.7314°	72.4534°		
		37	25.7405°	72.4534°		
		38	25.7405°	72.4734°		

		39	25.7314°	72.4734°		
		40	25.7314°	72.4933°		
		41	25.7404°	72.4932°		
		42	25.7585°	72.4933°		
		43	25.7585°	72.3738°		
		44	25.7629°	72.3738°		
		45	25.7667°	72.4136°		
		46	25.7585°	72.4136°		
		47	25.7585°	72.4535°		
		48	25.7676°	72.4535°		
		49	25.7676°	72.4734°		
		50	25.7725°	72.4734°		
		51	25.7745°	72.4934°		
		52	25.7676°	72.4933°		
	Villages	Siwana, Kuseep, Harmalpur				
	Tehsil/Taluk	--				
	District	Balotra				
	State	Rajasthan				
2.	**Area (hectares/square kilometres)**					
	Block Area	130 sq km				
	Forest Area	xx				
	Government Land Area	xx				
	Private Land Area	xx				
3.	**Accessibility**					
	Nearest Rail Head	Bamsin Railway station				
	Road	NH-325				
	Airport	Jodhpur Airport (78 km)				
4.	**Hydrography**					
	Local Surface Drainage Pattern (Channels)	--				
	Rivers/Streams	Luni River				
5.	**Climate**					
	Mean Annual Rainfall	An average rainfall 277 mm per annum				
	Temperatures (December)(Minimum) Temperatures (June)(Maximum)	Minimum temperature 0^0C at night in December to February While the maximum temperature varies 46^0C to 51^0C in March to June				
6.	**Topography**					
	Toposheet Number	45C/5, 45C/6, 45C/9, 45C/10				

	Morphology of the Area	In Siwana eastern block, the area covered with rugged topography with scanty isolated outcrops of granite in a semicircular fashion. The highest peak is Δ375m msl and the lowest peak is Δ149 m msl. In Siwana Central block, the area is characterised by arcuate ridges arranged in a semicircular fashion. The highest peak recorded in Siwana Central block is Δ498m msl situated at top of Bhimgoda ka pahar and the lowest peak is Δ125m msl.
7	**Availability of base line geoscience data**	
	Geological Map (1:50,000)	Available
	Geochemical Map	Available
	Geophysical Map (Aeromagnetic, ground geophysical, Regional as well as local scale GP maps)	Available (Regional Scale)
8.	**Justification for taking up**	Justification for taking up the investigation in G4 stage:

	Preliminary Exploration (G3)	1. Field Season Programme (Item Code: **M2AFGBM-MEP/NC/WR/SU RAJ/2021/36826**) was carried out in the **Indrana–Siwana area, Barmer District, Rajasthan** (Topo sheets **45C/06 & 10**) to assess **REE potential**. The work included **large-scale mapping (100 sq. km at 1:12,500 scale)** along with **petrography, chemical analysis, EPMA and XRD studies**. 2. The area shows **three magmatic phases**: volcanism (dominantly rhyolite), plutonic intrusion (Siwana Granite), and younger intrusive dykes (rhyolitic and mafic). Petrography indicates alkali-rich mineral assemblages, with **monazite, xenotime and allanite** identified as key REE-bearing minerals. 3. Geochemical analysis shows significant enrichment, with **ΣREE+Y ranging from 265 to 8985 ppm in bedrock samples** and up to **8583 ppm in channel samples**. Granites, volcanics, and dykes show favourable REE values with average **HREE/LREE ratios between 0.18–0.26**. Elevated values of associated rare metals were also recorded, including **Zr (up to 10173 ppm), Nb (up to 853 ppm), Zn (up to 920 ppm), Th (up to 77 ppm), and Hf (up to 666 ppm)**.

Detailed description on the following titles to be made in the proposal.

1. Block Summary

Physiography: In Siwana eastern block, the area covered with rugged topography with scanty isolated outcrops of granite in a semicircular fashion. The highest peak is Δ375m msl and the lowest peak is Δ149 m msl. In Siwana Central block, the area is characterised by arcuate ridges arranged in a semicircular fashion. The highest peak recorded in Siwana Central block is Δ498m msl situated at top of Bhimgoda ka pahar and the lowest peak is Δ125m msl.

Climate: The climate is characterized by low rainfall with erratic distribution, extremes of diurnal and annual ranges of temperatures, low humidity and high wind velocity. The arid climate has marked variations in diurnal and seasonal ranges of temperature, characteristic of warm-dry continental climates. During summer (March to June), the maximum temperature generally varies between 46 and 51˚C. Night temperatures decrease considerably to 20–29˚C. January is the coldest month. During winter (December to February), minimum temperatures may fall to 0℃ at night. Occasional secondary western disturbances, which cross mostly western, northern and eastern Rajasthan during the winter months, causing light rainfall and increased wind speeds which result in a wind-chill effect. The average annual temperature in Barmer district is 27.1 °C.

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

The present study area comes under the Trans-Aravalli region, exposed around west and south west of Aravalli Mountain Range. Malani Igneous Suite (MIS) is the largest acid, predominantly volcanic, magmatic assemblage in India representing rocks of polyphase igneous activity. Throughout the time, the rocks have been referred by various names like 'The Malani Volcanic Suite', 'Malani Volcanic Series', 'Malani Igneous Province', 'Malani Beds', 'Malani Volcanics,' 'Malani Rhyolites' or simply 'Malanis'. But the term 'Malani' is strictly associated to describe the rocks of Neoproterozoic polyphase igneous activity, happened roughly in-between 830Ma and 680Ma, age range representing gap between Sirohi Group of Delhis (Choudhary et al., 1984) and Marwar Supergroup (Rathore et al., 1999) respectively. The MIS unconformably overlies the Mesoproterozoics of Delhi's (Bhushan, 2000). The contact between the two has been studied near Manihari and Kankani (La Touche, 1902; Bhushan, 1984; Bhushan, 2000).

The Siwana Ring Complex (SRC) forms a part of the MIS and occupy an area of about 1100 km2 (about 35 km in E-W, 30 km in N-S direction). It displays important features namely volcano-plutonic associations, anorogenic setting and potentials for rare earths and rare metals (Kochhar, 1992; Jain et al., 1996; Vallinayagam and Kochhar, 1998; Bhushan and Chittora, 1999; Kochhar, 2000; Vallinayagam, 2001; Vallinayagam, 2004; Singh and Vallinayagam, 2009).

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

Group/Supergroup	Age	Rock Types
MarwarSupergroup (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 (ArchaeanSupracrustals?)

DESCRIPTION OF LITHOUNITS

Felsic volcanics: Felsic volcanics are dominant litho unit observed in the mapped area. The exposures are plenty around Siwana, Mokalsar, Mailawas, Arjiyana, Devandi and Indrana area. Both porphyritic and aphanitic verities of rhyolite are representing the felsic volcanics of the area. The aphanitic variety is the most common volcanic phase exposed in the area. It is well exposed near Siwana town and Arjiyana, Maliavas, Indrana villages. It also occurs as small isolated hillocks parallel to Siwana – Mokalsar road. Occurrences of ferruginous red coloured variety and greenish grey coloured variants are common. They are characterized by the presence of vesicles (Fig 5.12), cavity fillings and flow bandings at places. Thin veins of iron oxide with a maximum of 1 cm width are ubiquitous along the fracture planes of this variety of rhyolite.

Pyroclastic Flow: Light green coloured volcanic clasts are surrounded by rhyolitic material. The clasts exhibit varying shape and dimension. Volcanic lapilli are also observed towards south east of Arjiyana village.

Siwana Granite: Siwana granite is the major intrusive granite exposed in the area. It is exposed as hills around Indrana, Mokalsar, Maliawas, Ludrara area. Mainly two varieties of granites are observed in the area. The pink coloured porphyritic alkali feldspar rich variety and grey coloured medium to coarse grained variety; both are found intruding into the volcanic phases with a sharp intrusive contact. These granites are characterized by their alkaline nature, well evident from the presence of alkali amphiboles and pyroxenes. The contact relation between the granite variants of the area appears to be diffusive in nature. The grey coloured medium to coarse grained granite has more plagioclase component in comparison to the other variety. The coarse-grained alkali feldspar granite is mostly exposed in the south eastern part of the area with alkali feldspar as a major constituent along with quartz and mafics (alkali amphiboles and alkali pyroxenes). This granite exhibits the presence of rims of feldspar signifying the possibility

of deuteric alteration or magmatic re equilibration process. In this kind of granite, feldspars are observed as inclusions within mafic minerals as well.

Dykes: Alkali feldspar granite exposed near Milavas village The youngest intrusive phases of the area are dykes intruded along the joint planes with discordant as well as sheet type field relation. Mainly two categories of dykes are observed in the area. The flesh colored, fine grained rhyolitic dykes are observed in various localities. Dark colored mafic dykes mostly observed associated with the granites have a typical discordant field relation. The maximum traceable length of the dyke is up to 400 m with variable width. Sub parallel flesh-coloured dykes are exposed near Ludradra and Arjiyana villages. They have a typical anastomosing nature noticed at Ludrara. The dark coloured and relatively coarse-grained mafic variety of dykes are commonly found in the granite hills of Mokalsar area.

3 Mineralisations

The characteristic features of REE mineral phases present in the concerned geological identities are such that none of them are sized enough to be identified through naked eye. A thorough study under highly magnifying optical microscope can only lead to suspect occurrences of very few mineral phases. In view of the chemical analysis results combined with field observations and petrographic studies, the mineralization is essentially magmatic. Later, younger intrusions in the form of dykes and pegmatites are proved to be significant in REE potential. The petrographic evidences suggesting a late magmatic metasomatic episode of mineralization by which certain late magmatic REE mineral phases are formed along with alkali amphiboles amphiboles and alkali pyroxenes. These newly formd minerals are found maily as inclusions within the silicate minerals or as separate growths along the grain boundaries.

4 Scope for proposed exploration:

4.1 To map the REE bearing mineralized zone with the help of surface work.

4.2 Borehole planning will be done on the basis of previous data and present surface work; chemical analysis of samples to be collected from trenches and pits in the potential areas to delineate the lithological thickness of ore zone.

4.3 The objective of this project is to estimate the resource of REE and associated minerals with the help of surface results in the area & drilling results and demarcation of its zone.

5 Previous Work:

- In "Final Report on Reconnaissance Survey for Rare Earth Elements and Associated Mineralization around Indrana Siwana Area, Central Part of Siwana Ring Complex, Siwana (SRC), Barmer District, Rajasthan (G-4 Stage) (field season 2021-22) by Vivek V. Kumar, Sr. Geologist and Dr. Kiran Jyoti Mishra, Sr. Geologist, Field Season Programme (Item Code: **M2AFGBM-MEP/NC/WR/SU RAJ/2021/36826**)" was carried out in the **Indrana–Siwana area, Barmer District, Rajasthan** (Topo sheets **45C/06 & 10**) to assess **REE potential**. The work included **large-scale mapping (100 sq. km at 1:12,500 scale)** along with **petrography, chemical analysis, EPMA and XRD studies**.
- The area shows **three magmatic phases**: volcanism (dominantly rhyolite), plutonic intrusion (Siwana Granite), and younger intrusive dykes (rhyolitic and mafic). Petrography indicates alkali-rich mineral assemblages, with **monazite, xenotime and allanite** identified as key REE-bearing minerals.
- Geochemical analysis shows significant enrichment, with **ΣREE+Y ranging from 265 to 8985 ppm in bedrock samples** and up to **8583 ppm in channel samples**. Granites, volcanics, and dykes show favourable REE values with average **HREE/LREE ratios between 0.18–0.26**. Elevated values of associated rare metals were also recorded, including **Zr (up to 10173 ppm), Nb (up to 853 ppm), Zn (up to 920 ppm), Th (up to 77 ppm), and Hf (up to 666 ppm)**.

6 Block Description

Cardinal points	longitude	latitude
1	72.5030	25.7676
2	72.5133	25.7558
3	72.5131	25.7134
4	72.5331	25.7134
5	72.5331	25.7044
6	72.5131	25.7044
7	72.5130	25.6683
8	72.5330	25.6683
9	72.5330	25.6773
10	72.5529	25.6773
11	72.5527	25.6232
12	72.5129	25.6231
13	72.5129	25.6322
14	72.5328	25.6322
15	72.5329	25.6593
16	72.4732	25.6593
17	72.4733	25.6954
18	72.4334	25.6954
19	72.4333	25.6683
20	72.4135	25.6683
21	72.4134	25.6503
22	72.3736	25.6502
23	72.3736	25.6683
24	72.3538	25.6683
25	72.3538	25.6773
26	72.3736	25.6773
27	72.3737	25.6953
28	72.3936	25.6953
29	72.3936	25.7044
30	72.3538	25.7044
31	72.3538	25.7134

Cardinal points	longitude	latitude
32	72.3936	25.7133
33	72.3936	25.7225
34	72.4334	25.7225
35	72.4335	25.7314
36	72.4534	25.7314
37	72.4534	25.7405
38	72.4734	25.7405
39	72.4734	25.7314
40	72.4933	25.7314
41	72.4932	25.7404
42	72.4933	25.7585
43	72.3738	25.7585
44	72.3738	25.7629
45	72.4136	25.7667
46	72.4136	25.7585
47	72.4535	25.7585
48	72.4535	25.7676
49	72.4734	25.7676
50	72.4734	25.7725
51	72.4934	25.7745
52	72.4933	25.7676

6.1 Planned Methodology

In accordance with the objectives set for Reconnaissance Survey (G4 level of exploration) in RSRC B Block, Balotra District, Large scale geological mapping in 1:12,500 scale, surface sampling, ground geophysical survey, core drilling, core sampling, chemical studies, petrological and mineralogical studies are proposed in the block. The exploration will be carried out as per Minerals (Evidence of Mineral contents) Rules-Ammended in 2021. Accordingly, the details of different activities to be carried out are presented in subsequent paragraphs.

6.2 Geological Mapping

Large Scale Geological mapping on 1:12,500 scale in the area (130 sq. km) will be carried out by taking geological traverses. The contacts of different lithologies, surficial lithology, structural features, etc. will be noted in detail. The geological map on 1:12,500 scale will be generated based on the details gathered during the field visit.

6.3 Borehole plan:

Vertical boreholes are to be planned, beginning with 1 borehole in 8 sq. km, followed by 1 borehole in 4 sq. km, and subsequently 1 borehole in 2 sq. km (2km/ 1km grid interval), based on results obtained.

6.4 Core Drilling

Keeping in view of the lithotype and based on the outcome of the geological mapping, 15 Nos of vertical boreholes will be proposed for first phase**. First level boreholes will be drilled in 4 km X 2 km spacing (8 sqkm). The second phase, boreholes will be proposed of 100m on the basis of outcome of first level of borehole at 4km X 1 KM grid interval (4 sqkm)** and in 3rd Phase, boreholes will be proposed at 2 km X 1 km grid interval (2 sqkm). The total 1500+2000+3000=6500 m core drilling is being proposed over the area 130 sq km.

6.5 Core Logging

The drill cores would be logged systematically viz. details of litho-units, colour, structural feature, texture, mineralization, rock quality designation and type of ore would be recorded.

6.6 Core Sampling

The drill core will be split into two equal halves and one part would be preserved in the core box. The other half will be powdered to 200 mesh size and the same would be divided into four parts (250 g each) through coning and quartering. One part of 250 g sample will be sent to chemical laboratory for analysis, second part to be preserved in the camp as duplicate sample, third part to be utilized for preparing composite sample for individual ore band and the fourth part would be kept as either check sample or sample to be used for any other specific purpose.

The length of each core sample will be kept 0.50 m-1.0 m depending upon the width of particular types of ore and its physical character. The primary core samples will be analyzed for Major oxides and trace elements by XRF methods.

Surface samples and borehole core samples would be analyzed by ICPMS to ascertain the presence of any critical mineral in anomalous concentration.

6.7 Petrographic & Mineralographic Studies

Thin and polished sections will be prepared from outcrop samples and the core samples and those will be studied for detailed petrographic and mineralographic characteristics. These samples will be drawn from ore zones and associated rocks. A provision of 30 nos. specimens for petrographic and 30 nos. specimens for mineralographic studies is kept for the proposed area.

In addition, bulk density determination of 10 nos. of samples will be carried out for the proposed block.

7 Nature Quantum and Target for G4 stage

Quantum of work for Preliminary Exploration (G4 Stage) of RSRC B Block			
Sl No.	**Item of work**	**Unit**	**Quantity**
A	**Large Scale Geological Mapping**		
1	on 1:12,500 Scale	sq. km	130
B	**Survey Work by surveyor days**		

1	Demarcation of proposed boundary, Fixation of Borehole and determination of co-ordinates & Reduced Level (RL) of the boreholes by DGPS	Per point of observation	52+65
C	**Geophysical survey**		
1	Magnetic survey (10-30 L.Km)	Per LKM	638
2	Charge for Gravity survey (10–12 line km)	per station	6483
D	**Surface sampling**		
1	BRS with 10% external check	Nos	50+5=55
E	**Drilling**		
1	Core drilling	m	6500
2	Borehole Pillaring (12"x12"x30")	nos	65
F	**Chemical Analysis**		
i)	Surface samples + Core Samples + 10% Check Samples Chemical analysis by XRF radicals (Mn%, MnO%, Al2O3%, Fe%, Fe2O3%, SiO2%, P%, S%, In-solubles & LOI) + other oxides and traces	nos	10+40=50 External check =5
ii)	Analysis of one rock/ soil sample for quantitative analysis of 14 REE elements+9 Trace elements (U, Ta, Ge, Be, Hf, Sn, As, Rb, Th) by ICP-MS	nos	50+3000=3050 305 external checks
G	**Physical Analysis**	**nos**	
1	Preparation of polished thin section of rock	nos	30
2	Complete Petrographic Studies	nos	30
3	Preparation of polished thin section of rock.	Nos	10
4	EPMA studies	Nos	30
5	SEM studies	Nos	30
H	**Bulk Density Determination**	**nos**	10
I	**3D ore body modelling using compatible software**		
J	Report Preparation (as per MEMC Amendment Rule 2021/UNFC)	**nos**	**1**

References

- Reconnaissance Survey (G4) for Au and REE mineralization in and around Pargela and Dandudih area, Purulia Dist. West Bengal (Final Report for the Field Season 2023-24) By Ara Aurora, Sr. Geologist & Shampa Halder, Geologist.

List of Plates

Plate 1 Proposed block boundary over Survey of India topographic map 45C/5, 45C/6, 45C/9 and 45c/10 on 1:50,000

Plate 2 Proposed block boundary over Regional Geological map

SURVEY AREA OVER SURVEY OF INDIA TOPOSHEET

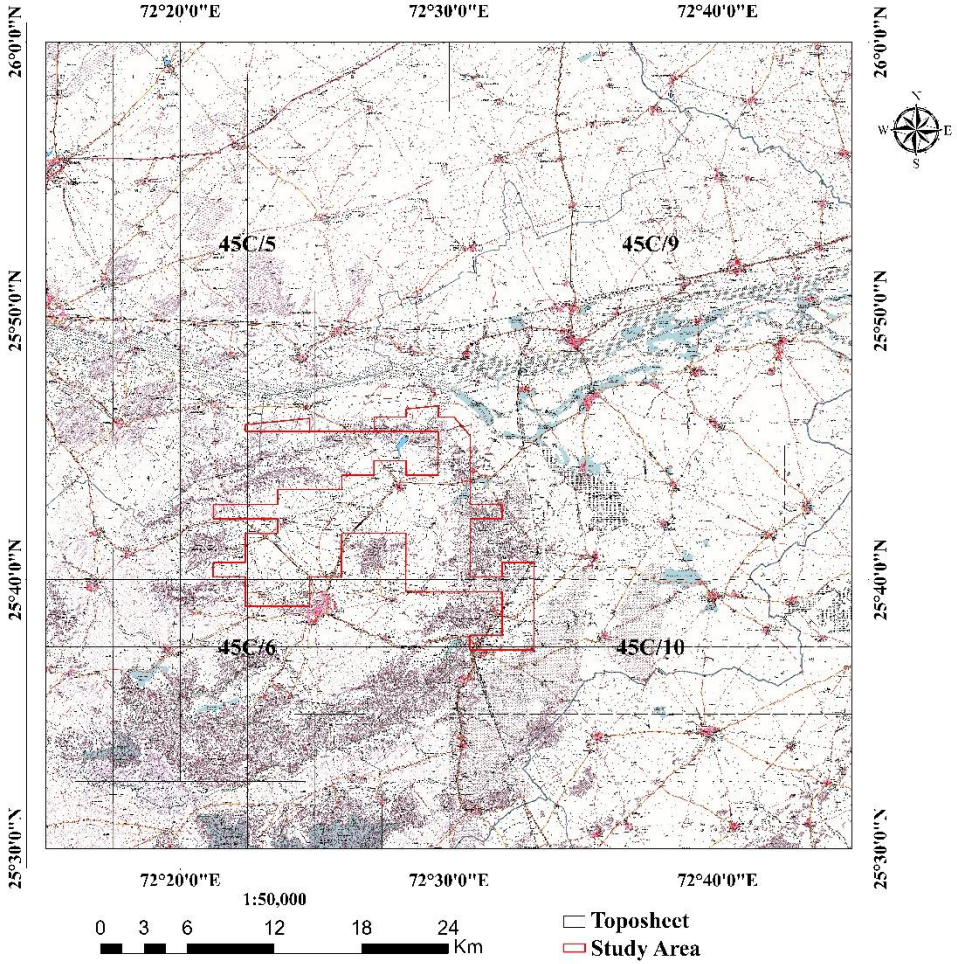

Plate 1 Proposed block boundary over Survey of India topographic map 45C/5, 45C/6, 45C/9 and 45C/10 on 1:50,000

GEOLOGICAL MAP OF THE STUDY AREA

BALOTRA DISTRICT, RAJASTHAN

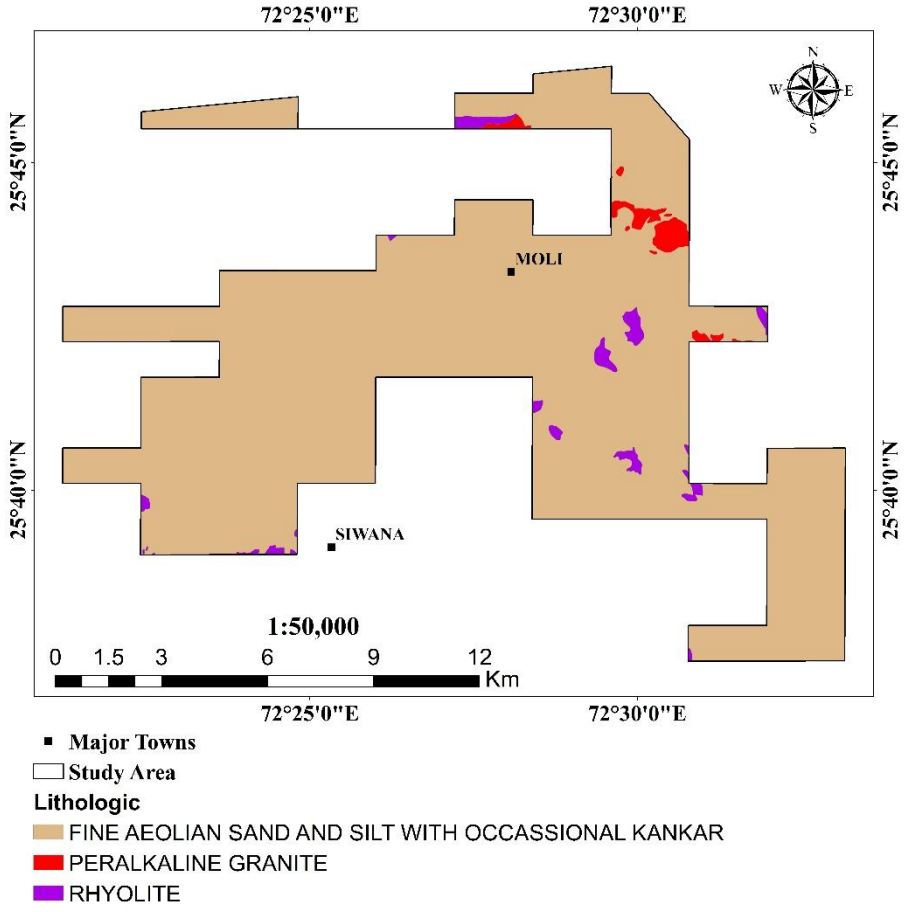

Plate 2 Proposed block boundary over Geological Map of 1:50,000 scale

1. **Manpower deployment**

Table-4 Time Schedule/Action Plan for Reconnaissance Survey (G4 stage) of REE in RSRC B Block, Balotra District, Rajasthan																				
S. No	Nature of Work	Months																		
		1	2	3	4	5	REVIEW	6	7	8	REVIEW	9	10	11	REVIEW	12	13	14	15	16	17	18
1	Camp Set up																					
2	Geological mapping (LSM) (130 sq km)																					
3	Geophysical survey (Magnetic and gravity survey) (L.km)																					
4	Bed rock samples																					
5	Sample preparation and analysis																					
6	DGPS survey for fixation of borehole and cardinal points																					
7	Sub surface exploration – Drilling (m) 1st Phase drilling																					
8	Receipt of analyses and processing of analytical data																					
9	Sub surface exploration – Drilling (m) 2nd Phase drilling																					
10	Receipt of analyses and processing of analytical data																					
11	Sub surface exploration –																					

Table-4 Time Schedule/Action Plan for Reconnaissance Survey (G4 stage) of REE in RSRC B Block, Balotra District, Rajasthan																						
	Drilling (m) 3rd Phase drilling																					
12	Receipt of analyses and processing of analytical data																					
13	Ore body modelling																					
14	Geological Report preparation																					

2. Break-up of expenditure

Cost Estimate of Reconnaissance Survey (G4 Stage) of REE in RSRC B Block, Balotra District, Rajasthan							
Total area - 1.21 Sq.km; Borehole - 10 (05 BH first level + 05 BH second level) ; Meterage - 600 m (250 m first level+ 350 m second level, Period of completion - 18 months, 1st Review - After Geophysics, 2nd review- after 1st phase drilling, 3rd review- after 2nd phase drilling							
SL.No	**Item Of Work***	**Unit***	**Rate As Per NMEDT SOC**		**Estimated Cost of the Proposal**		
			SOC. Item No	**Rate As Per SOC* (a)**	**Qty. (b)**	**Total Amount (Rs) (a*b)**	**Remarks**
A	**Large scale Geological Mapping Other Geological Work & Surveying**						
i	Large scale Geological mapping (1:12,500)	Per Sq Km	1.1	18,300	130	23,79,000	
ii	a. Charges for 2 Geologist per day (Field) for Geological mapping & Trenching work, drilling activity (without labour)	day	1.2.1a	₹ 14,500.00	200	₹ 29,00,000.00	
iii	b. Labours charges; Base rate (for 2 labours per geologists)	day	5.7	₹ 541.00	400	₹ 2,16,400.00	Amount will be reimbursed as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher.
iv	c. Charges for Geologist per day (HQ)	day	1.2.1a	₹ 10,500.00	120	₹ 12,60,000.00	
v	Charges for one Sampler per day (1 Party)	one sampler per day	1.2.1b	₹ 7,850.00	240	₹ 18,84,000.00	
vi	Charges for Labour	day	5.7	₹ 541.00	960	₹ 5,19,360.00	
	Sub Total- A					**91,58,760**	
B	**Survey work**						
i	DGPS Survey for BH fixation and Cardinal Points of block	Per Point of observation	1.3.2	₹ 24,000.00	117	₹ 28,08,000.00	65 BH and 52 Cardinal Points of block boundary.

Cost Estimate of Reconnaissance Survey (G4 Stage) of REE in RSRC B Block, Balotra District, Rajasthan							
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SL.No	**Item Of Work***	**Unit***	**Rate As Per NMEDT SOC**		**Estimated Cost of the Proposal**		
			SOC. Item No	**Rate As Per SOC* (a)**	**Qty. (b)**	**Total Amount (Rs) (a*b)**	**Remarks**
		of observation					
ii	Labours Charges for survey work; Base rate	day	5.7	₹ 541.00	30	₹ 16,230.00	
	Sub Total- B					**₹ 28,24,230.00**	
C	**Ground Geophysical Survey (in-house)**						
i	Charge for Magnetic survey (10–12 line km)	Line km	3.2a	₹ 1,800.00	638	₹ 11,48,400.00	In 200m profile spacing and 100m data point spacing
ii	Charge for Gravity survey (10–12 line km)	per station	3.1a	₹ 3,800.00	6483	₹ 2,46,35,400.00	
iii	Charges for Geophysicist at Headquarters	day	3.18a	₹ 10,500.00	30	₹ 3,15,000.00	
	Sub Total- C					**₹ 2,60,98,800.00**	
D	**Drilling (after review) (in-house)**						
i	Systematic Drilling (Hard rock (HQ) 1st, 2nd and 3rd phase BH)	per m	2.2.1.1 d	₹ 10,000.00	6500	₹ 6,50,00,000.00	1 borehole in 8 sq. km, followed by 1 borehole in 4 sq. km, and subsequently 1 borehole in 2 sq. km, based on results obtained. Each borehole 100 m
ii	Land / Crop Compensation (in case the BH falls in agricultural Land)	per borehole	5.6	₹ 30,000.00	65	₹ 19,50,000.00	As per actuals as certified by local authorities subject to a maximum of 30000 per borehole
iii	Construction of concrete Pillar (12"x12"x30")	per borehole	2.2.7	₹ 2,000.00	65	₹ 1,30,000.00	
iv	Drill Core Preservation	per metre	X	₹ 1,590.00	3,500	₹ 55,65,000.00	One complete borehole + Mineralized zone

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SL.No	**Item Of Work***	**Unit***	**Rate As Per NMEDT SOC**		**Estimated Cost of the Proposal**		
			SOC. Item No	**Rate As Per SOC* (a)**	**Qty. (b)**	**Total Amount (Rs) (a*b)**	**Remarks**
v	Transportation of Drill Rig & Truck associated per drill (2 rig),Accomodation Charges for drilling Camp,Drilling Camp Setting/Winding up Cost,Road Making &Drill Core Preservation		2.2.9			₹ 25,00,000.00	For drilling cost more than 2 cr, 10% of the drilling cost with a maximum ceiling of ₹25 lakh.
	Sub Total- D					**₹ 7,51,45,000.00**	
E	**Laboratory Studies**						
1	**Chemical Analysis**						
i)	**Geochemical Sampling-Surface samples (Groove/Channel)**						
a	Major oxides (WD XRF)- (oxides+ trace-24 elements) (BRS & Core Samples)	Nos	4.1.17a	₹ 4,200.00	50	₹ 2,10,000.00	BRS- 10, BH:40
b	Check samples (10% External) (BRS & Core Samples)	Nos	4.1.17a	₹ 4,200.00	5	₹ 21,000.00	
c	Analysis of one rock/ soil sample for quantitative analysis of 14 REE elements+9 Trace elements (U, Ta, Ge, Be, Hf, Sn, As, Rb, Th) by ICP-MS (sequential technique)	Per Sample	4.1.15	₹ 7,400.00	3050	₹ 2,25,70,000.00	BRS=50, 1ST, 2ND AND 3RD PHASE-ALL LITHO EXCEPT SOIL COVER=3000
d	Surface Check samples (10% External)analysis of rock sample for quantative analysis of 14 REE elements +9 trace elements by ICP-MS	Per Sample	4.1.15	₹ 7,400.00	305	₹ 22,57,000.00	
2	**Physical & Petrological Studies**						
i	Preparation of polished thin section of rock	Nos	4.3.2	₹ 800.00	30	₹ 24,000.00	

Cost Estimate of Reconnaissance Survey (G4 Stage) of REE in RSRC B Block, Balotra District, Rajasthan							
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SL.No	**Item Of Work***	**Unit***	**Rate As Per NMEDT SOC**		**Estimated Cost of the Proposal**		
			SOC. Item No	**Rate As Per SOC* (a)**	**Qty. (b)**	**Total Amount (Rs) (a*b)**	**Remarks**
ii	Complete petrographic/ ore microscopic study/ mineragraphic report of rock sample (along with 5 nos. digital photomicrographs)	Nos	4.3.4	₹ 2,800.00	30	₹ 84,000.00	
iii	Bulk density analysis	Nos	4.8.3	₹ 2,500.00	10	₹ 25,000.00	
iv	EPMA studies per hour	hour	4.4.1	₹ 8,540.00	90	₹ 7,68,600.00	3 hrs per sample, total no of samples 30
v	SEM studies per hour	hour	4.4.1a	₹ 2,940.00	90	₹ 2,64,600.00	3 hrs per sample, total no of samples 30
	Sub Total- E					**₹ 2,62,24,200.00**	
F	**Total A to E**					**₹ 13,94,50,990.00**	
G	**Geological Report Preparation**	**5 Hard copies with a soft copy**	**5.2**			**₹ 7,50,000.00**	**Reimbursement will be made after submission of the Final Geological Report in Hard Copies (5 Nos) and the soft copy to NMET.**
H	**Peer review Charges**	**As per EC decision**		**₹ 30,000.00**	**1**	**₹ 30,000.00**	
I	**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 less**		**₹ 5,00,000.00**	**EA will be reimbursed after submission of the Hard Copies and the soft copy of the final proposal along with Maps and Plan as suggested by the TCC-NMET in its meeting while clearing the proposal.**
J	**3D Ore Body Modelling using compatible software**	**Lumpsum**	**5.4**			**₹ 8,00,000.00**	**As rates varies from mineral to mineral and on mode of occurrence, hence charges applicable would be as per actual, based on market survey**

Cost Estimate of Reconnaissance Survey (G4 Stage) of REE in RSRC B Block, Balotra District, Rajasthan							
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SL.No	**Item Of Work***	**Unit***	**Rate As Per NMEDT SOC**		**Estimated Cost of the Proposal**		
			SOC. Item No	**Rate As Per SOC* (a)**	**Qty. (b)**	**Total Amount (Rs) (a*b)**	**Remarks**
K	**Total Estimated Cost without GST**					**₹ 14,15,30,990.00**	
L	**Provision for GST (18% of L)**					**₹ 2,54,75,578.20**	**GST will be reimbursed as per actual and as per notified prescribed rate**
M	***Total Estimated Cost with GST***					***₹ 16,70,06,568.20***	
				Rs. In Lakhs		***₹ 1,670.07***	