

COMMODITY: FERTILISER MINERAL (POTASH)

**PROPOSAL FOR PRELIMINARY INVESTIGATION FOR POTASH IN
JAKHARANWALI SOUTH BLOCK, BHARUSARI SUB-BASIN, NAGAUR-
GANGANAGAR EVAPORITE BASIN, HANUMANGARH DISTRICT, RAJASTHAN**

(G3)



**BY
GEOLOGICAL SURVEY OF INDIA
STATE UNIT: RAJASTHAN**

PLACE: JAIPUR

DATE: JULY 2026

Summary of the Block for G3 Level Exploration

GENERAL INFORMATION ABOUT THE BLOCK

Feature	Details
Block ID	JAKHARANWALI SOUTH BLOCK
Exploration Agency	Geological Survey of India, Western Region, State Unit: Rajasthan
Commodity	Fertilizer Mineral (Potash)
Mineral Belt / Geological Domain	Bharusari sub-basin, Nagaur-Ganganagar Evaporite Basin
Block Area	3.84 sq. km.
Completion Period	One year
Objectives	To assess and evaluate the resource of potash and associated mineralisation in Jakharanwali south block.
Projected Outcome	Preliminary exploration data for resource appraisal and further advancement of the block.
Personnel	Two Geoscientists
Expected Field Days	Officer-1: 100 days; Officer-2: 50 days; Supervisory Officer: 7 days
Toposheet / Degree Sheet	44K/3
District / State	District: Hanumangarh, Rajasthan

1. Location

BLOCK

Location	Latitude	Longitude
A	74° 10' 32.916" E	29° 19' 4.493" N
B	74° 10' 32.539" E	29° 19' 56.502" N
C	74° 12' 1.426" E	29° 19' 57.077" N
D	74° 12' 1.821" E	29° 19' 5.221" N
Tehsil/Taluk	Pilibanga	
District	Hanumangarh	
State	Rajasthan	

1. Area

Block Area	3.8 sq. km.
Forest Area	NA
Government Land Area	Data not available
Private Land Area	Data not available

2. Accessibility

Nearest town	Pilibanga Tehsil, about 30 km to the northwest
District headquarters	Hanumangarh, about 35 km North of northeast
Nearest Rail head	Hanumangarh, about 35 km North of northeast
Nearest Airport	Bathinda airport (Punjab State), 150 km

3. Hydrography: Ephemeral streams

4. Climate: Arid to semi arid.

5. Topography: Undulating aeolian sand covered area.

6. Availability of baseline geoscience data

Geological map	Regional geological maps and geological mapping of the Nagaur–Ganganagar Evaporite Basin and earlier G4 investigations by GSI in and around the proposed block.
Geochemical data	Chemical analytical data of potash, halite, lithium, strontium and associated major, minor and trace elements from drill-core samples and intervening zones.
Geophysical data	Regional geophysical survey data used for delineation of evaporite sub-basins and potash-bearing horizons.

7. Justification for taking up G3 level exploration

1. Previous GSI and MECL investigations have established extensive potash mineralization in the Bharusari sub-basin through drilling, confirming the favorable potential of the area for detailed exploration.
2. FS 2023-24, G4 exploration in the Jakharanwali block intersected significant potash-bearing horizons, including high-grade zones, indicating the continuation of mineralization towards the proposed block.

3. Reconnaissance (UNFC-334) resources of potash have already been established in the Jakharanwali block, providing a strong basis for upgrading the exploration to G-3 stage.
4. Anomalous lithium and high strontium concentrations associated with the evaporite sequence indicate the potential for associated critical mineralization, warranting systematic evaluation.
5. The proposed G-3 investigation is aimed at establishing the continuity, thickness, grade and resource potential of potash mineralization in the southern extension of the Jakharanwali block through closely spaced drilling.



**FOR PRELIMINARY (G-3) INVESTIGATION FOR POTASH IN JAKHARANWALI
SOUTH BLOCK, BHARUSARI SUB-BASIN, NAGOUR-GANGANAGAR EVAPORITE
BASIN, HANUMANGARH DISTRICT, RAJASTHAN**

1.1.0 INTRODUCTION

Potash is a strategically important mineral resource and an essential fertilizer mineral for agricultural production. The Nagaur–Ganganagar Evaporite Basin of Rajasthan hosts thick evaporite sequences of the Hanseran Evaporite Group within the Marwar Supergroup and is recognized as one of the most prospective potash-bearing basins in the country.

Earlier investigations by GSI and MECL have established significant potash mineralization in several sub-basins, including Bharusari, through geological mapping, geophysical surveys and exploratory drilling. FS 2023-34 one G4 stage exploration in the Jakharanwali block has further confirmed the presence of potash-bearing horizons along with encouraging lithium and strontium values, indicating the potential for associated critical mineralization.

The proposed G-3 stage investigation in the Jakharanwali South Block is aimed at establishing the continuity, thickness, grade and resource potential of the potash-bearing horizons through systematic drilling and detailed geological investigations, thereby facilitating resource estimation and advancing the exploration status of the area..

2.1.0 BACKGROUND INFORMATION

The Jakharanwali South Block is located in the Bharusari sub-basin of the Nagaur–Ganganagar Evaporite Basin, where thick evaporite sequences of the Hanseran Evaporite Group host potash-bearing halite cycles within the Marwar Supergroup.

GSI carried out regional exploration in the basin during 1974–1991, followed by G4, G3 and G2 stage investigations in different sub-basins. G4 stage exploration was carried out in the Jakharanwali block established encouraging potash mineralization along with anomalous lithium and strontium values, indicating the extension of mineralization towards the proposed block.

The proposed programme represents the upgradation of the positive G4 exploration target to G3 stage with the objective of establishing the continuity, thickness, grade and resource potential of potash-bearing horizons through systematic drilling. In addition, the investigation will evaluate the associated lithium and strontium mineralization occurring within the evaporite sequence.

The proposal forms part of GSI's exploration programme for the Nagaur–Ganganagar Evaporite Basin and is aimed at generating the geological and drilling data required for resource estimation and advancing the exploration status of the block.

3.1.0 LOCATION AND ACCESSIBILITY

Jakharanwali South Block lies in the Bharusari sub-basin of the Nagaur–Ganganagar Evaporite Basin, Rajasthan, in Toposheet No. 44K/3. Rawatsar serves as the nearest urban center, approximately 20 km east of the Jakharanwali South Block. The region enjoys convenient rail connectivity through the Bikaner-Surathgarh-Ganganagar rail line and road access via the Bikaner Highway (NH-62) which traverses in close proximity to the Bharusari Basin. Suratgarh is the nearest railway station, while Bikaner is situated around 140 km from the study area. Hanumangarh Junction is about 35km from the Jakharanwali South Block.

4.1.0 PHYSIOGRAPHY, DRAINAGE AND CLIMATE

The block lies within the northwestern part of the Thar Desert in the Nagaur–Ganganagar Evaporite Basin, where the terrain is predominantly flat to gently undulating and is largely covered by Quaternary aeolian sand, alluvium and interdunal plains. Natural drainage is poorly developed and consists mainly of ephemeral channels that flow only during the monsoon, while irrigation canals locally influence the surface drainage pattern. The climate is arid to semi-arid, characterized by very hot summers, cool winters, low annual rainfall (about 200–350 mm), and high evaporation rates.

5.1.0 PREVIOUS WORK

GSI carried out potash exploration in the Nagaur–Ganganagar Evaporite Basin during 1974–1991 by drilling 70 boreholes over an area of about 50,000 km², leading to the delineation of eight potash-bearing sub-basins, namely Lakhasar, Bikaner, Gharsisar, Hanseran, Arjunsar, Jaitpura, Bharusari and Satipura (Kumar et al., 1994). In the Bharusari sub-basin, six boreholes were drilled and potash resources of 388.31 million tonnes with an average grade of 4.68% K were estimated over an area of 71 km².

During FS 2016-17 to 2023-24, GSI completed nine G3 stage and one G2 stage investigations in the Satipura sub-basin and G4 stage investigations in the Hanseran, Jaitpura and Bharusari sub-basins. In the Satipura sub-basin, inferred (333) potash resources of 1017.504 million tonnes at 2% cut-off grade (average 3.868% K₂O), 192 million tonnes at 5% cut-off grade (average 9.698% K₂O) and 94.986 million tonnes at 8% cut-off grade (average 14.351% K₂O) were established. Gross inferred halite resources of 18,993 million tonnes at 31.47% cut-off grade (equivalent to 80% NaCl) with an

average grade of 35.90% Na were also estimated.

MECL (2020–2022) drilled 12 boreholes (7,868 m) in the north-central part of the Bharusari sub-basin, identifying seven halite cycles with potash-bearing zones ranging from 1.00 to 15.50 m in thickness and grades varying from 1.03% to 3.47% K. Subsequently, GSI carried out G4 stage exploration in the Jakharanwali block during FS 2023–24, where boreholes RJNGJW-01 and RJNGJW-02 intersected potash zones up to 3.24 m thick with weighted average grades of 7.10% K and 18.00% K. The investigation also recorded lithium values up to 361 ppm and strontium values up to 6730 ppm, resulting in the estimation of reconnaissance (UNFC-334) potash resources and providing the basis for the proposed G3 stage investigation in the Jakharanwali South Block.

6.1.0 GEOLOGY OF THE AREA

The proposed Jakharanwali South Block lies within the Bharusari sub-basin of the Nagaur–Ganganagar Evaporite Basin, where the Marwar Supergroup unconformably overlies the basement rocks of the Malani Igneous Suite and/or Delhi Metamorphics. The Marwar Supergroup comprises the Jodhpur, Hanseran Evaporite and Nagaur groups and is concealed beneath thick Quaternary and locally Tertiary sediments.

The Hanseran Evaporite Group consists of cyclic halite deposits containing polyhalite, sylvite and sylvinite, with intervening horizons of anhydrite, clay, dolomite and magnesite. Previous drilling in the Bharusari and adjoining Jakharanwali blocks has established the occurrence of multiple potash-bearing halite cycles, indicating favorable geological conditions for systematic G3 stage exploration in the proposed block.

7.1.0 OBJECTIVES OF THE PROPOSED EXPLORATION PROGRAMME

To carry out detailed geological mapping on 1:4,000 scale and establish the geological framework of the proposed Jakharanwali South Block.

To establish the lateral continuity, thickness, depth and grade of potash-bearing horizons through systematic core drilling and borehole logging.

To generate adequate geological, lithological and geochemical data for resource estimation of potash and associated halite mineralization, and to evaluate the occurrence of any associated lithium and strontium mineralization within the evaporite sequence.

To upgrade the exploration level of the block to G-3 stage by generating reliable geological and

analytical data for estimation of inferred (333) mineral resources in accordance with UNFC guidelines.

8.1.0 PROPOSED SCHEME OF EXPLORATION

The proposed G3 exploration program comprises detailed geological mapping, systematic core drilling, borehole logging, geological and geochemical sampling, laboratory analyses, and specialized studies. Detailed geological mapping on 1:4,000 scale will be carried out over 3.84 sq. km to delineate the geological framework and correlate the evaporite sequence with adjoining explored areas.

A total of 05 vertical boreholes will be drilled on an approximate 800 m grid spacing with reference to borehole RJNGJW-02 to establish the continuity, thickness, depth and grade of the potash-bearing horizons. The average depth of each borehole will be about 700 m (± 20 m). Non-coring drilling will be carried out up to 300 m, followed by core drilling from 300 m to the termination of the borehole to achieve the geological objectives of the investigation.

Systematic core logging, borehole sampling and laboratory analyses will be undertaken for potash-bearing horizons as well as intervening lithological units. In addition to potash and halite, lithium and strontium will be analyzed from suitable samples. Selected samples will also be subjected to fluid inclusion and isotopic studies to understand the origin, depositional environment and evolution of the evaporite basin.

9.1.0 QUANTUM OF WORK

Item of Work	Unit	Proposed Quantum
Detailed geological mapping (1:2,000)	sq. km	3.84
Subsurface exploration: drilling	m	3500
Borehole geophysical logging	m	2000
PCS	nos.	20
Core samples (CS)	nos.	700
PS	nos.	10
XRD	nos.	20
Fluid inclusion study	nos.	3
Isotope studies	nos.	3
Chemical analyses	nos.	720

10.1.0 COST

Summary of the Cost estimates

Summary of the Cost estimates (NMEDT-funded components costed on the Revised Schedule of Charges effective 15.12.2025, as modified on 10.02.2026). Detailed line-item computation is provided in the accompanying cost sheet.

Sl. No.	Item	Total Estimated Cost (Rs.)	Funding
1	Geology and Survey	0	
2	Drilling	26000000	NMEDT
3	Survey work	0	
4	Laboratory studies	0	
5	Geologist at HQ	0	
	Sub Total (1 to 4)	26000000	NMEDT
6	Exploration Report Preparation	0	
7	Proposal Preparation	0	
8	Peer review charges	0	
	Sub Total (1 to 8)	26000000	NMEDT
9	GST 18%	4680000	NMEDT
	Total:	30680000	NMEDT
	Say Rs. In Lakh	306.8	NMEDT

PROPOSAL FOR Preliminary investigation for potash in Jakharanwali south block, Bharusari sub-basin, Nagaur-Ganganagar Evaporite Basin, Hanumangarh District, Rajasthan G-3

Item of Work			Unit	SoC-Item -Sl No. NMEDT	Rates as per NMEDT SoC 2025 (w.e.f. 15.12.2025, incl. 10.02.2026 modification)	Rates of GSI for NMEDT work		Estimated Cost		Remarks
								Qty.	Total Amount (Rs)	
D. DRILLING - OUTSOURCED										
18.b		Drilling in Hard rock / Strata: HQ size borehole up to 400m depth and NQ beyond 400m; rate decreases 20% if NQ before 400m	m	2.2.1.1d	10000	-	-	2000	20000000	5 Vertical boreholes. All boreholes are planned to a depth of 700-720 m, which exceeds 400 m. Therefore, HQ core size will be maintained from 300m to borehole until completion, with no reduction to NQ size.
19		Non coring drilling	m	2.2.4	4,000.00	-	-	1500	6000000	Each borehole non coring drilling will be carried out up to 300m
20	DRILLING RELATED EXPENDITURE HEADS	Borehole Deviation Survey by Multishot survey tool (interval 6m; azimuth and inclination to be recorded)	per shot	2.2.5	330	-	-	0	0	
21		Land / Crop Compensation (in case the BH falls in agricultural land)	per BH	5.6	30000	-	-	0	0	
22		Construction of concrete Pillar (12"x12"x30")	per borehole	2.2.7	2000	-	-	0	0	

23		Borehole plugging with cement	per borehole	2.2.8		10000	-	-	0	0	
24		Miscellaneous Charges (Transportation of Drilling Rig, Drill Camp accommodation, camp setting & winding, approach road)	Lumpsum	2.2.9		NOT INCLUDED	-	-	0	0	
25		Drill Core Preservation - one complete BH plus mineralised cores of all BHs preserved in GI core boxes and transported to notified core repository	per m	X (5.2)		1590	-	-	0	0	
Total Cost D - outsourced										26000000	
Total										26000000	
GST 18%										4680000	
Total (including 18% GST)										30680000	
Say Rs. in Lakh										306.8	

11.1.0 TIME SCHEDULE

The work programme is proposed for FS 2026–27, with field, laboratory, reporting, and circulation milestones as summarised below.

The proposed exploration programme is planned in such a way that all the activities like detailed mapping, drilling, logging, core sampling geophysical logging and associated geological work and laboratory work will be completed within 10 months. Report writing will take 3 months with 2 months overlap for laboratory analysis. Thus, the total duration of the project for completion of the above exploration will be 12 months from the date of commencement of the project.

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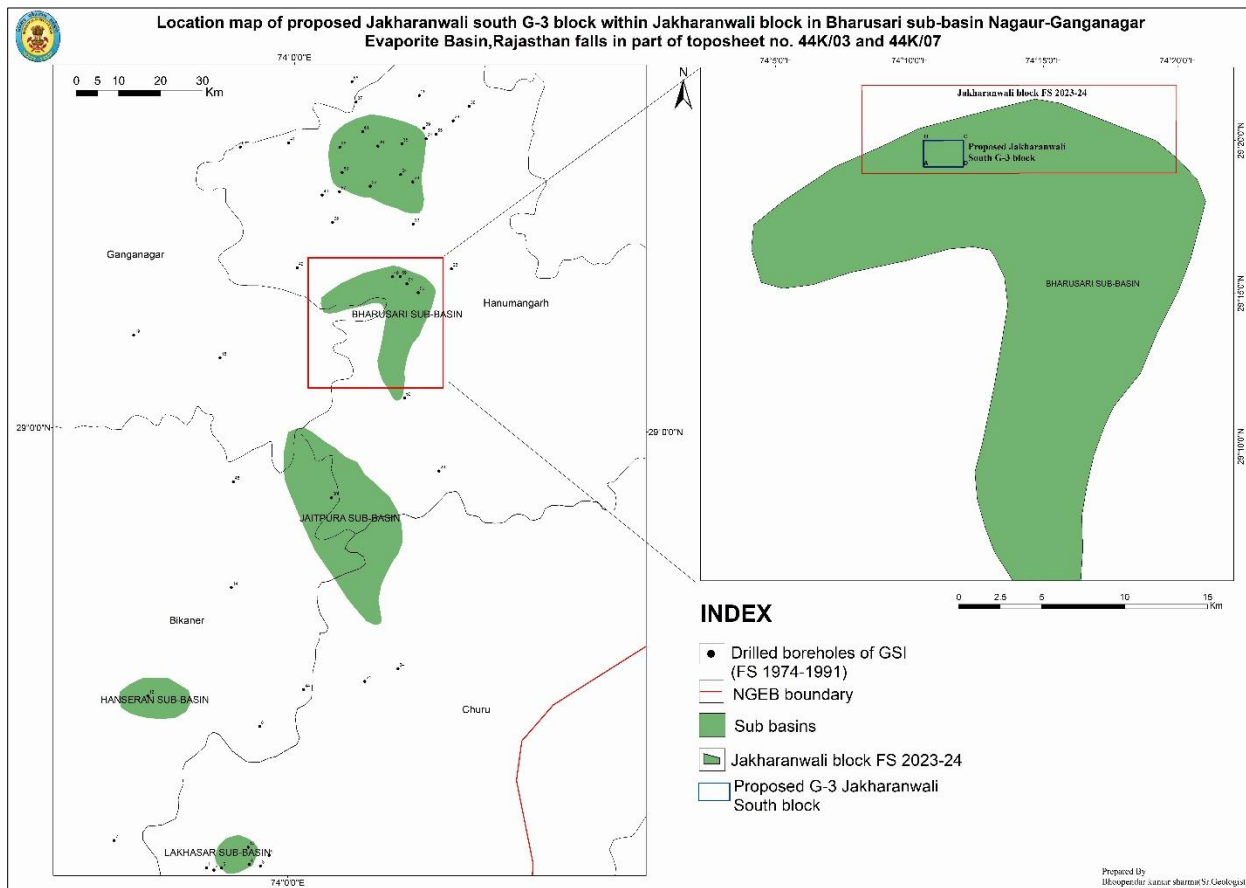


Fig 1 Location map of Jakharanwali south G-3 block in Bharusari sub-basin of Nagaur-Ganganagar Evaporite Basin, Hanumangarh District, Rajasthan



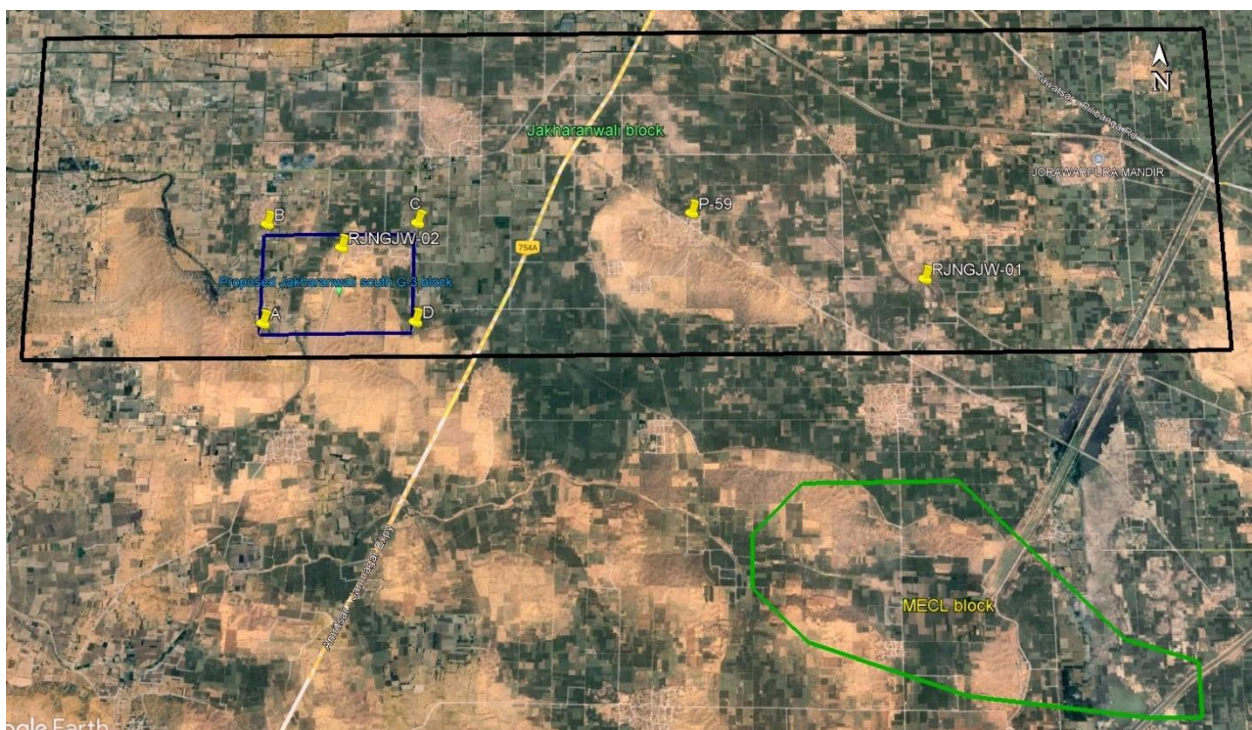
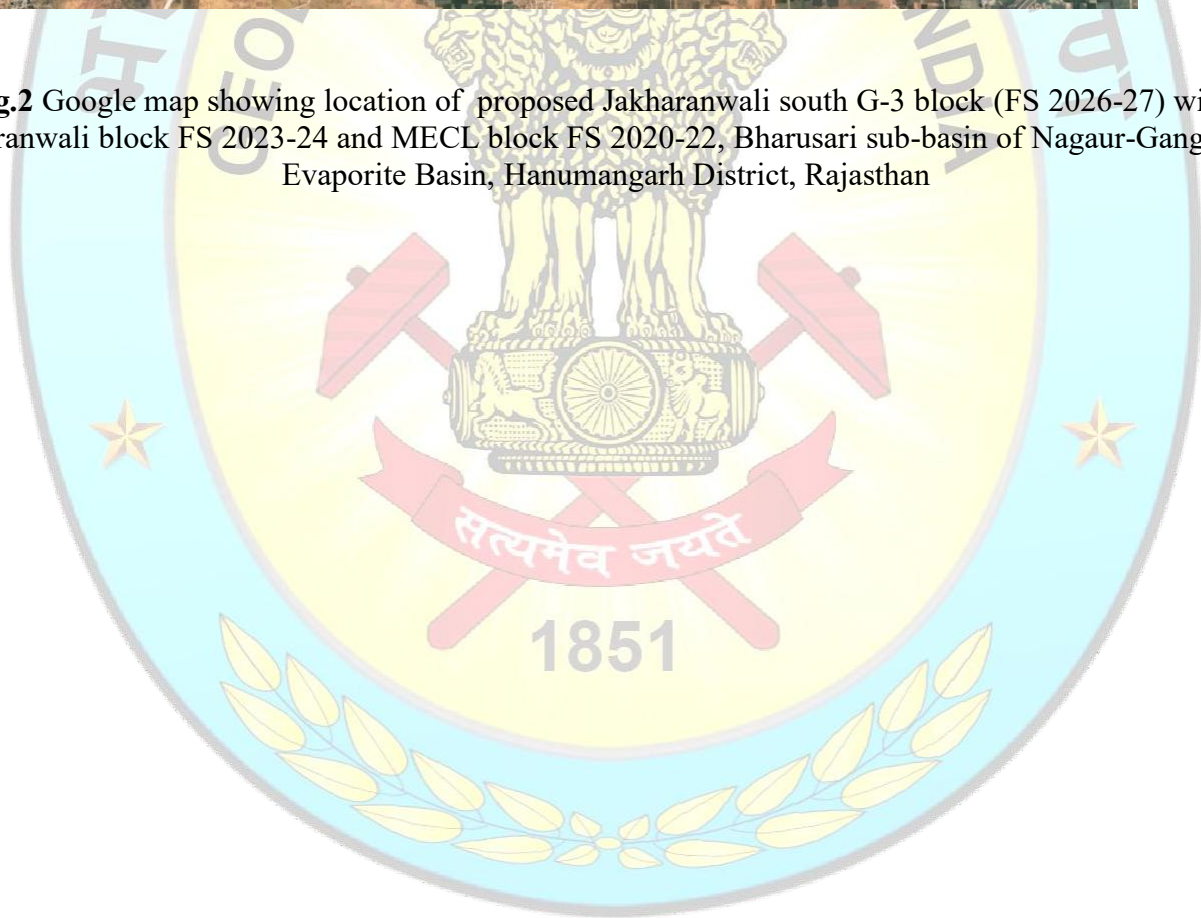


Fig.2 Google map showing location of proposed Jakharanwali south G-3 block (FS 2026-27) within Jakharanwali block FS 2023-24 and MECL block FS 2020-22, Bharusari sub-basin of Nagaur-Ganganagar Evaporite Basin, Hanumangarh District, Rajasthan



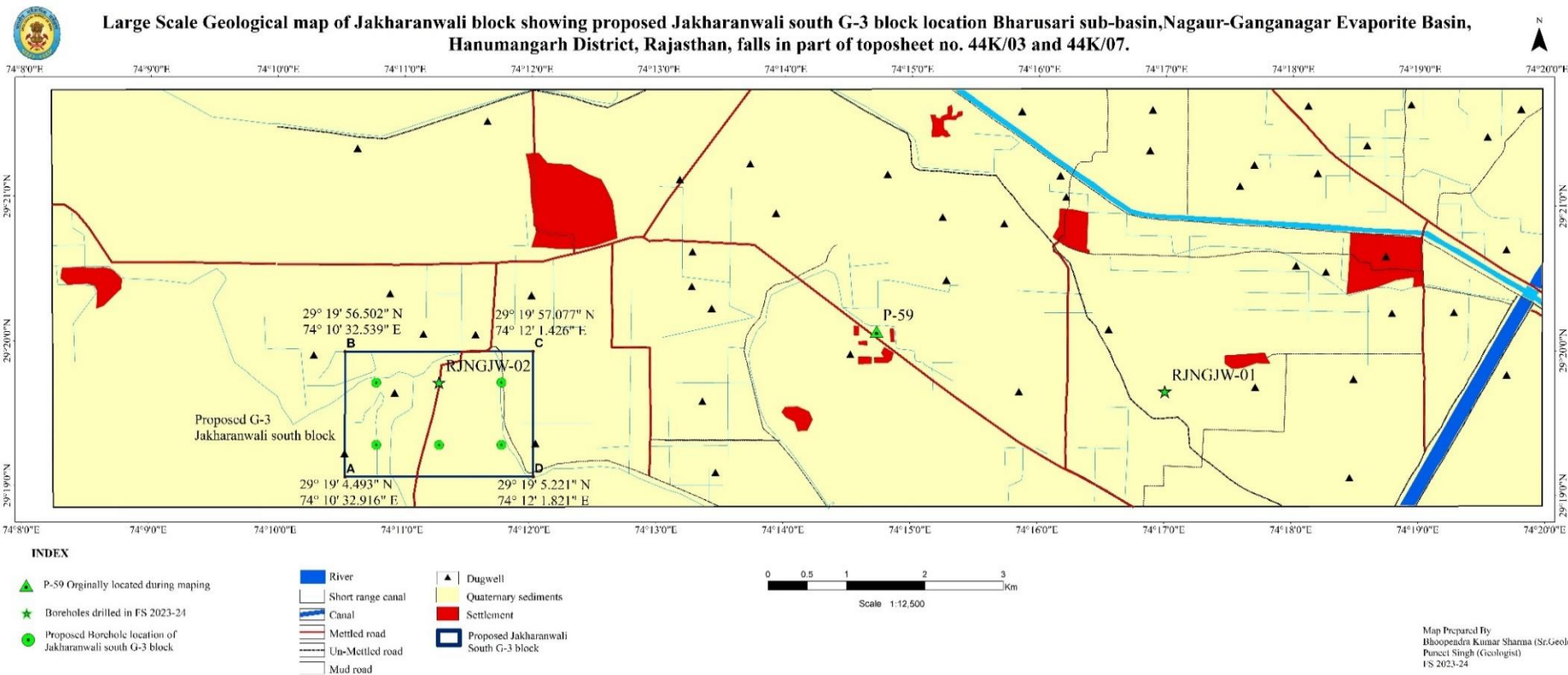


Fig.3 Proposed block with tentative borehole plan

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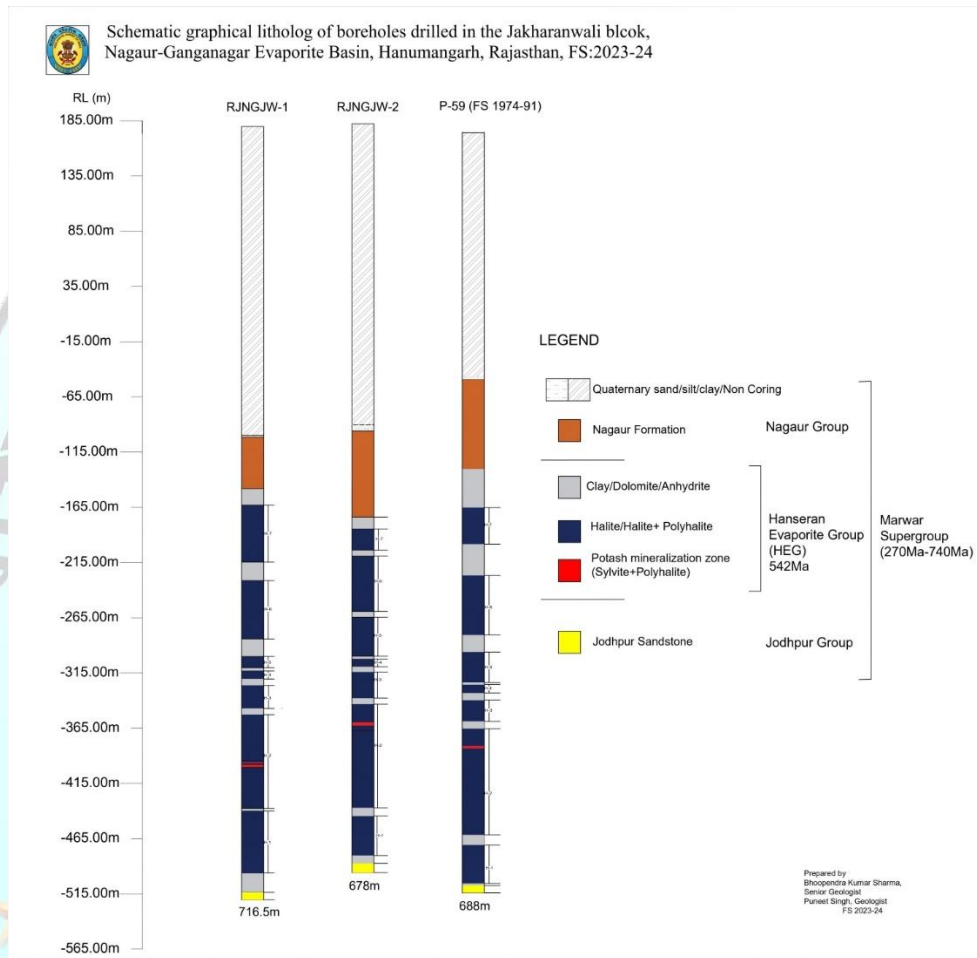


Fig.4 Schematic graphical litholog of the previous drilled boreholes

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