# RECONNAISSANCE SURVEY OF COPPER AND ASSOCIATED MINERALIZATION IN SALWARI-NARSINGHPURI-PACHLAGI AREA, SIKAR DISTRICT, RAJASTHAN.

**RECONNAISSANCE SURVEY (G-4 STAGE)**
**NMEDT FUNDED**

**COMMODITY:**

**BASEMETAL AND ASSOCIATED MINERALIZATION**

**BY**

**VARDAN ENVIRONET LLP**

**PLOT NO 82A, SECTOR-5 IMT MANESAR, GURGAON, HARYANA.**

**PLACE:-GURGAON**

**DATE:-01.02.26**

# CHAPTER-1 Block Summary
## General information about the block

### Table-1.1 Summary of the Block of Salwari and Surrounding Area, Sikar District, Rajasthan

| S. N. | Features | Details |
|---|---|---|
| | Block ID | VAR/NMET/ME/RJ/BM/SNP/2025/01 |
| | Exploration Agency | Vardan Environet LLP |
| | Commodity | Basemetal and Associated Mineralization |
| | Mineral Belt | Khetri Sub-basin (North Delhi Fold Belt) |
| | Completion Period with entire Time schedule to complete the project | 10 Months |
| | Objective | The present reconnaissance survey (G-4) is formulated based on the available regional geological data on the work carried out by GSI in and around the area; the program has the following objectives vis-à-vis proposed field components.<br><br>1) To carry out large scale geological mapping (LSM) on 1:12,500 scale of the block (Area: 24.01 Sq.km) to delineate various litho-units and their linear/planar structural features with special attention to identify potential host rocks of copper and associated mineralization.<br><br>2) To carry out systematic bed rocks sampling from the potential mineralized zones.<br><br>3) XRF, AAS and ICP-MS analysis of major and Trace elements of selected samples.<br><br>4) Petrographic and ore microscopic studies of possible host rock.<br><br>5) Pitting-trenching to know the continuity of host rock of selected zones and sampling.<br><br>6) To drill 6 inclined boreholes of 250 m (each) depth (total 1500 m) to prove the strike and depth persistence of ore bearing formation mapped in the area which in turn will decide the future course of Exploration program at G-3 category of UNFC.<br><br>7) Borehole Geophysical logging (natural gamma). |

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| | | 8) To assess G4 category (334) resource, in the block, as per UNFC norms and Minerals (Evidence of Mineral Contents) Rules. |
| | Whether the work will be carried out by the proposed agency or through outsourcing and details thereof. Components to be outsourced and name of the outsource agency | The large-scale geological mapping (1:12,500 scale), pitting, trenching, location of boreholes, core logging, sampling and report writing will be carried out by Vardan Environet LLP. However, the Vardan Environet LLP would outsource some of specialized works viz. Geophysical work, topographic survey and petrographic work will be outsourced.<br>• Chemical analysis and Petrological work will be out sourced as company has MOUs with Shiva analytic Lab, Bengaluru, SCS Enviro services, Jaipur, Radhey Testing Lab, Tundla and GSI chemical lab Western region, Jaipur, Rajasthan.<br>• Drilling work will be out sourced |
| | Name/ Number of Geoscientists | 9 (5 in house, 2 empanelled, 2 team member) |
| | Expected Field days (Geology)<br>Geological Party Days | Geologist: 100 field man days. |
| **1.** | **Location** | |
| | Latitude (N) | 27°39'00.89" |
| | Longitude (E) | 75°35'44.26" |
| | Localities | Salwari and Nearby area |
| | Tehsil/ Taluk | Khandela |
| | District | Sikar |
| | State/UT | Rajasthan |
| **2.** | **Area (hectares/ square km)** | |
| | Block Area | 24.01 sq. km |
| | Forest Area | About 1.52 $km^2$ (or 152 ha) area covers Salwari Protected Forest |
| | Government Land Area | Not Specified |
| | Private Land Area | Not Specified |
| **3.** | **Accessibility** | |
| | Nearest Rail Head | Khachera, Sri Madhopur, Sikar |
| | Road | NH-52, NH-48 (Jaipur-Sikar Highway) |
| | Airport | Sanganer Airport |

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| **4.** | **Hydrography** | |
| | Local Surface Drainage Pattern | Dendritic |
| | Rivers/ Streams | Kantli (ephemeral river) drains the proposed block |
| **5.** | **Climate** | |
| | Mean Annual Rainfall | 600-900 mm |
| | Temperatures | 32°C to 45°C in Summer 10°C to 25°C in Winter |
| **6.** | **Topography** | |
| | Toposheet Number | 45M/10 |
| | Morphology of the Area | Residual Aravalli hills |
| **7.** | **Availability of baseline geoscience data** | |
| | Geological Map (1:50K/25K) | Included |
| | Geochemical Map | Included |
| | Geophysical Map (Aeromagnetic, ground geophysical, Regional/local scale GP maps) | Included |
| 8. | Justification for taking up reconnaissance survey / Regional Exploration | **Background Information:** The upcoming G-4 level exploration program focuses on an area within parts of toposheet no-45 M/10, which lies within the Alwar and Ajabgarh Groups of the Delhi Supergroup (Heron, 1922). The Khetri belt, well-known for copper deposits, has been extensively studied, particularly in its northern regions where copper mineralization is concentrated. While no significant copper deposits have been identified in the southern part of the Khetri belt, recent surveys have indicated that this area holds promise for base metals, particularly copper, as well as molybdenum and uranium.<br><br>S.K.Ray (1987) carried out extensive studies on Albitite zone in Ghateshwar area (West of Khandela) and reported molybdenum from the Ghateshwar area. The Geological Survey of India (GSI, 2016) carried out Large Scale Geological Mapping (LSM) in the Chala-Salwari-Narsinghpuri-Pachlagi region and recommended detailed work in parts of Salwari and Narsinghpuri area, where |

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| | | intensive drilling has been done by Atomic Minerals Directorate. Exploration by the Atomic Mineral Directorate (AMD) has revealed the presence of uranium mineralization along the albitite line, with surface indications of mineralization in the form of malachite and azurite stains, chalcopyrite and pyrite veins, and intense ferruginization within brecciated quartz hornblendite. The GSI's work has shown that copper, molybdenum and various sulfide minerals, including pyrite, chalcopyrite, pyrrhotite, and molybdenite, are hosted within calc-silicate rocks, garnet biotite schist, and albitite. In the Narsinghpuri area (Harman GSI, 2015-16), mineralization has been found in the form of disseminations, fracture fillings, and vein fillings, particularly in quartz-carbonate and amphibole-rich veins.<br><br>Furthermore, significant mineral exploration efforts have identified several zones of interest, including sulphide zones in borehole drill cores, which show concentrations of copper and molybdenum. Geophysical surveys, including airborne electromagnetic (AEM) and magnetic surveys have also highlighted conductive anomalies and magnetic zones, further indicating the area's potential for base metal mineralization. The Salwari region, known for fluorite mining, has also revealed copper mineralization associated with hornblendite and pyroxinite rocks.<br><br>GSI's follow-up exploration in the Chaukri-Bamnara block (GSI, FS 2019-20) has further revealed evidence of copper mineralization in the form of malachite stains associated with calcite-fluorite veins and magnetite-ilmenite. The area's hydrothermal nature of mineralization, with fluorite, calcite, and magnetite-ilmenite, presents a favorable environment for base metal deposits. Two channels laid in the northern part of the block with 3 m and 5 m. zones with Cu values ranging from 440 ppm to 0.36% Cu. Further the ground geophysical studies carried out in Salwari block also recommended two boreholes based on intersection of different anomalies, but all these anomalies were left untested by drilling.<br><br>The area also presents opportunities for further detailed geochemical and geophysical investigations, (Harman, GSI, FS 2015-16) recommended detailed Geophysical |

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| | | studies in the Northeastern part of the area, i.e., NE of Narsinghpuri area) especially in the northeastern regions where albitite occurrences are more intense. The comprehensive geological, geophysical, and geochemical data collected so far suggests the potential for significant mineralization, ***warranting reconnaissance Survey by drilling exploration efforts***. With the above data, the area needs a reconnaissance Survey of base metals, molybdenum, and REE mineralization with G-4 level prospecting and scout drilling to establish the mineralization.<br><br>**Justification:-**<br>1. The area proposed area forms part of the south Khetri belt, where Uranium mineralisation is already being mined in Rohil area by UCIL, this deposit has 1500 ppm average Cu associated.<br><br>2. Geological survey of India (FS 2015-16) carried out LSM in part of the area which is proposed for G-4 exploration, five samples recorded values of copper ranging from 0.36% to 3.45% besides molybdenum ranging up to 201.11 ppm and TREE 0.5% in one sample.<br><br>3. Geophysical anomalies ranging from 1 km to 1.5 km in strike length in IP chargeability, supported by Magnetic recorded in Ground geophysics by GSI (2016), in North East of Narsinghpuri area.<br><br>4. GSI (2016) also recommended 2 boreholes based on Geophysics in Salwari area.<br><br>5. Heliborn survey by AMD indicated conductive zone in the same area.<br><br>6. Several boreholes drilled by AMD and borehole core studied by GSI (FS 2015-16) recorded occurrence of sulphide zone at multiple levels, containing pyrite, pyrrhotite, covellite and chalcopyrite.<br><br>7. Just center of the proposed block, GSI (FS 2015-16) carried out DM in the Block Chokari Bamnara area recorded copper values up to from 440 PPM to 0.36% in 2 channels in the northern part of the DM block. Besides moderate values of TREE. |

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| | | 8. Fieldwork carried out by Vardan Environet LLP team in the area (Nov, 2024 & July, 2025), recorded presence of brecciation, malachite staining, shearing, presence of albitization of Ajabgargh lithologies, hornblendite with magnetite bearing albitite with malachite staining, silicification, calcite and fluorite veins are strong indications of mineralisation in the area. And during July-2025, Vardan Environet LLP team carried out field work for planning of 6 boreholes.<br><br>9. Out of four Samples collected by Vardan Environet LLP team (Nov, 2024) from the area one Sample indicated encouraging value of 2930 ppm of Cu and high Vanadium (2588 ppm) and high $TiO_2$ 27.03% Supports the field evidences indicating sulphide mineralisation.<br><br>**Hence, A G-4 Stage exploration i.e. reconnaissance survey of the area for multiple mineralization is a justified proposal.** |

## 1.1 PHYSIOGRAPHY

Sikar district is located in the northeastern part of Rajasthan, India, and covers an area of 7,732 $km^2$. It shares its borders with Jhunjhunu district to the north, Haryana to the east, Jaipur district to the southeast, Nagaur district to the southwest, and Churu district to the west. Geographically, the district spans between 27°07 01.57" to 28°12'12.56" north latitude and 74°40'48.23'' to 76°05'47.66'' east longitude, and is mapped under the Survey of India degree sheet numbers 45I, 45M, 54A, 44P, and 44L.

### 1.1.1 Topography and Physiography

Sikar's topography is diverse, combining sandy plains, hilly areas, and semi-desert terrain. The western half of the district, being part of the Outside Basin, lacks a systematic drainage system, which contributes to its desert-like conditions. This region is marked by sandy plains with dunes, particularly in the north, around Ramgarh, where the land transitions into a semi-desert. On the other hand, the eastern half of the district is dominated by the Aravalli Mountain range, which stretches from south to north and divides the district almost into two halves. The Malkhet hills in the east are home to the highest peak in the district, which rises to 1,052 m above sea level in the Sikar tehsil. Overall, the general elevation of the district varies between

375 - 500 m above sea level, with the highest peak in the northern part reaching 1,032 m in the Piprali block. The district's terrain is divided into two distinct physiographic regions:

**Sandy Plains:** These occupy the western part of the district, which is part of the western desertic plain and exhibits a desert-like topography. This region is mainly flat with scattered dunes.

**Hill Ranges:** The eastern half of the district is characterized by NE-SW trending hill ranges, which include the Aravalli hills and other minor hills in the region. These hills are generally lower in elevation, with peaks ranging from 350 m to 700 m, and they provide a stark contrast to the flat desert terrain in the west.

The central region of the district is a watershed area, where rivers and streams flow in different directions: those in the north flow towards the north, those in the south towards the south, and those in the east towards the east.

**Figure-1.1 Location map of the proposed block**
**(Source: GWD, Rajasthan, 2013)**

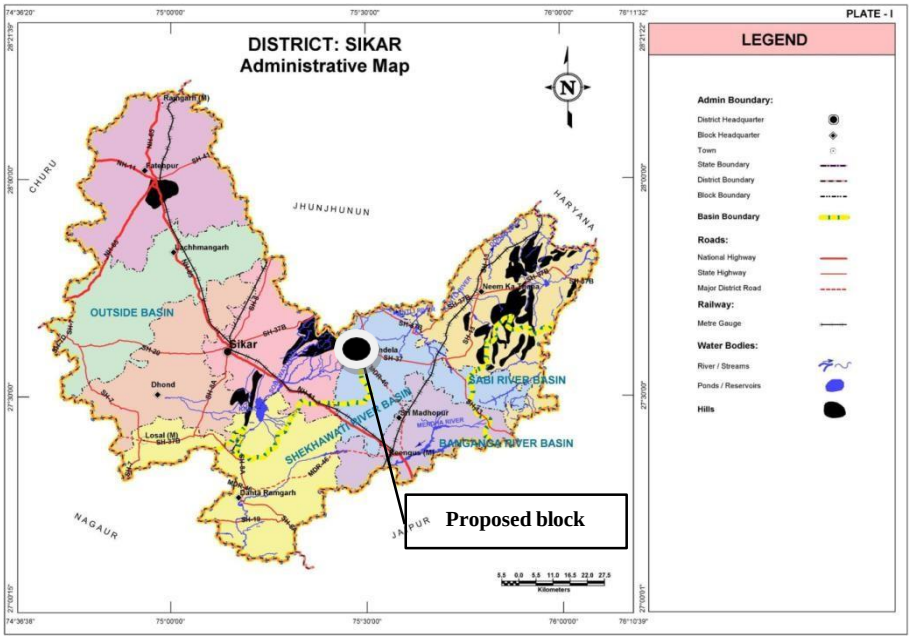
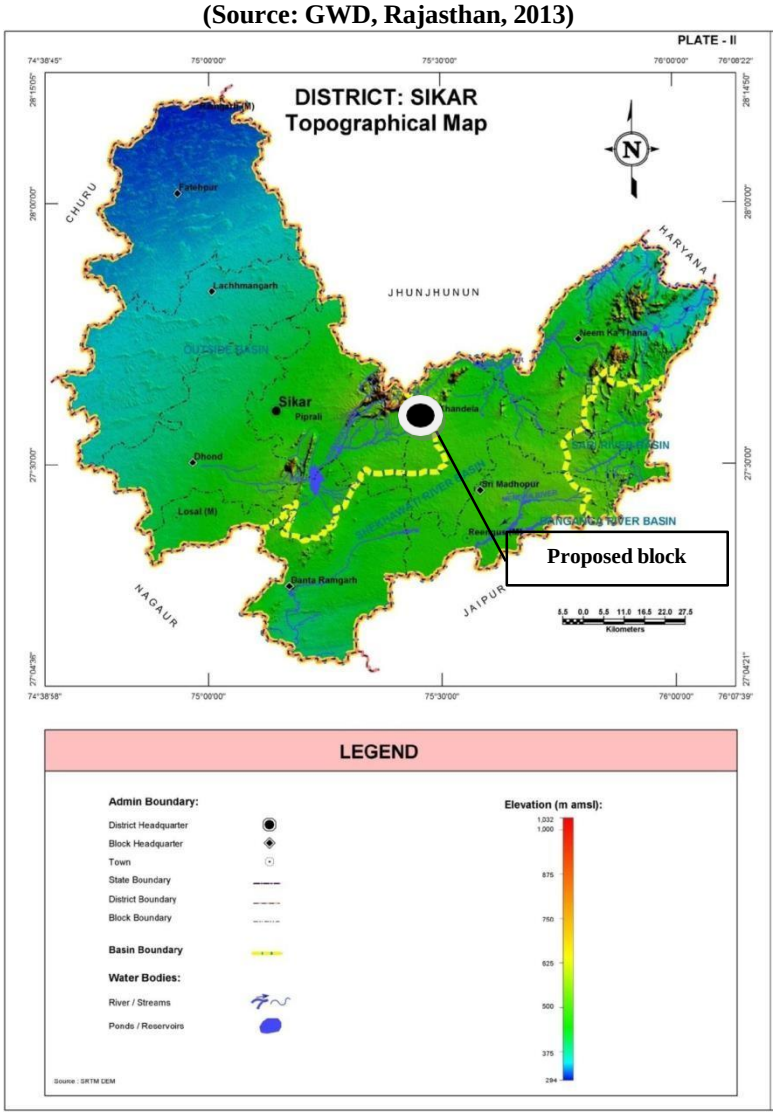


**Figure-1.2. Topographic map of district Sikar**
**(Source: GWD, Rajasthan, 2013)**




## 1.1.2 Rivers and Drainage

The district is mostly dry, with no perennial rivers. However, there are several seasonal rivers and streams that contribute to its water flow. The main rivers in the district include Mendha, Kantli, Dohan, Krishnawati, and Sabi. These rivers flow primarily during the monsoon season and are important for the region's water supply. The Mendha River flows through the Danta Ramgarh and Sri Madhopur tehsils and eventually merges with the Sambhar Lake, while the Kantli River originates near Khandela in Sri Madhopur tehsil and flows northeast ward out of the district into Jhunjhunu district. The Dohan River flows in the northeastern part of the district, covering a small area, while the Krishnawati River originates in the Neem Ka Thana hills and flows out of the district in a northeastern direction. The Sabi River flows mainly within the Neem Ka Thana tehsil.

The western half of the district, being part of the Outside Basin, lacks a proper drainage system, resulting in limited surface water flow in that region. Minor streams or nallahs, originating from the hills, flow short distances and often disappear into the sandy plains. However, the eastern region is better drained, with the Shekhawati River draining the central part of the district and the Sabi River draining a small area in the east.

### 1.1.3 Soils

Sikar district exhibits a variety of soil types, which contribute to the region's agricultural potential. The major soil types in the district are:

**Desertic Soil:** Found predominantly in the western sandy regions, this soil is dry, infertile, and often sandy.

**Red Desertic Soil:** A variant of desertic soil, rich in iron oxide, found mostly in the desertic areas.

**Serozems:** Soils found in arid regions, which are typically alkaline and have a hard crust on the surface.

**Saline Soil:** These soils have high salt content, found mainly in the more arid, dry areas, often in the western part of the district.

**Lithosols:** Shallow soils found in hilly areas, formed from rock weathering, and typically less fertile.

**Regosols:** Soils formed from recent deposits, often sandy or loose, found in both the sandy plains and hilly regions.

**Old Alluvium:** These soils are older alluvial deposits, commonly found in riverbeds or floodplains, typically rich in nutrients and more suitable for farming.

### 1.1.4 Groundwater and Hydrology

Groundwater in Sikar is primarily controlled by the district's topographic features, geological conditions, and physical characteristics. The groundwater is typically found under unconfined to semi-confined conditions. The Quaternary sediments, which form the principal aquifer, cover most of the district, particularly the western and central parts. These sediments are important for groundwater storage, as they contain sufficient water-bearing capacity. In addition, certain areas in the eastern and north-central parts of the district are underlain by

quartzite, schist, phyllite, limestone, and dolomitic limestone of the Delhi Super Group, which also serve as important groundwater aquifers. The availability of groundwater in Sikar is vital, given the lack of perennial surface water sources. Despite the presence of minor rivers and streams, the district's reliance on groundwater for irrigation and drinking water is significant.

### 1.1.5 Climate and Rainfall

Sikar district is primarily part of a semi-arid region and experiences a climate typical of such areas—hot summers, a fairly good monsoon season, and chilly winters. The climate is characterized by low humidity throughout most of the year, with the air remaining dry except during the monsoon season, when humidity levels can rise up to 60%.

***Temperature and Seasons***

Summer (March to June): During the summer months, temperatures can soar, often reaching a maximum of 47°C to 48°C. The region experiences intense heat during these months, which can be challenging for both the local population and agriculture.

Winter (November to February): In contrast to the hot summer, the winter months in Sikar are quite chilly, with cold nights where temperatures can drop to around 1°C. Days are relatively mild, with average temperatures hovering around 16°C to 20°C throughout the year.

Annual Average Temperature: The overall average temperature across the year ranges from 16°C to 20°C, providing a relatively moderate climate despite the extremes in summer and winter.

***Rainfall***

Sikar district generally receives scanty rainfall, typical of semi-arid regions. The average annual rainfall is approximately 363.7 mm. The majority of this rainfall occurs during the southwest monsoon season, from July to September. Although the rainfall is generally low, the district does experience periods of higher precipitation, particularly during favourable monsoon years.

In 2010, the district experienced unusually high rainfall, with most of the area receiving 600-900 mm. The distribution of rainfall that year showed a clear gradient, with the eastern part of the district receiving the highest rainfall, while the western parts saw much lower amounts.

**Annual Average Rainfall (Overall):** 797.8 mm, based on available block data.

**Block-level Rainfall Variation**: The Neem Ka Thana block, located in the northeastern part of the district, recorded the highest rainfall in the year, with a total of 1,225.3 mm. In contrast, the Danta Ramgarh block in the southernmost part of the district received the least rainfall, at 552.7 mm.

**Rainfall Distribution:**

Rainfall in Sikar varies considerably from the eastern to the western parts of the district. The eastern areas, including blocks like Neem Ka Thana, receive the most rainfall due to their proximity to the Aravalli hills.

The rainfall gradually reduces as we move westward towards the desertic plains, with the lowest rainfall observed in the southwestern and northwestern parts of the district. This creates a clear gradient in rainfall distribution, from high in the east to low in the west.

## 1.2 BACKGROUND GEOLOGY

## 1.2.1 REGIONAL GEOLOGY

The North Delhi Fold Belt (NDFB) is a geologically complex region in Rajasthan, India, composed of several basins, including the Bayana-Lalsot, Alwar-Jaipur, and Khetri basins. These basins are situated within the Delhi Supergroup, a sequence of sedimentary and volcanic rocks. However, the Khetri Basin (also called the Khetri Fold Belt - KFB), which hosts important copper deposits, is regarded as a distinct geological entity by certain researchers (Gupta et. al., 1998), due to its unique lithostratigraphy, magmatism, and structural characteristics.

**Bayana-Lalsot Basin**

The Bayana-Lalsot basin is located in the Bharatpur and Dausa districts, roughly 40 km southwest of Bharatpur. It is considered the easternmost part of the Delhi Supergroup. The sedimentary deposits in this basin were formed in fluvial and marginal marine environments, with volcanic rocks that show a continental affinity. The major stratigraphic units in this basin include:

- Lower Raialo Group: Primarily calcareous.
- Middle Alwar Group: Mainly arenaceous (sandy).
- Upper Ajabgarh Group: Mainly argillaceous (clayey).

These groups do not develop uniformly throughout the basin, with variations in lithological facies and occasional absence of certain formations.

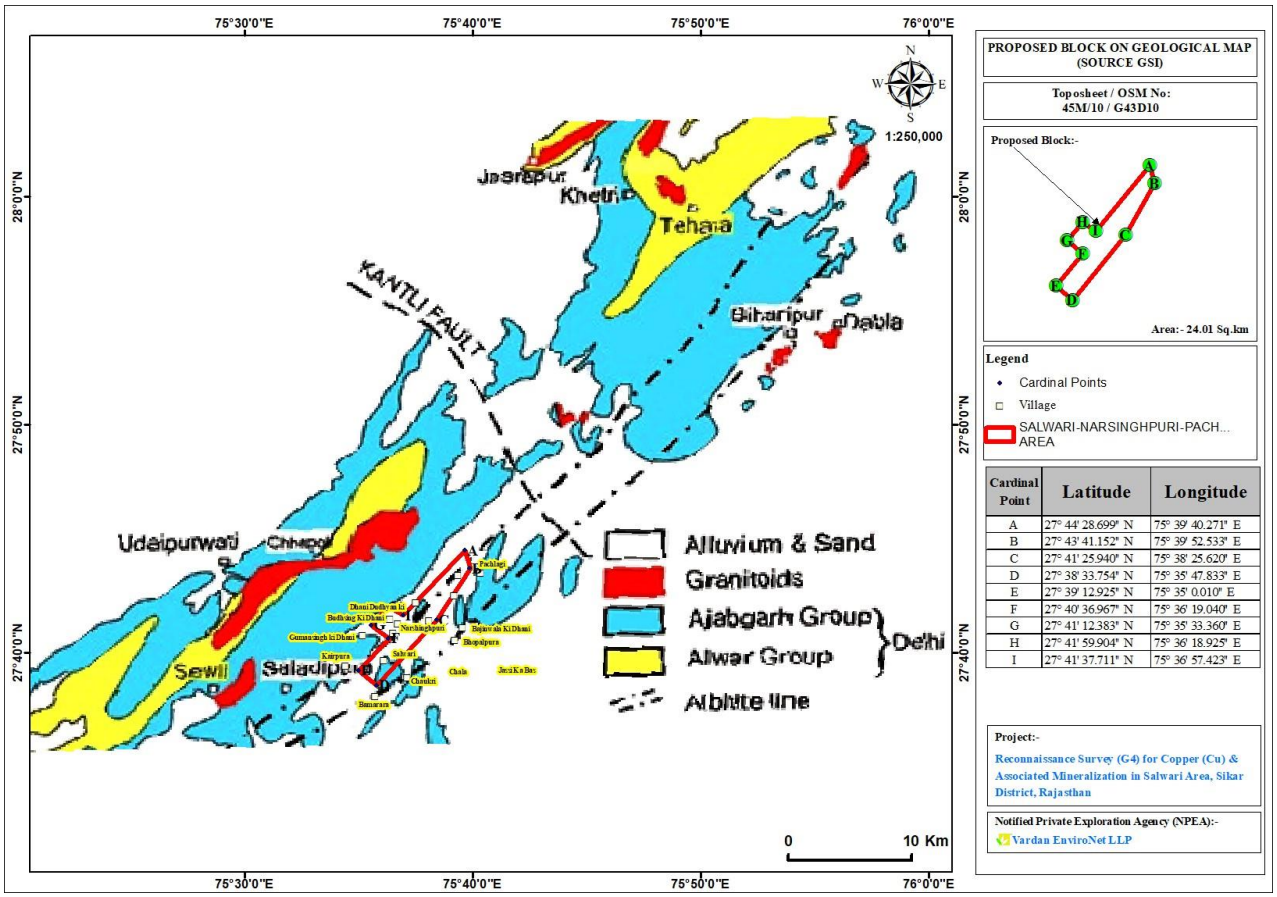
**Alwar-Jaipur Basin**

This basin stretches from Jaipur in the south to the Rajasthan-Haryana border in the north, lying between the Bayana-Lalsot basin to the east and the Khetri basin to the west. It is the widest of the three basins and shares similar environmental conditions for sedimentation. The stratigraphy is similar to that of the Bayana-Lalsot basin, consisting of the Raialo, Alwar, and Ajabgarh groups, although like the Bayana-Lalsot basin, it does not show a complete or continuous stratigraphy.

**Khetri Basin (Khetri Fold Belt)**

The Khetri Basin, also known as the Khetri Copper Belt, is a significant geological region located in northern India, extending approximately 100 km from Pacheri in the north to Sangrua in the south. The basin is renowned for its copper deposits, notably near the town of Khetri.

**Figure-1.3. Proposed block on Geological map (LSM)**




| Cardinal Point | Latitude | Longitude |
|---|---|---|
| A | 27° 44' 28.699" N | 75° 39' 40.271" E |
| B | 27° 43' 41.152" N | 75° 39' 52.533" E |
| C | 27° 41' 25.940" N | 75° 38' 25.620" E |
| D | 27° 38' 33.754" N | 75° 35' 47.833" E |
| E | 27° 39' 12.925" N | 75° 35' 0.010" E |
| F | 27° 40' 36.967" N | 75° 36' 19.040" E |
| G | 27° 41' 12.383" N | 75° 35' 33.360" E |
| H | 27° 41' 59.904" N | 75° 36' 18.925" E |
| I | 27° 41' 37.711" N | 75° 36' 57.423" E |

The region is geologically complex and has been subject to various interpretations over time, especially regarding its stratigraphy and formation history.

## Geological Setting

**Borders:** The Khetri Basin is geologically bordered by the Delhi Supergroup in the Alwar-Jaipur Fold Belt to the east, while sand dunes dominate the western part of the basin.

**Structural Features:** The Khetri Fold Belt is a narrow, NE-SW trending zone, divided into the North Khetri Belt (NKB) and South Khetri Belt (SKB) by the NW-SE trending Kantli fault. This fold belt is part of the Proterozoic Delhi Supergroup and is thought to have developed during the Proterozoic era in a transpressional tectonic regime.

## Stratigraphy and Lithology

**Early Work:** Heron (1922) initially proposed a lithological correlation between the Khetri basin rocks and those of the Alwar and Ajabgarh sequences. He classified the Khetri rocks into three major groups: the Raialo, Alwar and Ajabgarh Series, based on lithological similarities. The Raialo Series was characterized by marble, the Alwar Series by psammitic rocks and the Ajabgarh Series by pelitic rocks. Heron's work was based primarily on lithology and observed gradational contacts between these series.

**Later Refinements:** Subsequent research, such as by Dasgupta (1968) and Gupta et. al. (1998), further refined the stratigraphic understanding. Chakrabarti & Gupta (1990) identified high-grade migmatized rocks in the southern part of the basin as unclassified pre-Delhi formations, linking them to the Manglwar Complex and the Basement Complex (BGC) south of Sambhar Lake.

## Key Lithologies

**North Khetri Belt (NKB):** The NKB is composed of quartzite (in various varieties), schist, and marble with minor calc-silicates. Numerous amphibolite dykes and a few granite batholiths are also present. This area includes the Chhapoli-Ponkh fold, described by Heron as an antiformal structure.

**South Khetri Belt (SKB):** The SKB comprises a variety of rock types, including psammitic, pelitic, and calcareous rocks. These belong to the Proterozoic Delhi Supergroup (Alwar and Ajabgarh groups) and have undergone regional metamorphism from green-schist facies to

amphibolite facies. The region is marked by anticlines and synclines, with granitoid plutons occupying the cores of antiformal structures.

**Tectonic and Structural Features**

**Faulting and Folding:** The Khetri Basin is characterized by significant structural complexity, including regional anticlines and synclines, such as the Chhapoli-Ponkh anticline. This anticline is flanked by smaller folds to the west and east. The basin's structural features reflect the tectonic activity during the Proterozoic, influenced by transpressional forces.

**Tectonic Boundaries:** Chakraborty and Gupta (1990) classified the SKB litho-sequence into three parts, separated by sharp tectonic boundaries. The westernmost part corresponds to the Delhi Supergroup, the central part belongs to the Raialo sequence (Pre-Delhi), and the eastern part is linked to the Mangalwar Complex.

**Metamorphism and Granite Intrusions**

**Metamorphism:** The rocks in the Khetri Basin have experienced varying degrees of metamorphism, from green-schist facies to amphibolite facies, particularly in the South Khetri Belt.

**Granite Intrusions:** Several granitoid plutons and basic rocks of different ages occur throughout the basin, contributing to the geological diversity. The Saladipura Granite Gneiss and Sewli Granite are important components of the basement and intrusive sequences, respectively.

**Recent Studies**

**Gupta et. al. (1998):** These studies further divided the meta-sedimentary sequence of the SKB into two main parts: the Proterozoic cover sequence (containing orthoquartzite, schist, felsic volcanic rocks, and carbonates) and a pelitic-carbonate dominated basement sequence. These are separated by the Chhapoli fault, trending ENE-WSW to NESW.

**Bahera and Khar (2004):** Their geological mapping in the eastern part of the Khetri Basin focused on albitisation, classifying the rocks into the Mangalwar Complex (Bhilwara Supergroup) and the Raialo Group.

**Table-1.2: Stratigraphic units of Sikar district as per Geological Survey of India.**

| Sr. No. | Lithology | Group | Super group | Age |
|---|---|---|---|---|
| 1. | Alluvium and blown sand | | | Quaternary |
| 2. | Quartz vein | | Intrusive | Upper Proterozoic |
| 3. | Gabbro | | | |
| 4. | Granite, Pegmatite | | | |
| 5. | Brecciate Quartzite, Phyllite | Ajabhgarh Group | Delhi Supergroup | Lower to middle Proterozoic |
| 6. | Impure marble, Amphibolite, Quartzite, carbon phyllite | | | |
| 7. | Massive quartzite, Schist | Alwar Group | | |
| 8. | schist | | | |
| 9. | Conglomerate, quartzite | | | |
| 10. | Carbonaceous schist | Shyampura Group | | |
| 11. | Dolomite | | | |
| 12. | Quartzite | | | |
| 13. | Staurolite-garnet - biotite Schist | | | |
| 14. | Quartzite | | | |
| 15. | Calc-silicate rock | Saladipura Group | | Archaean |
| 16. | Quartzite | | | |
| 17. | Mica Schist | | | |

**TABLE-1.3: Classification of Delhi Supergroup (Lower to Middle Proterozoic).**

| **South-western Rajasthan and North-eastern Gujarat** | | **Ajmer Sector** | | **North-eastern Rajasthan** | |
|---|---|---|---|---|---|
| PUNAGARH GROUP | Sojat Formation Bambholai Formation Khambal Formation Sowania Formation | SINDRETH GROUP | Angor Formation Goyali Formation | | |
| Sendra-Ambaji Granite and Gneiss | | | | | |
| Kishangarh Syenite | | | | | |
| Phulad Ophiolite Suite | | | | | |
| KUMBALGARH GROUP | Todgarh, Beawar, Kotra, Sendra, Ras, Barr, Basantgarh and Kalakot Formations | AJABGAR-H GROUP | Ajmer Formation | AJABGARH GROUP | Kushalgarh, Sariska, Thanagazi, Bhakrol and Arauli Formations |
| | | | | | |
| GOGUNDA GROUP | Richer, Antalia and Kelwara Formations | ALWAR GROUP | Srinagar and Naulakha Formations | ALWAR GROUP | Rajgarh, Kankwarhi, Pratapgarh, Nithar, Badalgarh and Bayana Formations |
| | | | | | |
| | | | | RAIALO GROUP | Dogeta and Tehla Formations |
| (modified after S.N. Gupta et.al.,1997) | | | | | |

## 1.2.2 GEOLOGY & PETROLOGY OF THE PROPOSED BLOCK

### 1.2.2.1 Basic Intrusions

The area is characterized by a significant presence of basic intrusions, primarily amphibolite and pyroxenite-hornblendite. These rocks are part of the region's metamorphic and igneous rock suite, and they are associated with tectonic and volcanic activity.

**Amphibolite:** This metamorphic rock is composed mainly of amphibole minerals, with a foliated or non-foliated texture. Amphibolites are observed in the quartzite and calc-silicate rocks of the Railo Group, particularly near Bhudoli. The amphibolite's formation is likely due to regional metamorphism, which has influenced the surrounding country rocks, including the quartzite.

**Pyroxenite-Hornblendite:** Pyroxenite is an ultramafic rock, composed predominantly of pyroxene minerals, while hornblendite contains hornblende. These rocks are found as small hillocks or mounds, particularly near Salwari, where they contain ilmenite ($FeTiO_3$) as an accessory mineral. These rocks are coarse to very coarse-grained, with large crystals of hornblende and pyroxene. However, due to retrograde metamorphism, these minerals often alter to actinolite, a form of amphibole mineral.

**Ilmenite-bearing Pyroxenite-Hornblendite:** These rocks, especially in Salwari, are rich in ilmenite, which is of economic interest due to its titanium content. Geochemical samples from the area show high values of $TiO_2$ (about 14%) from ilmenite, suggesting that it is an important mineral resource. The ilmenite is observed in two forms: massive, with octahedral cleavage, and lamellae, where lamellae are embedded within the massive form.

### 1.2.2.2 Acid Intrusions

The geological profile also includes acid intrusions, with rocks such as porphyritic granite, pegmatite, albitite, and quartz veins. These intrusions are significant because of their mineral content and the structural relationships they form with the surrounding rocks.

**Porphyritic Granite:** This granite is particularly noted for its pink color and porphyritic texture, which means that large crystals of feldspar (particularly pink feldspar) are embedded in a finer-grained matrix. Granite near Salidapura is described as pink, highly foliated, and porphyritic, while granite near Karoth Dhaniyan is grey, weakly foliated, and contains smaller feldspar phenocrysts.

**Pegmatite and Quartz Veins:** These are generally intrusive rocks, often containing large crystals of minerals like mica, feldspar, and quartz. At Bhudoli, pegmatite veins are actively mined for mica and feldspar, which are of commercial importance. Quartz veins are found across the region and often contain xenoliths (rock fragments) of pyroxenite and albitite, indicating complex geological interactions.

**Albitite:** This fine-grained, light-colored rock is composed predominantly of albite (a type of feldspar). Albitite intrusions are found throughout the region, often associated with pyroxenite-hornblendite. The rock shows a characteristic appearance due to the presence of aventurine feldspar and is often found in weakly foliated zones or along fractures and joints in the country rocks. Albitite is particularly abundant in the Salwari area and forms low mounds. It also hosts fluorite and calcite as accessory minerals.

### 1.2.2.3 Mineralization and Economic Resources

The region hosts several mineral deposits of economic significance, which are currently being mined or have potential for future extraction. These include:

**Ilmenite:** Found in the pyroxenite-hornblendite at Salwari, this mineral is an important source of titanium ($TiO_2$). Geochemical samples from the area show high values of $TiO_2$ (about 14%) from ilmenite, suggesting that it is an important mineral resource. The ilmenite is observed in two forms: massive, with octahedral cleavage, and lamellae, where lamellae are embedded within the massive form.

**Copper Ores:** At Salwari, there are occurrences of covellite and malachite, which are secondary copper minerals. These minerals form as a result of the alteration of primary copper ores, and their presence is indicative of past hydrothermal processes in the region.

**Fluorite:** Fluorite is commonly associated with pyroxenite-hornblendite, and quartz veins containing fluorite crystals can be seen in several locations, particularly in the cavities and vugs of these rocks. The fluorite varies in color, ranging from light green to violet, and forms in association with quartz crystals. This mineral is likely formed through hydrothermal processes, which have also contributed to the formation of quartz veins.

**Mica and Feldspar:** Pegmatite veins, particularly around Bhudoli, are mined for mica and feldspar, both of which have significant industrial uses, especially in the manufacture of ceramics and as an insulating material in electrical applications.

**Calcite:** Calcite veins are found in the calc-silicate rocks at Bagsingh Ki Dhani, where calcite is extracted for use in various industrial applications.

### 1.2.2.4 Tectonic and Structural Features

The area exhibits significant tectonic features, particularly the occurrence of breccia and faults. The breccia in the region contains fragments of pyroxenite-hornblendite and albitite, which suggests tectonic deformation during the emplacement of these rocks. This deformation may have been accompanied by shearing and silicification, as evidenced by the presence of numerous quartz veins.

**Silicification**: The widespread occurrence of quartz veins indicates that silicification has occurred in the region after the shearing process, leading to the formation of secondary quartz minerals. Some of these veins also contain tourmaline, which appears to have been emplaced synchronously with the quartz veins during tectonic activity.

### 1.2.2.5 Garnetiferous Schist and Metamorphic Rocks

Around the western part of the area, including near Salwari, Bagsingh Ki Dhani, and Kalsa Ki Dhani, there are exposures of garnetiferous biotite schist. This schist shows a well-developed schistosity, with minerals like hornblende, biotite, plagioclase, quartz, epidote, and calcite. Sulphide mineralization, such as pyrite and spinel, is also observed in these schists, particularly near Babai, indicating some level of mineralization related to metamorphic processes.

### 1.2.2.6 Geochemical Alterations and Secondary Processes

The region shows clear signs of retrograde metamorphism, with primary minerals such as hornblende and pyroxene altering to actinolite and tremolite. These alterations are often observed in hand specimens and thin sections. The alteration of amphibole to chlorite along cleavage traces is also noted in some slides, suggesting that hydrothermal fluids may have played a significant role in the secondary mineralization processes.

The alteration of ilmenite to anatase (a titanium dioxide mineral) is another example of secondary mineral formation. Anatase is observed to have a characteristic euhedral (well-formed crystal) shape, and its formation is linked to hydrothermal processes in the region.

### 1.2.2.7 Albitite Zones and Their Geological Significance

Albitite occurrences are extensive in the region, particularly in a zone trending NE-SW across the area, from Salwari to Neem ka Thana and beyond. These bodies are part of the larger Albitite Line that extends through northeastern Rajasthan, forming an important geological feature across the region. The albitite zones are associated with the feldspathization and fenitization of the surrounding rocks, which has been extensively studied and mapped by various researchers.

## 1.3 MINERAL POTENTIALITY OF THE BLOCK

**Salwari Area (Southern Part)**

Ultramafic rocks associated with quartz-magnetite-albitite are observed in the southern part of the mapped area, which indicates favourable surface indications for copper mineralization. The chemical analysis reveals an encouraging copper anomaly, and ground geophysical surveys show a significant conductive anomaly. Based on these findings, the area appears promising for base metal mineralization. Therefore, it is recommended to carry out further detailed investigations and systematic geochemical studies in this region.

**Western Narsinghpuri Area**

The western part of the Narsinghpuri area is mostly covered by alluvium, with the underlying lithology consisting of garnet-biotite schist associated with albitite and quartz-carbonate veins, which contain fresh sulphides as observed from well section samples. These samples show encouraging copper values and rare earth elements (REE), with one well section sample containing 0.36% Cu and 0.52% total REE. The widespread occurrence of albitite and the presence of sulphides suggest significant potential for mineralization in this area.

**Drilling in Narsinghpuri to Guman Singh Ki Dhani Area**

Extensive drilling activities have been ongoing in the westernmost part of the study area, from Narsinghpuri to Guman Singh Ki Dhani, targeting the so-called albitite line, based on ground geophysical and airborne surveys conducted by the Atomic Mineral Directorate for radioactive minerals. Borehole core studies have revealed significant concentrations of copper and molybdenum mineralization. Therefore, it is recommended to conduct scout drilling based on the geophysical data to explore base metal mineralization in the adjacent areas.

**North eastern Area (Pachlagi and Papra)**

Profuse occurrences of albitite are observed across various lithologies in the area, with particularly intense concentrations at the contact between calc-silicate and quartzite near Pachlagi and Papra. Given the prominence of these occurrences, ground geophysical mapping is recommended to further investigate the potential mineralization in this region.

## 1.4 SCOPE OF THE PRESENT EXPLORATION

**Phase I (Approximately 4 to 5 months)**

For the total block area, fertility assessment will be performed by geological mapping (1:12,500 scale) and identification of host rock and surface evidence of mineralisation. This will lead to an area reduction. After reducing the area of exploration geophysical survey (ground magnetic and resistivity survey) will be to identify anomalous mineralised targets. Also, this phase will consist of 750 m core

drilling in 3 boreholes and thereafter the chemical and petrographic analysis of the core samples.

**Phase II (Approximately 4 to 5 months)**

This phase will consist of 750 m core drilling in 3 boreholes and thereafter the chemical and petrographic analysis of the core samples. Core drilling will help to identify and characterise potential mineralized zones/ore bodies.

**Decision points**

The exploration strategy incorporates the GO-NO-GO milestones to be collaboratively decided between the Vardan Environet LLP, State of Rajasthan and the NMEDT based on the results of the on-going phases. Total duration of the work plan is 10 months. The exploration plan incorporates one decision point is after 5th month.

# CHAPTER-2

## 2.0 PREVIOUS WORK

The work described pertains to the geological exploration activities in the South Khetri Belt, specifically in the Chaukri-Bamnara block, located south of the well-known North Khetri belt, which is rich in copper mineralization. While the copper deposits in the North Khetri belt are extensively documented, the southern portion of the belt had not been similarly explored until recent studies. This region has been the focus of detailed exploration work by various organizations, including the Geological Survey of India (GSI) and the Atomic Minerals Directorate (AMD). These organizations have been involved in exploring base metals, molybdenum, and uranium in the area, conducting geological surveys, sampling, and drilling to assess the mineral potential.

### Geological Background

The South Khetri Belt has traditionally been seen as less promising for copper mineralization compared to the north. However, recent exploration has shown significant mineral potential in the southern region, with a variety of mineral deposits observed, including copper, molybdenum, and uranium. The GSI has been particularly focused on exploring for base metals and molybdenum, while the AMD has been investigating uranium mineralization along the albitite line, an area of geologically significant interest. The area has also been subjected to intensive geological surveys, which have identified several mineral occurrences, especially along structural discontinuities where mineralization is often concentrated.

### Surface Mineralization Indicators

Surface indicators of mineralization are abundant in the South Khetri Belt, particularly in the Chaukri-Bamnara block. These include the presence of malachite and azurite stains associated with hornblendite, pyroxinite, and other lithologies. Malachite and azurite are copper minerals, indicating the potential presence of copper ore bodies below the surface. Other mineralization features include chalcopyrite and pyrite found in quartz veins and calc-silicate rocks, as well as magnetite-albitite breccia. These minerals often appear as disseminations, vein fillings, and fracture

fillings. The occurrence of magnetite and ilmenite, both magnetic minerals, further supports the likelihood of significant mineralization in the region, as these minerals often indicate hydrothermal activity associated with ore deposition.

**Exploration Results in the Chaukri-Bamnara Block**

In the Chaukri-Bamnara block, substantial evidence of copper mineralization has been observed. The mineralization here is associated with malachite stains found along fracture planes and cleavages of hornblendite, albitite, and quartz veins. The presence of fluorite and calcite veins further indicates the hydrothermal nature of the mineralization. The mineralized zones are narrow, often less than 2 meters wide, but significant copper values have been recorded, ranging from 50 ppm to 0.36% Cu. Channel samples collected from two channels (RJCB/CH-01 and RJCB/CH-02) show copper values of 0.29% to 0.36% Cu, with the mineralized zones being confined to narrow veins. This suggests that while the mineralization is present, its width and continuity may be limited in some areas. However, the association with calcite-fluorite veins and magnetite-ilmenite further supports the presence of a potentially hydrothermal copper system in the region.

**Analytical Results**

The geochemical analysis of bedrock samples, including both grab samples and channel samples, indicates a wide range of copper values. Copper concentrations range from very low values of 10 ppm to more significant values of 3.45% Cu, with a few samples reaching values as high as 3.45%. Five of the samples, particularly those collected from hornblendite associated with malachite and fresh sulphides, exhibit particularly high copper values, ranging from 0.36% to 3.45% Cu. These samples, sourced from Salwari, a location in the region, have an average copper value of 1.5%. Other samples, particularly those collected from albitite-associated carbonate veins, have copper concentrations ranging from 0.16% to 0.87% Cu, with an average value of 0.46%. The analysis also showed significant values for rare earth elements (REEs), with total REE values ranging from 7.89 ppm to 722.56 ppm and an average value of 189.28 ppm. Additionally, fluoride concentrations in the samples range from 232 ppm to 3744 ppm, with an average value of 1997.73 ppm. These results suggest that the region may have a variety of economically important minerals, including rare earth elements and fluoride, in addition to base metals like copper.

## Drilling and Borehole Data

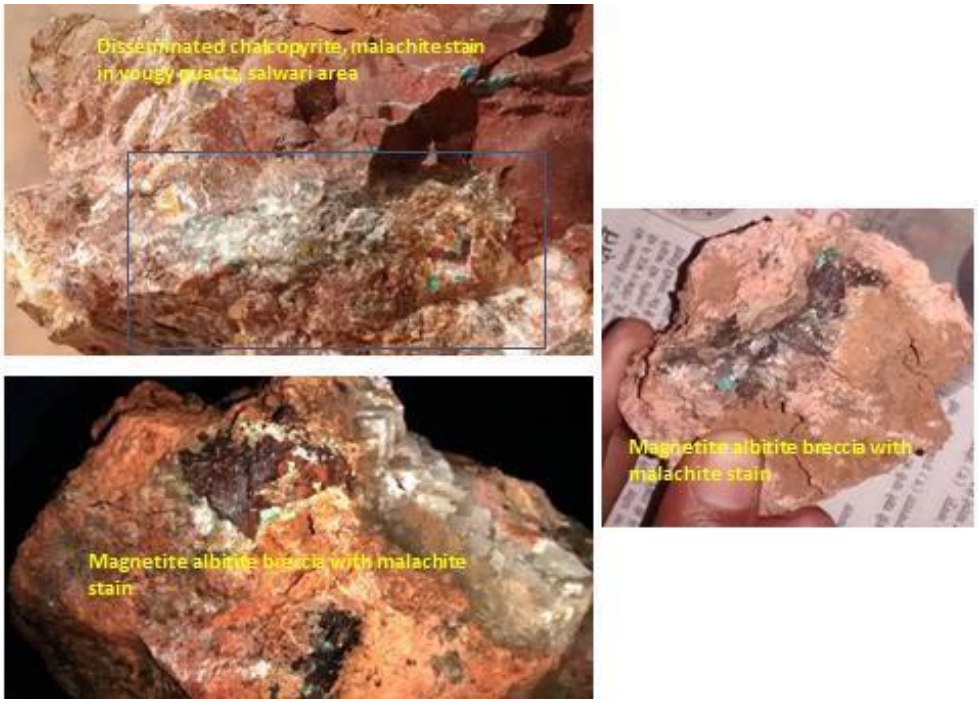
In the Narsingpuri area, the AMD has carried out extensive drilling to explore uranium mineralization. The borehole data from this region indicate three distinct zones of sulphide mineralization. The sulphides in these zones include pyrite, pyrrhotite, chalcopyrite and molybdenite are hosted within calc-silicate, garnet biotite schist and amphibole marble. The first sulphide zone occurs at a shallow depth of 45 m, the second between 170 m to 190 m, and the third at a deeper level (+220 m). These sulphide mineralization zones are typically found as vein fillings, fracture fillings, and disseminations within the host rocks. In some cases, molybdenite is found associated with massive sulphide veins, especially in amphibole-rich rocks. The mineralization here is predominantly hosted in calc-silicate and garnet biotite schist, which are common lithologies in the region.

**TABLE-2.1: Sulphides zone details (within BH)**

| Sulphides zones details | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Shallow Intersection | | | | Deeper Intersection | | | | | | | |
| BH No. | NRP-69 | | NRP-74 | | NRP-59 | | NRP-64 | | NRP-68 | | NRP-71 | |
| Depth of Intersection (m.) | 38.00 | 43.00 | 36.00 | 58.75 | 158.00 | 167.00 | 260.00 | 266.00 | 113.50 | 119.00 | 183.50 | 188.00 |
| | 50.00 | 56.00 | | | 179.00 | 182.00 | | | 176.00 | 177.30 | 204.00 | 207.00 |
| | 59.00 | 63.00 | | | 212.00 | 215.00 | | | 221.00 | 227.00 | 212.00 | 218.00 |
| | 72.00 | 75.50 | | | 223.00 | 236.00 | | | 264.00 | 269.00 | | |
| | | | | | 258.00 | 264.00 | | | | | | |

**Photoplate-1. Photograph of cores from Narsinghpuri area showing different lithounits and nature of sulphide mineralisation**

**Photoplate-2. Photograph of samples from Salwari area showing disseminated chalcopyrite, malachite stain in vougy quartz and magnetite albitite breccia with malachite stain**




**Photoplate-3. Photograph of core samples from Narsinghpuri area showing different lithounits and nature of sulphide mineralisation**

The borehole data has revealed significant concentrations of base metals. For example, the average copper content in the Rohil Uranium deposit is 1500 ppm, while the molybdenum content is around 350 ppm. Additionally, the total sulphide content (TMC) in these deposits is higher than typical deposits, ranging from 4 to 5%. This high sulphide content further supports the potential for significant base metal mineralization in the region, especially in association with uranium mineralization.

**Geophysical and Aerogeophysical Surveys**

The South Khetri Belt, particularly the Narsingpuri area, has also been subject to extensive geophysical exploration, including aeromagnetic and aerogeophysical surveys. The surveys have identified several strong conductive zones that suggest the presence of sulphide mineralization. These zones were detected in aeromagnetic maps showing anomalies with values of 8250 nT to 9200 nT, indicating magnetic associations. In particular, magnetic anomalies near Karath-Dhaniyal show strong magnetic zones beneath the soil cover, with anomalies extending up to several km. The airborne electromagnetic (AEM) survey data also points to the presence of sulphide mineralization in the area, providing further evidence of the potential for base metal mineralization in the region.

In addition to the aerogeophysical surveys, ground magnetic surveys have been conducted in areas like Karath-Dhaniyal and Narsingpuri, highlighting several magnetic anomalies with extensions ranging from 250 m to 4 km. These anomalies are associated with magnetic mineral deposits, which may be related to the occurrence of base metals like copper and iron. The magnetic data from these surveys plays a crucial role in tracing the continuity of mineralized zones, guiding future exploration efforts.

**Known Mineral Occurrences**

The Salwari area, located near the Chaukri-Bamnara block, is home to the only known fluorite mine in the region. While the fluorite mine is now exhausted, the area remains geologically significant due to the presence of hornblendite and pyroxinite, which are intrusive rocks associated with the albitite line. GSI and AMD studies have reported significant copper values from the Salwari mine dump and the surrounding

area, although drilling has not been conducted to further assess these mineral occurrences.

In the Narsingpuri-Guman Singh Ki Dhani area, boreholes drilled by AMD intersected a variety of lithologies, including garnet biotite schist, amphibole marble, and quartz biotite schist, with mineralization mainly hosted in albitite-rich rocks. These boreholes have confirmed the presence of copper and molybdenum mineralization, which is essential for future exploration and exploitation of the area.

**Aerogeophysical and Geophysical Mapping**

The region was also subjected to an airborne geophysical survey under the Operation Hard Rock (OHR) project. The aero electromagnetic map shows a 5 to 6 channel anomaly in two locations, suggesting strong conductive zones that could be indicative of sulphide mineralization. This is supported by magnetic anomalies recorded in the area, with anomalies indicating a magnetic association. These anomalies have been key in identifying prospective areas for further drilling and exploration.

In conclusion, the South Khetri Belt, particularly the Chaukri-Bamnara block, exhibits significant mineral potential for base metals such as copper and molybdenum, as well as uranium. The combined geological, geochemical, drilling, and geophysical evidence points to the presence of mineralized zones that may be economically viable for further exploration and exploitation. However, more detailed drilling and follow-up studies are necessary to assess the full extent of these mineralized zones and their economic potential.

# CHAPTER-3

## 3.0.0 BLOCK DESCRIPTION WITH BOUNDARY COORDINATES/ FIELD VISIT LOCATIONS WITH COORDINATES

**Table-3.1. Block boundary coordinates, Salwari and Surrounding area, Sikar district, Rajasthan.**

| Cardinal Point | Latitude | Longitude |
|---|---|---|
| A | 27° 44' 28.699" N | 75° 39' 40.271" E |
| B | 27° 43' 41.152" N | 75° 39' 52.533" E |
| C | 27° 41' 25.940" N | 75° 38' 25.620" E |
| D | 27° 38' 33.754" N | 75° 35' 47.833" E |
| E | 27° 39' 12.925" N | 75° 35' 0.010" E |
| F | 27° 40' 36.967" N | 75° 36' 19.040" E |
| G | 27° 41' 12.383" N | 75° 35' 33.360" E |
| H | 27° 41' 59.904" N | 75° 36' 18.925" E |
| I | 27° 41' 37.711" N | 75° 36' 57.423" E |

## 3.1 Field Work by Vardan Environet LLP (Nov, 2024)

The reconnoitre field work for two days has been carried out in the proposed block area by Vardan Environet LLP. The litho units observed in the area are Cal-Silicate, Albitite, Hornblendite, Pegmatite etc. of Delhi super group. Bed rock samples from different litho units were collected. Collected bed rock samples were submitted to GSI, Chemical Laboratory, Western Region, Jaipur for chemical analysis. The results are appended in Annexure-IV.

**Table-3.2. Details of sample collected during field work by Vardan Environet LLP (Nov.2024)**

| Point | Location | Longitude | Latitude | Analysis | Lithology |
|---|---|---|---|---|---|
| D1 L1 | Near Chowkri Village | 75°37'13.72" E | 27°39'14.09"N | - | Cal-Silicate |
| D2 L2 | Salwari Old working | 75°35'45.42"E | 27°39'07.13"N | XRF, ICPMS, AAS | Albitite, Calcite-flourite vein |
| D3 L3 | Hornblendite Hill | 75°35'44.52"E | 27°39'18.18"N | XRF, AAS | Hornblendite |
| D4 L4 | Near Hill | 75°35'47.72"E | 27°39'18.94"N | XRF, ICPMS | Pegmatite-albitite |
| D5 L5 | Chala Village | 75°39'6.12"E | 27°40'07.75"N | XRF, ICPMS | Albitite |
| D6 L6 | Near bridge | 75°35'42.43"E | 27°37'23.84"N | - | Cal-silicate |

Out of four Samples collected by Vardan Environet LLP team (Nov, 2024) from the area one Sample indicated encouraging value of 2930 ppm of Cu and high Vanadium (2588 ppm) and high TiO2 27.03% Supports the field evidences indicating sulphide mineralisation.

## 3.3 Field Work by Vardan Environet LLP (July, 2025) for borehole planning

**Table-3.3. Details of field work by Vardan Environet LLP (July, 2025)**

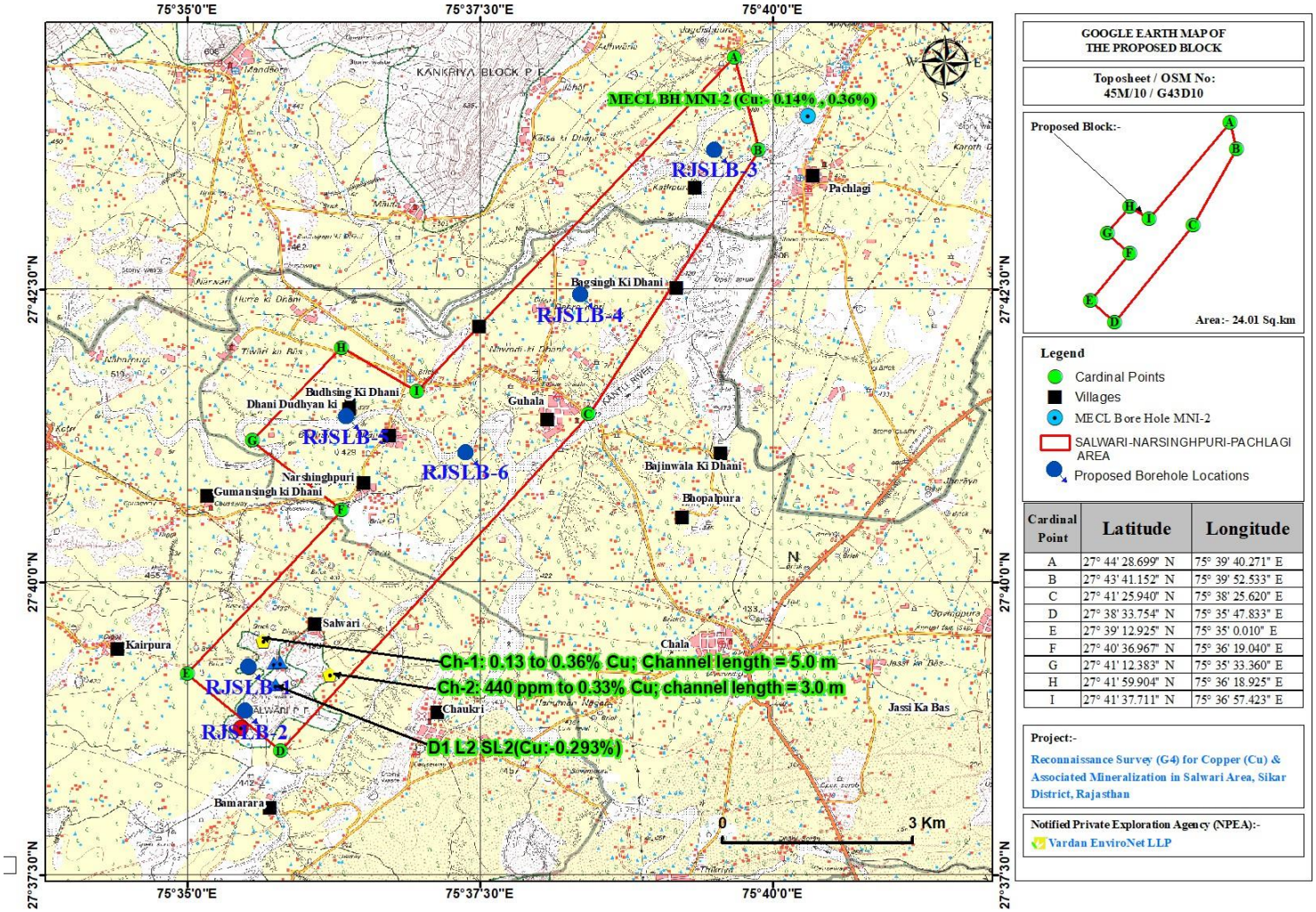
| Locality | Longitude | Latitude | Characteristics |
|---|---|---|---|
| Near Salwari (Sample Collected) | 75°35'31.8"E | 27°39'16.1"N | BH proposed by GSI (2015-16), Silicified zone with profussed Fe fillings & oxidation marks, quartz vein intruded into Albitite Zone (at last phase), fracture trend- N10°W, N30°E/80°NW, predominantly Albitite with thin interlayers of hornblendite towards S60°E from BH location. |
| Near Salwari (Sample Collected) | 75°35'28.4"E | 27°38'49.9"N | Old working (OW-1), Hornblendite, Albitite, Qtz vein with malachite staining, Malachite staining observed in the hornblendite rock at old working muck, OW-Length-15-20m, Width-10m, Depth-10m, Mine Muck- Malachite staining in hornblendite, Fluorite observed & old working exposed, Alternative veins of litho-sequences from SE to NE- silicified zone (5m)-Albitite (3m)- Hornblrndite (1m)-Silicified zone (3-5m)-Hornblendite & Albitite interlayered (5m)-Silicified Zone, Profiling along SE (OW-SE) |
| Near Salwari (Sample Collected) | 75°35'28.0"E | 27°38'49.1"N | 30m far away from OW-1, N80°E, Prominent Fracture plain & contact of Silicified zone & Hornblendite Marked with profussed Malachite and Azurite staining, 2nd OW in extension part of OW1, Ilmenite with Qtz Vein, Geode of Quartz |
| Near Dudiyon ki Dhani (Core Sample Collected) | 75°36'19"E | 27°41'23"N | Previously drilled AMD location, River Section |
| Near Pachlagi (Sample not Collected) | 75°39'58.2"E | 27°43'40.4"N | Small mound of interlayered sequence of Albitite, Calc-silicate & Quartz biotite schist, N30°E/76°NW |
| Near Pachlagi (Sample not Collected) | 75°40'06.3"E (Actual BH Loca. 75°40'00.9") | 27°43'46.21"N (Actual BH Loca. 27°43'49.6"N) | N30°E/70-75°NW, Albitite -Calc Silicate(10m)-Albitite (32m) |
| Near Pachlagi (Sample not Collected) | 75°39'50.6"E (Actual BH Loca. 75°39'50.3") | 27°43'31.4'N (Actual BH Loca. 27°43'31.6"N) | Proposed BH-5 is in same strike continuity of proposed BH-4. Albitite (43m)-Calc silicate (8m)- Albitite interlayered with quartz biotite schist (60m) |

**Note:- BH – BOREHOLE, OW- Old working**

## 3.4 Tentative Locations of Proposed Boreholes

| BH NAME | LATITUDE | LONGITUDE |
|---|---|---|
| RJSLB-1 | 27° 39' 16.559" N | 75° 35' 31.610" E |
| RJSLB-2 | 27° 38' 53.736" N | 75° 35' 29.647" E |
| RJSLB-3 | 27° 43' 41.381" N | 75° 39' 30.372" E |
| RJSLB-4 | 27° 42' 27.344" N | 75° 38' 21.436" E |
| RJSLB-5 | 27° 41' 24.834" N | 75° 36' 21.530" E |
| RJSLB-6 | 27° 41' 06.670" N | 75° 37' 22.760" E |

**Fig. 3.1 Proposed Borehole Locations.**




| Cardinal Point | Latitude | Longitude |
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| F | 27° 40' 36.967" N | 75° 36' 19.040" E |
| G | 27° 41' 12.383" N | 75° 35' 33.360" E |
| H | 27° 41' 59.904" N | 75° 36' 18.925" E |
| I | 27° 41' 37.711" N | 75° 36' 57.423" E |

**Project:-**

Reconnaissance Survey (G4) for Copper (Cu) & Associated Mineralization in Salwari Area, Sikar District, Rajasthan

**Notified Private Exploration Agency (NPEA):-**

Vardan EnviroNet LLP

# CHAPTER-4

## 4.0 PLANNED METHODOLOGY AND EXPLORATION TASK FLOW

The proposed exploration program is meticulously designed in accordance with the objectives outlined for Preliminary surveys (G-4) as stipulated in the Minerals (Evidence of Mineral Contents) Rule-2015. This comprehensive methodology encompasses several interrelated components; each aimed at establishing a detailed understanding of the geological and mineral potential of the area under investigation.

## 4.1 Large Scale Geological Mapping

Geological mapping is a foundational need of any exploration program. Mapping will be conducted over a specified area of 24.01 km² on 1:12,500 scale. The detailed mapping will involve:

**Litho-unit Identification:** The identification and characterization of various litho-units present in the area will be a key focus. This will include noting their mineralogical composition, physical properties, and distribution patterns.

**Contact Relationships:** The relationships between different litho-units, including their contacts and interactions, will be meticulously documented. Understanding these relationships is crucial for assessing mineralization potential.

**Textural and Structural Analysis:** The textural characteristics (e.g., grain size, shape, and arrangement) and structural features (e.g., folding, faulting) of the geological formations will be mapped. These elements are significant in understanding the geological history and potential for mineral deposits.

**Surface Manifestations:** Any visible surface manifestations of mineralization, such as veins, outcrops, and other geological indicators, will be carefully marked on the geological map. Their spatial disposition and distribution patterns will be analysed to identify prospective areas for further investigation.

## 4.2 Sampling and Analysis

### 4.2.1 Bed Rock

During the geological mapping phase, a targeted approach will be employed to collect bed rock samples from outcrops that exhibit signs of mineralization. Key indicators

include the presence of metal-oxides/sulphides, shearing, brecciation, oxidation, silicification, ferruginization, and other alteration features.

A total of 10 bed rock samples (including check samples) will be collected systematically from identified locations using chip, groove or channel sampling techniques. These samples will be prepared for laboratory analysis of XRF, AAS & ICPMS for **Basemetal and associated Mineralization**. To ensure the reliability and accuracy of the results, 10% check samples will be included in the analytical batch. These will consist of both internal duplicates and external standards.

### 4.2.2 Trench/Pit Sampling

To further investigate mineralized zones, a total of 60 cubic meters of trenching will be executed across approximately 6 trenches (dimensions: 10m x 1m x 1m) strategically located identified Mineralised zones. In conjunction with trenching, a total of 50 cubic meters of pitting will be executed, involving 25 pits with dimensions of 2m x 1m x 1m each. The trench walls will be mapped on 1:200 scale.

From this trenching/pit activity, approximately 110 samples will be generated and analysed with XRF & ICPMS for base Metals, which is well-established for determining mineral content. To bolster the reliability of these results, about 11 samples will be designated as check samples.

### 4.2.3 Core Sampling and geophysical logging

- 140 core samples (0.50 m length) will be collected from mineralised part from drilled boreholes. The 140 nos. of samples will be analysed by XRF, AAS & & ICPMS for base metal analysis. To ensure the quality and accuracy of the results, 14 additional check samples will also be collected. About 10 core samples collected for specific gravity determination. However, the quantum may change depending on the thickness of the mineralised zone intersected in the area.
- Geophysical Borehole Logging: Geophysical borehole logging (natural Gamma) will carried in all 6 drilled boreholes up to 250 m (in each BH).
- Borehole deviation survey by Multi shot camera will also carry in all 6 drilled boreholes up to 250 m (in each BH).

### 4.2.4 Geochemical and Lab Analysis

At the G4 level of mineral exploration, we're undertaking an extensive program involving approximately 297 samples (including check samples). The aim is to analyse these samples for their base metal content and associated minerals and selected samples for Au. This will help identifying the mineralised zone and resource estimation.

## 4.3 Surveying:

The block boundary will be surveyed by DGPS and total station in WGS-84 datum for demarcation of proposed area boundary points. Survey party will also carry out surface features, contouring in the proposed area and associated with Geological activities for taking up outcrop, Pitting/ Trenching, channel sample collection, location of sample points and plotting it on the map for proper interpretation of the sample data. Further, during the drilling programme, the survey party will carry out borehole fixation and determination of reduced level and co-ordinates of the boreholes.

## 4.4 Core drilling:

Based on the results of surface exploration, such as geological mapping, geochemical survey and pitting/ trenching in an area of 24.01 sq.km. scout boreholes shall be drilled in delineated mineralized zone to establish the continuity of mineralized zones in strike & dip. It is planned to drill 6 numbers of boreholes of 250 metre each, totalling to a 1500m drilling meterage in phased manner.

## 4.5 Petrological Studies

Petrological studies are integral to understanding the mineralogical characteristics of the litho-units. During the geological mapping phase:

- A total of 10 samples will be selected from various litho-units for detailed petrographic analysis. This will involve examining thin sections under a microscope to ascertain the mineral composition and texture.

- Additionally, 10 samples will undergo polished section analysis (Mineralographic studies) to explore the assemblages of metal oxide/sulphide minerals present. The

focus will be on understanding their distribution, alteration processes, and potential for economic mineralization.

### 4.6 Remote Sensing and Data Analysis

Remote sensing techniques will be leveraged to augment the geological mapping efforts:

- A comprehensive remote sensing study will be conducted over the entire 24.01 sq. km area to identify key geological features such as lineaments, lithological contacts, and other structural elements. This analysis will help in delineating mineral potential zones.

- Multispectral imaging and Digital Elevation Model (DEM) data that are available in public domain will be utilized to enhance geological interpretations and provide a spatial context for surface and subsurface features.

### 4.8 Final Report Submission

Upon completion of the exploration activities, a detailed final report will be compiled, encompassing the following key components:

- **Identification of Targets for G3 Stage:** The report will outline specific targets for further exploration at the G3 stage, focusing on additional ore bodies that show potential for economic viability.

- **Comprehensive Data Analysis:** A thorough analysis and interpretation of the geochemical, geological, and petrological data collected during the survey will be presented, highlighting significant findings and implications.

- **Recommendations for Further Exploration:** Based on the findings, the report will provide actionable recommendations for subsequent exploration phases, ensuring a strategic approach to resource assessment and potential development.

This structured and multifaceted methodology aims to ensure a comprehensive understanding of the mineral potential of the area, paving the way for informed decision-making in future exploration and development initiatives.

**Fig.-4.1. Planned Methodology and Exploration task flow**

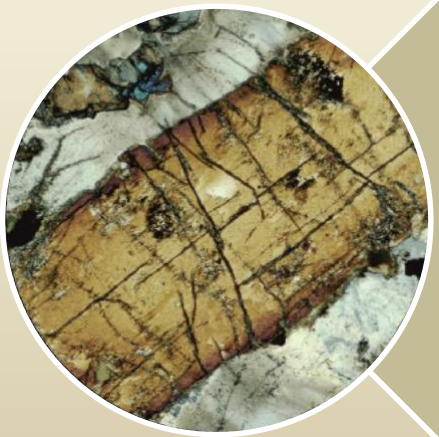
**1. Lithological Mapping (1:12,500), Sampling, Mineralogy, Geochemistry**

**Outcome:**- Identification of Mineralisation, Structural framework study, Lithology and Ore Minerals and zeroing down the area for drilling.

**2. Drilling, Core Sampling, logging, Metal assay**

**[6 BH, Each BH 250 m depth]**

**Outcome**:- Identification of Mineralized Zone, evaluation of mineral resources



**3. Petrography and Whole rock and Trace Element Assay**

**Outcome**: -

- 1.Vector to additional target.
- 2. Identification Mineralisation Zone
- 3. Characterisation of Mineralised zones and Report with recommendation

## CHAPTER-5

### 5.0 NATURE QUANTUM AND TARGET

A table containing the NQT is given in Annexure I.

## CHAPTER-6

### 6.0 MANPOWER DEPLOYMENT

A table containing the manpower deployment table is given in Annexure II.

## CHAPTER-7

### 7.0 SUMMARY EXPENDITURE

The summary expenditure for each phase is given in Annexure III.

## CHAPTER-8

### 8.0 BREAKUP OF EXPENDITURE

The breakup expenditure for each phase is given in Annexure IV.

## CHAPTER-9

### 9.0 TIMELINE

**Fig.9.1 Time Schedule / action Plan**

**Time Schedule/ Action Plan for Reconnaissance Survey (G4) for copper and associated mineralization in Salwari-Narsinghpuri-Pachlagi Area, Sikar District, Rajasthan (Review After 5 Months)**

| S.N. | Activities | Months | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | REVIEW | 6 | 7 | 8 | 9 | 10 |
| 1 | Prefield Study | | | | | | | | | | | |
| 2 | Geological Mapping | | | | | | | | | | | |
| 3 | Pitting/Trenching | | | | | | | | | | | |
| 4 | Drilling & Logging | | | | | | | | | | | |
| 5 | Sampling | | | | | | | | | | | |
| 6 | Laboraory Study | | | | | | | | | | | |
| 7 | Petrographic Study | | | | | | | | | | | |
| 8 | Report Writing | | | | | | | | | | | |
| 9 | Peer Review & Report Submission | | | | | | | | | | | |

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# ANNEXURE -I

| NQT TABLE FOR RECONNAISSANCE SURVEY OF COPPER AND ASSOCIATED MINERALIZATION IN SALWARI-NARSINGHPURI-PACHLAGI AREA, SIKAR DISTRICT, RAJASTHAN.: A RECONNAISSANCE (G-4 STAGE) EXPLORATION PROPOSAL | | | | |
|---|---|---|---|---|
| **Area: 24.01 sq. km** | | **No. of BH: 6**<br>**Each Borehole depth range- 250 m** | | **Schedule timeline- 10 Months**<br>**Review: After: 5 Months** |
| **S.N.** | **Item of Work** | **Quantum** | **Target** | **Remarks** |
| **1.** | **Geological Work** | | | |
| a. | Geological Mapping (Scale 1:12,500) & sampling | 24.01 sq. km. | | |
| b. | Geologists (HQ) days (1 No) | 60 days | | Report writing, Multispectral and DEM data analysis, etc. |
| c. | Geologist field-days (2 No. geologists) | 100 days | Identification of anomalous mineralized zones for detailed characterization | Core logging, core sampling, BRS, supervision of trenching and pitting |
| d. | Labour (Field days) (2 workers per geologist, i.e. Total 4 No.) | 200 days | | |
| **B.** | **Survey work** | | | |
| a. | Demarcation of block boundary & boreholes | 10 Points | | BH fixation and Boundary Point Marking |
| **C.** | **Trenching/Pitting** | | | |
| a. | Trenching | 60 cu.m | | No. of Samples = 110 |
| b. | Pitting | 50 cu.m | | |
| **2.** | **Geochemical Sampling** | | | |
| a. | Bed rock sampling (Nos.) | 40 | | |
| b. | Trench/pit sampling (Nos.) | 110 | | |
| c. | Core sampling (Nos.) | 140 | | |

| | | | | |
|---|---|---|---|---|
| **3.** | **Geophysical Survey-Outsource** | | | |
| a. | Borehole Geophysical logging (natural gamma) (6 BH) | 1500 m | | |
| **4** | **Core Drilling (1500 m/ 6 BH)-Outsource** | | | |
| a. | Drilling (1500 m / 6 BH) | 1500 m | To identify subsurface lithology | No. of samples = 140 |
| b. | Borehole deviation survey by Multi shot camera | 1500 m | | |
| | **Sub Total :- 6** | | | |
| **5.** | **Laboratory Study-Outsource** | | | |
| a. | XRF for whole rock analysis (including check sample) | 121 Nos. | Fertility assessment and target selection | BRS (11), Core (0), Trench/pit (110) |
| b. | ICPMS with U, Th (including check sample) | 50 Nos. | | BRS (6), Core (33), Trench/pit (11) |
| c. | AAS (Cu, Pb, Zn, Ni, Co, Au, Ag, &V) (including check sample) | 138 Nos. | | BRS (28), Core (110) |
| d. | Density | 10 Nos. | | Core (10) |
| **6.** | **Petrological studies-Outsource** | | | |
| a. | Study of thin section for petrography | 10 Nos | Fertility assessment and target selection | |
| b. | Study of polished section for mineragraphy | 10 Nos | | |
| **7.** | **Preparation of Exploration Proposal** | | | |
| **8.** | **Geological Report Preparation** | | | |
| **9.** | **Peer Review charge** | | | |

## ANNEXURE -II

| SUMMARY EXPENDITURE FOR FOR RECONNAISSANCE SURVEY OF COPPER AND ASSOCIATED MINERALIZATION IN SALWARI-NARSINGHPURI-PACHLAGI AREA, SIKAR DISTRICT, RAJASTHAN: A RECONNAISSANCE (G-4 STAGE) EXPLORATION PROPOSAL | | | |
|---|---|---|---|
| **Sl. No** | **Item** | **Estimated Cost in INR** | |
| 1. | Geological Mapping (1:12,500) and Other Geological Work | ₹ | **26,27,400** |
| 2. | Survey work | ₹ | **2,40,000** |
| 3. | Trenching/Pitting | ₹ | **4,83,750** |
| 4. | Sample Preparation | ₹ | **3,90,546** |
| 5. | Core Drilling & allied works | ₹ | **1,61,23,500** |
| 6. | Laboratory Study | ₹ | **14,97,428** |
| 7. | Petrological studies | ₹ | **69,000** |
| 8. | **Total (Sno.1 to 7)** | ₹ | **2,14,31,624** |
| 9. | Preparation of Exploration Proposal | ₹ | **4,28,632** |
| 10. | Geological Report Preparation | ₹ | **7,50,000** |
| 11. | Technical Supervision charge | ₹ | **15,00,000** |
| 12. | Peer Review charge | ₹ | **30,000** |
| 13. | **Total (Sno.8 to 13)** | ₹ | **2,41,40,256** |
| 14. | Add GST @ 18% | ₹ | **43,45,246** |
| | **Grand Total Including GST** | ₹ | **2,84,85,503** |
| | **Rs. In Lakh** | ₹ | **284.86** |

## ANNEXURE -III

**Estimated Cost for Reconnaissance Survey (G4) for copper and associated mineralization in Salwari-Narsinghpuri-Pachlagi Area, Sikar District, Rajasthan Area: 24.01 Sq. Km, No. of BH: 6 (Avg. depth: 250 m each = 1500m), Timeline- 10 Months, Review: After 5 Months Implementing Agency: Vardan Environet LLp**

| Sl. No. | Item of Work | SoC Sr. No. | Units | Qty | Cost per unit/ per day/ manday (In Rs.) | Total Amount (In Rs.) | Remarks |
|---|---|---|---|---|---|---|---|
| **1** | **Geological Mapping (Scale 1:12,500)** | | | | | | |
| a. | Large scale (LSM) Geological Mapping | 1.1a | Per Sq Km | 24 | ₹ 18,300.00 | ₹ 4,39,200.00 | |
| b. | Charges of Geologist (field) | 1.2.1a | Mandays | 100 | ₹ 14,500 | ₹ 14,50,000 | Geological Mapping on 1:12,500 Scale, core logging, sampling (BRS & Core), supervision of trenching and pitting |
| c. | Labour Charges (2 Helper for each geo) | 5.8 | Mandays | 200 | ₹ 541 | ₹ 1,08,200 | Amount will be reimburse as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher |
| d. | Geologists (HQ) days(1 No) | 1.2.1a | Mandays | 60 | ₹ 10,500 | ₹ 6,30,000 | |
| | **Sub Total :- 1** | | | | | **₹ 26,27,400** | |
| **2** | **Survey work-out source** | | | | | | |
| a. | Demarcation of block boundary & boreholes | 1.3.2 | Per point | 10 | ₹ 24,000 | ₹ 2,40,000 | 6 BHs and 9 boundary coordinates |
| | **Sub Total :- 2** | | | | | **₹** | |

| Sl. No. | Item of Work | SoC Sr. No. | Units | Qty | Cost per unit/ per day/ manday (In Rs.) | Total Amount (In Rs.) | Remarks |
|---|---|---|---|---|---|---|---|
| | | | | | | **2,40,000** | |
| **3** | **Trenching/Pitting** | | | | | | |
| a. | Trenching | 2.1.1 | cu.m | 60 | ₹ 4,125 | ₹ 2,47,500 | No of sample = 170 |
| b. | Pitting | 2.1.2 | cu.m | 50 | ₹ 4,725 | ₹ 2,36,250 | |
| | **Sub Total :- 3** | | | | | **₹ 4,83,750** | |
| **4** | **Sample Preparation** | | | | | | |
| a. | Sampler charges for Sample processing work | 1.2.1b | Mandays | 39 | ₹ 7,850 | ₹ 3,06,150 | |
| b. | Labour(Field days)(2workers per sampler) | 5.8 | Mandays | 156 | ₹ 541 | ₹ 84,396 | Amount will be reimburse as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher |
| | **Sub Total :- 4** | | | | | **₹ 3,90,546** | |
| **5** | **Core Drilling 1500 m/ 6 BH)** | | | | | | |
| a. | Drilling up to depth of 400m (HQ-Up to 50m each BH) | 2.2.1.1d | Per m | 1500 | ₹ 10,000 | ₹ 1,50,00,000 | |
| b. | Borehole Geophysical logging (Natural Gamma) | 3.11h | m | 1500 | ₹ 116 | ₹ 1,74,000 | |
| c. | Borehole deviation survey by Multi shot camera | 2.2.5 | Per Shot | 250 | ₹ 330 | ₹ 82,500 | This amount will be reimbursed after successful delivery of the cores to concerned libraries/authorities |
| d. | Construction of concrete Pillar (12"x12"x30" | 2.2.7 | per/BH | 6 | ₹ 2,000 | ₹ 12,000 | |

| Sl. No. | Item of Work | SoC Sr. No. | Units | Qty | Cost per unit/ per day/ manday (In Rs.) | Total Amount (In Rs.) | Remarks |
|---|---|---|---|---|---|---|---|
| e. | Borehole plugging by cement | 2.2.8 | per /BH | 6 | ₹ 10,000 | ₹ 60,000 | |
| f. | Drill Core Preservation | 5.3 | Per/m | 500 | ₹ 1,590 | ₹ 7,95,000 | |
| | **Sub Total :- 5** | | | | | **₹ 1,61,23,500** | |
| **6** | **Laboratory Study-outsource** | | | | | | |
| **6.1** | **Bed Rock Samples** | | | | | | |
| a. | Bed Rock samples by XRF for whole rock analysis | 4.1.17a | Nos | 10 | ₹ 4,200 | ₹ 42,000 | |
| | External Check 10% | 4.1.17a | Nos | 1 | ₹ 4,200 | ₹ 4,200 | |
| b. | Bed Rock samples by ICPMS with U, Th | 4.1.15 | Nos | 5 | ₹ 7,400 | ₹ 37,000 | |
| | External Check 10% | 4.1.15 | Nos | 1 | ₹ 7,400 | ₹ 7,400 | |
| c. | Bed Rock samples by AAS (Cu, Pb, Zn, Ni, Co,V, Au, Ag) | 4.1.8 a&b | Nos | 25 | ₹ 4,306 | ₹ 1,07,650 | |
| | External Check 10% | 4.1.8 a&b | Nos | 3 | ₹ 4,306 | ₹ 12,918 | |
| **6.2** | **Drill Core Samples** | | | | | | |
| a. | Drill core samples by ICPMS | 4.1.15 | Nos | 30 | ₹ 7,400 | ₹ 2,22,000 | |
| | External Check 10% | 4.1.15 | Nos | 3 | ₹ 7,400 | ₹ 22,200 | |
| b. | Bed Rock samples by AAS (Cu, Pb, Zn, Ni, Co,V, Au, Ag) | 4.1.8 a&b | Nos | 100 | ₹ 4,306 | ₹ 4,30,600 | |
| | External Check 10% | 4.1.8 a&b | Nos | 10 | ₹ 4,306 | ₹ 43,060 | |

| Sl. No. | Item of Work | SoC Sr. No. | Units | Qty | Cost per unit/ per day/ manday (In Rs.) | Total Amount (In Rs.) | Remarks |
|---|---|---|---|---|---|---|---|
| c. | Density | 4.8.3 | Nos | 10 | ₹ 2,500 | ₹ 25,000 | |
| **6.3** | **Trench/Pit Samples** | | | | | | |
| a. | Trench samples by ICPMS | 4.1.15 | Nos | 10 | ₹ 7,400 | ₹ 74,000 | |
| | External Check 10% | 4.1.15 | Nos | 1 | ₹ 7,400 | ₹ 7,400 | |
| b. | Trench samples by XRF (Whole rock analysis) | 4.1.17a | Nos | 100 | ₹ 4,200 | ₹ 4,20,000 | |
| | External Check 10% | 4.1.17a | Nos | 10 | ₹ 4,200 | ₹ 42,000 | |
| | **Sub Total :- 6** | | | | | **₹ 14,97,428** | |
| **7** | **Petrological studies** | | | | | | |
| a. | Preparation of thin section | 4.3.1 | Nos | 10 | ₹ 500 | ₹ 5,000 | |
| b. | Study of thin section for petrography | 4.3.4 | Nos | 10 | ₹ 2,800 | ₹ 28,000 | |
| c. | Preparation of polished section | 4.3.2 | Nos | 10 | ₹ 800 | ₹ 8,000 | |
| d. | Study of polished section for mineragraphy | 4.3.4 | Nos | 10 | ₹ 2,800 | ₹ 28,000 | |
| | **Sub Total :-7** | | | | | **₹ 69,000** | |
| | **Total (Sno.1 to 7)** | | | | | **₹ 2,14,31,624** | |
| **8** | **Preparation of Exploration Proposal** | **5.1** | | | | **₹ 4,28,632** | |

| Sl. No. | Item of Work | SoC Sr. No. | Units | Qty | Cost per unit/ per day/ manday (In Rs.) | Total Amount (In Rs.) | Remarks |
|---|---|---|---|---|---|---|---|
| **9** | **Geological Report Preparation** | **5.2(iii)** | | **Total cost of the project exceeding 150 Lakh ₹7.50** | | **₹ 7,50,000** | |
| **11** | **Technical Supervision charge** | **6** | | | | **₹ 15,00,000** | In case of outsourcing of work, the technical supervision cost shall be 10% of the sum of all outsource work components with a maximum ceiling of 20 lakh. |
| **12** | **Peer Review charge** | **As per EC** | | | | **₹ 30,000** | |
| | | | | | **Grand Total** | **₹ 2,41,40,256** | |
| | Add GST @ 18% | | | | **18%** | **₹ 43,45,246** | |
| | | | | | **Grand Total Including GST** | **₹ 2,84,85,503** | |
| | | | | | **Rs in Lakh** | **₹ 284.86** | |

| Sl. No. | Item of Work | SoC Sr. No. | Units | Qty | Cost per unit/ per day/ manday (In Rs.) | Total Amount (In Rs.) | Remarks |
|---|---|---|---|---|---|---|---|
| a. | Charges of Surveyor | 1.6.1b | Per day | 15 | ₹ 8,300 | ₹ 1,24,500 | For Toporgaphic Survey, BH fixation and Boundary Point Marking |
| b. | Labours Charges for survey work | 1.6.1b | Per day | 60 | ₹ 541 | ₹ 32,460 | Amount will be reimburse as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher |
| c. | Demarcation of block boundary & boreholes | 1.6.2 | Per point | 15 | ₹ 19,200 | ₹ 2,88,000 | 6 BHs and 9 boundary coordinates |
| | **Sub Total :- 2** | | | | | **₹ 4,44,960** | |
| **3** | **Trenching/Pitting** | | | | | | |
| a. | Trenching | 2.1.1 | cu.m | 60 | ₹ 3,330 | ₹ 1,99,800 | No of sample = 170 |
| b. | Pitting | 2.1.2 | cu.m | 50 | ₹ 3,800 | ₹ 1,90,000 | |
| | **Sub Total :- 3** | | | | | **₹ 3,89,800** | |
| **4** | **Sample Preparation** | | | | | | |
| a. | Sampler charges for Sample processing work | 1.5.2 | Mandays | 39 | ₹ 5,100 | ₹ 1,98,900 | |
| b. | Labour(Field days)(2workers per sampler) | 5.7 | Mandays | 156 | ₹ 541 | ₹ 84,396 | Amount will be reimbursd as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher |

| Sl. No. | Item of Work | SoC Sr. No. | Units | Qty | Cost per unit/ per day/ manday (In Rs.) | Total Amount (In Rs.) | Remarks |
|---|---|---|---|---|---|---|---|
| | **Sub Total :- 4** | | | | | **₹ 2,83,296** | |
| **5** | **Core Drilling 1500 m/ 6 BH)** | | | | | | |
| a. | Drilling (HQ Size Core) (6 BH)(Hard Rock), 240m | 2.2.4a | Per m | 240 | ₹ 13,800 | ₹ 33,12,000 | |
| b. | Drilling (NQ Size Core) (6 BH)(Hard Rock of <300m), 1260 m | 2.2.1.4 a | Per m | 1260 | ₹ 11,500 | ₹ 1,44,90,000 | |
| c. | Drill Core Preservation | 5.3 | Per m | 750 | ₹ 1,590 | ₹ 11,92,500 | This amount will be reimbursed after successful delivery of the cores to concerned libraries/authorities |
| d. | Borehole Geophysical logging | 3.12 | m | 1500 | ₹ 10,88,941 | ₹ 10,88,941 | |
| e. | Borehole deviation survey by Multi shot camera | 2.2.6 | Per m | 1500 | ₹ 330 | ₹ 4,95,000 | |
| | **Sub Total :- 5** | | | | | **₹ 2,05,78,441** | |
| **6** | **Laboratory Study** | | | | | | |
| **6.1** | **Bed Rock Samples** | | | | | | |
| a. | Bed Rock samples by XRF for whole rock analysis | 4.1.15 a | Nos | 10 | ₹ 4,200 | ₹ 42,000 | |

| Sl. No. | Item of Work | SoC Sr. No. | Units | Qty | Cost per unit/ per day/ manday (In Rs.) | Total Amount (In Rs.) | Remarks |
|---|---|---|---|---|---|---|---|
| | External Check 10% | 4.1.15 a | Nos | 1 | ₹ 4,200 | ₹ 4,200 | |
| b. | Bed Rock samples by ICPMS | 4.1.13 | Nos | 5 | ₹ 5,380 | ₹ 26,900 | |
| | External Check 10% | 4.1.13 | Nos | 1 | ₹ 5,380 | ₹ 5,380 | |
| c. | Bed Rock samples by AAS (Cu, Pb, Zn, Ni, Co,V,U,Au,Ag) | 4.1.7a &b | Nos | 25 | ₹ 3,846 | ₹ 96,150 | |
| | External Check 10% | 4.1.7a &b | Nos | 3 | ₹ 3,846 | ₹ 11,538 | |
| **6.2** | **Drill Core Samples** | | | | | | |
| a. | Drill core samples by ICPMS | 4.1.13 | Nos | 30 | ₹ 5,380 | ₹ 1,61,400 | |
| | External Check 10% | 4.1.13 | Nos | 3 | ₹ 5,380 | ₹ 16,140 | |
| b. | Bed Rock samples by AAS (Cu, Pb, Zn, Ni, Co,V,U,Au,Ag) | 4.1.7a | Nos | 100 | ₹ 3,846 | ₹ 3,84,600 | |
| | External Check 10% | 4.1.7a | Nos | 10 | ₹ 3,846 | ₹ 38,460 | |
| c. | Density | 4.8.3 | Nos | 10 | ₹ 1,568 | ₹ 15,680 | |
| **6.3** | **Trench/Pit Samples** | | | | | | |
| a. | Trench samples by ICPMS | 4.1.13 | Nos | 10 | ₹ 5,380 | ₹ 53,800 | |
| | External Check 10% | 4.1.13 | Nos | 1 | ₹ 5,380 | ₹ 5,380 | |

| Sl. No. | Item of Work | SoC Sr. No. | Units | Qty | Cost per unit/ per day/ manday (In Rs.) | Total Amount (In Rs.) | Remarks |
|---|---|---|---|---|---|---|---|
| b. | Trench samples by XRF (Whole rock analysis) | 4.1.15 a | Nos | 100 | ₹ 4,200 | ₹ 4,20,000 | |
| | External Check 10% | 4.1.15 a | Nos | 10 | ₹ 4,200 | ₹ 42,000 | |
| | **Sub Total :- 6** | | | | | **₹ 13,23,628** | |
| **7** | **Petrological studies** | | | | | | |
| a. | Preparation of thin section | 4.3.1 | Nos | 10 | ₹ 2,353 | ₹ 23,530 | |
| b. | Study of thin section for petrography | 4.3.4 | Nos | 10 | ₹ 4,232 | ₹ 42,320 | |
| c. | Preparation of polished section | 4.3.2 | Nos | 10 | ₹ 1,549 | ₹ 15,490 | |
| d. | Study of polished section for mineragraphy | 4.3.4 | Nos | 10 | ₹ 4,232 | ₹ 42,320 | |
| e. | Digital photomicrograph of thin polished | 4.3.7 | Nos | 20 | ₹ 280 | ₹ 5,600 | |
| | **Sub Total :-7** | | | | | **₹ 1,29,260** | |
| | **Total (Sno.1 to 7)** | | | | | **₹ 2,51,86,815** | |
| **8** | **Preparation of Exploration Proposal** | **5.1** | | | | **₹ 5,00,000** | |
| **9** | **Geological Report Preparation** | **5.2(iii)** | | **Total project cost ₹150 lakh but less than 300 lakhs: A Minimum of ₹7.5 lakh or 3% of the work** | | **₹ 7,55,604** | |

| Sl. No. | Item of Work | SoC Sr. No. | Units | Qty | Cost per unit/ per day/ manday (In Rs.) | Total Amount (In Rs.) | Remarks |
|---|---|---|---|---|---|---|---|
| | | | | **whichever is more and ₹3000/- per each additional copy.** | | | |
| **10** | **Tender Processing Cost** | **2.3** | | **2% of the approved project cost or 5 lakh whichever is lower will be paid one time to Exploration Agency** | | **₹ 5,00,000** | |
| **11** | **Operation Charges** | **6(iii)** | | **₹8.75 lakh plus 5 percent on the balance amount of outsourced cost in excess of ₹1 crore** | | **₹ 16,34,341** | |
| **12** | **Peer Review charge** | **As per EC** | | | | **₹ 30,000** | |
| | | | | | **Grand Total** | **₹ 2,86,06,760** | |
| | Add GST @ 18% | | | | **18%** | **₹ 51,49,217** | |
| | | | | | **Grand Total Including GST** | **₹ 3,37,55,977** | |
| | | | | | **Rs in Lakh** | **₹ 338** | |

# ANNEXURE -IV

A/RNO - 3005/24
Date - 24/12/24

भारत सरकार / GOVERNMENT OF INDIA
भारतीय भूवैज्ञानिक सर्वेक्षण / GEOLOGICAL SURVEY OF INDIA
पश्चिमी क्षेत्र / WESTERN REGION
रसायन प्रभाग / CHEMICAL DIVISION

Checked

Office: 15-16, Khanij Bhawan, GSI Complex,
Jhalana Institutional Area, Jhalana Doongri,
Jaipur-302004, Rajasthan

Phone: 0141-2710753
Email: dir.chem.wr@gsi.gov.in

## CHEMICAL ANALYSIS REPORT

1. Sender's Name : **Director, TCS Division, GSI WR**
2. Sender's Letter No : **218/TCS/WR/2024-25**
3. Nature of Sample: **Rock Sample**
4. Name of the Party: **VARDAN ENVIRONET LLP**
5. Nature of Test desired by the party: **XRF Analysis**
6. Preliminary Registration No.: **Y-715 (1-07)**
7. Date of Registration: **-27/11/2024**
8. Method of Analysis: **GSI/CL/JPR/SOP/02/XRF/2A Issue No. 2**
9. Instrument used: **WD XRF**
10. Working group: **Dr. S. K. Mandal (Dir.), Dr. M.P. Ashok Sr. Chemist, Sandeep Singh Vinod K. Jangid, Mohit, Chemists, Dr Abhilasha, Asstt Chemist.**

| Seq no. | Sample No/ Ref No | SiO2 (%) | Al2O3 (%) | Fe2O3 (%) | MnO (%) | MgO (%) | CaO (%) | Na2O (%) | K2O (%) | TiO2 (%) | P2O5 (%) | Ba (ppm) | Ga (ppm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Y-715-1 Box-1/SL-2 | 8.67 | 0.30 | 37.47 | 0.18 | 0.92 | 16.22 | 0.03 | 0.04 | 27.03 | 0.42 | 726 | 4 |
| 2 | Y-715-2 Box-1/AS-5 | 82.08 | 5.20 | 2.92 | 0.03 | 0.41 | 0.90 | 3.25 | 2.26 | 0.28 | 0.21 | 267 | 11 |
| 3 | Y-715-3 Box-1/Bi-6 | 71.83 | 9.64 | 2.18 | 0.02 | 0.90 | 0.99 | 3.78 | 6.15 | 0.80 | 0.24 | 916 | 22 |
| 4 | Y-715-4 Box-1/Bi-7 | 77.30 | 9.62 | 0.53 | 0.01 | 0.19 | 0.81 | 7.40 | 2.48 | 0.10 | 0.13 | 398 | 28 |
| 5 | Y-715-5 Box-2/SL-1 | 52.51 | 1.66 | 13.29 | 0.06 | 12.13 | 8.38 | 1.62 | 0.33 | 0.63 | 0.08 | 135 | 16 |
| 6 | Y-715-6 Box-3/SL-3 | 80.92 | 4.85 | 1.53 | 0.01 | 1.11 | 0.98 | 6.44 | 0.05 | 0.24 | 0.15 | 189 | 11 |
| 7 | Y-715-7 Box-3/SL-4 | 56.78 | 7.12 | 8.12 | 0.11 | 4.87 | 8.25 | 5.76 | 1.14 | 0.64 | 0.27 | 152 | 19 |

| Seq no. | Sample No/ Ref No | Sc (ppm) | V (ppm) | Th (ppm) | Pb (ppm) | Ni (ppm) | Co (ppm) | Rb (ppm) | Cr (ppm) | Sr (ppm) | Zr (ppm) | Nb (ppm) | Cu (ppm) | Zn (ppm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Y-715-1 Box-1/SL-2 | 44 | 2588 | 12 | 4 | 38 | 49 | 21 | 473 | 27 | 10 | 401 | 2930 | 29 |
| 2 | Y-715-2 Box-1/AS-5 | 5 | 35 | 26 | 13 | 19 | 5 | 81 | 219 | 24 | 61 | 17 | 25 | 5 |
| 3 | Y-715-3 Box-1/Bi-6 | 7 | 60 | 91 | 75 | 28 | 3 | 29 | 152 | 65 | 325 | 53 | 10 | 5 |
| 4 | Y-715-4 Box-1/Bi-7 | 2 | 16 | 23 | 20 | 16 | 4 | 72 | 135 | 69 | 76 | 76 | 8 | 4 |
| 5 | Y-715-5 Box-2/SL-1 | 80 | 90 | 9 | 13 | 70 | 57 | 21 | 152 | 21 | 15 | 57 | 174 | 12 |
| 6 | Y-715-6 Box-3/SL-3 | 3 | 24 | 40 | 22 | 19 | 5 | 24 | 179 | 33 | 325 | 23 | 20 | 4 |
| 7 | Y-715-7 Box-3/SL-4 | 31 | 50 | 22 | 21 | 50 | 19 | 64 | 147 | 120 | 136 | 38 | 10 | 19 |

The report related to particular sample(s) tested under stated condition Result pertains to the sample(s) only

Sample(s) not drawn by us Any discrepancy in this report should be brought to notice within 15 days from the date of certificate.

# Value is indicative only as standard is not available

Dr Abhilasha
Assistant Chemist

Mohit
Chemist

Dr. Vinod K Jangid
Chemist

Sandeep Singh
Chemist

Sonali Meena
Sr. Chemist

Reviewed by

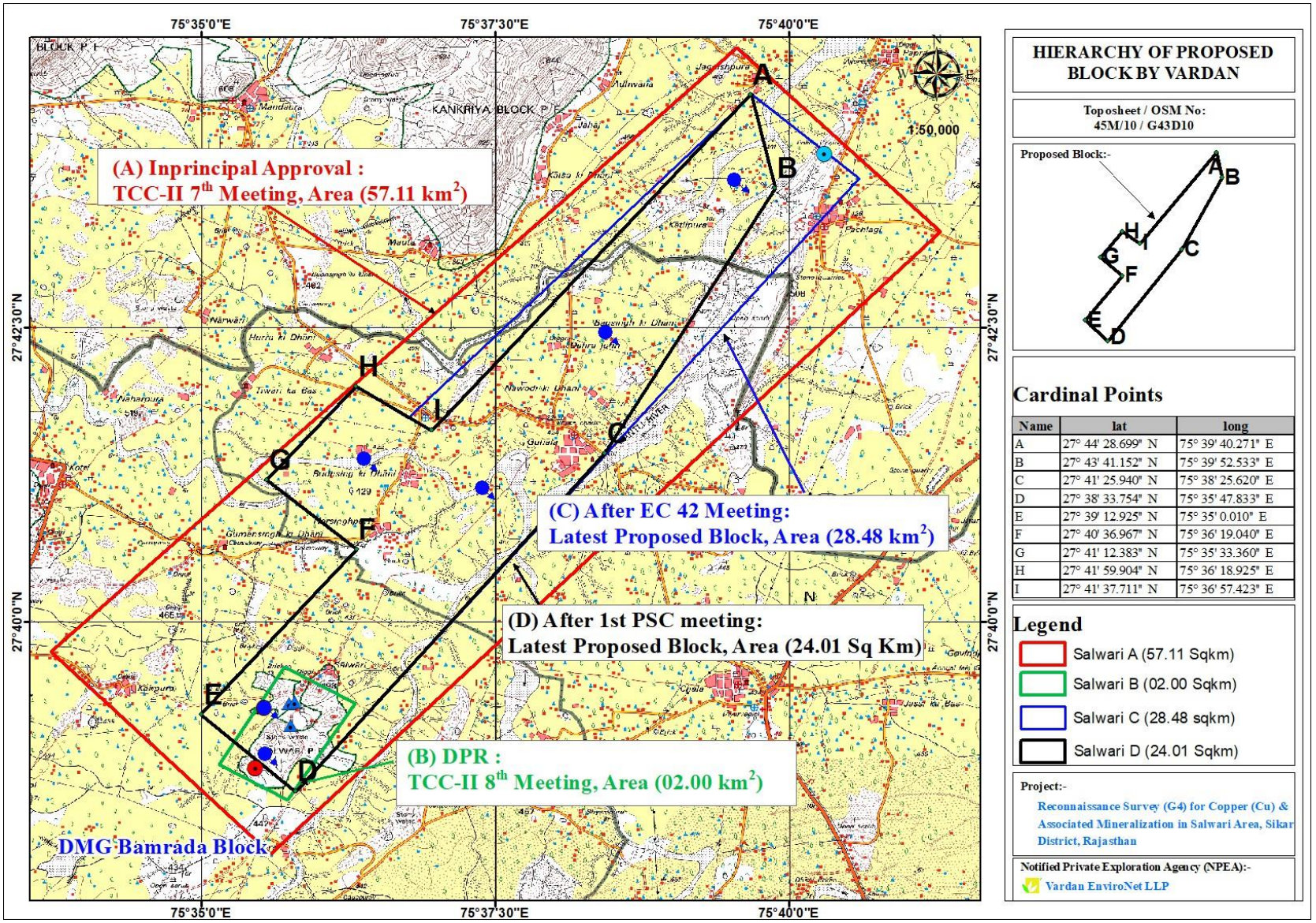
Dr. M.P.Ashok
Sr. Chemist

Authorised Signatory

Dr. SUSHIL KUMAR MANDAL
डॉ. सुशील कुमार मण्डल
निदेशक (रसायन) / Director (Chemistry)
भारतीय भूवैज्ञानिक सर्वेक्षण, प. क्षे. जयपुर
Geological Survey of India, W. R., Jaipur

Dr. S. K. Mandal 16/12/2024
Director (Chemistry)

Geological Survey of India, Jaipur




**HIERARCHY OF PROPOSED BLOCK BY VARDAN**

Toposheet / OSM No:
45M/10 / G43D10

Proposed Block:-




## Cardinal Points

| Name | lat | long |
|---|---|---|
| A | 27° 44' 28.699" N | 75° 39' 40.271" E |
| B | 27° 43' 41.152" N | 75° 39' 52.533" E |
| C | 27° 41' 25.940" N | 75° 38' 25.620" E |
| D | 27° 38' 33.754" N | 75° 35' 47.833" E |
| E | 27° 39' 12.925" N | 75° 35' 0.010" E |
| F | 27° 40' 36.967" N | 75° 36' 19.040" E |
| G | 27° 41' 12.383" N | 75° 35' 33.360" E |
| H | 27° 41' 59.904" N | 75° 36' 18.925" E |
| I | 27° 41' 37.711" N | 75° 36' 57.423" E |

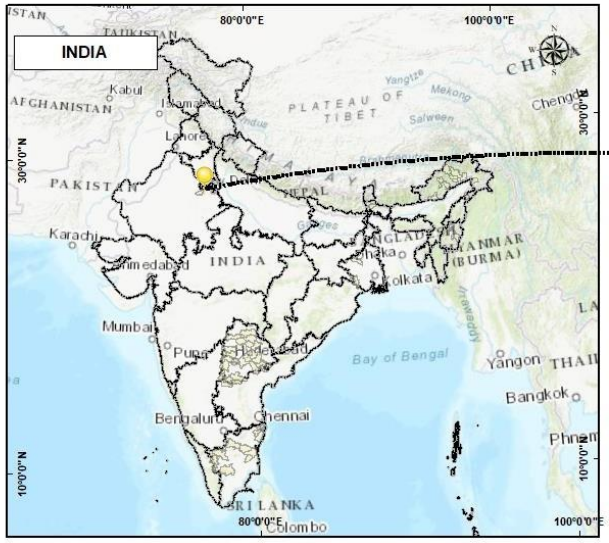
## Legend

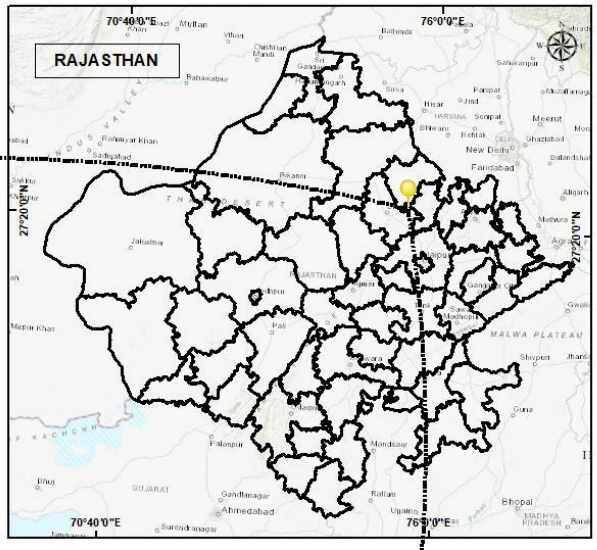
- Salwari A (57.11 Sqkm)
- Salwari B (02.00 Sqkm)
- Salwari C (28.48 sqkm)
- Salwari D (24.01 Sqkm)

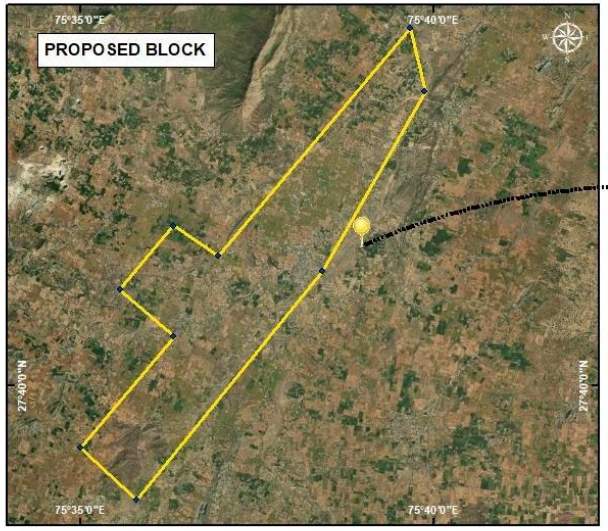
Project:-
Reconnaissance Survey (G4) for Copper (Cu) & Associated Mineralization in Salwari Area, Sikar District, Rajasthan

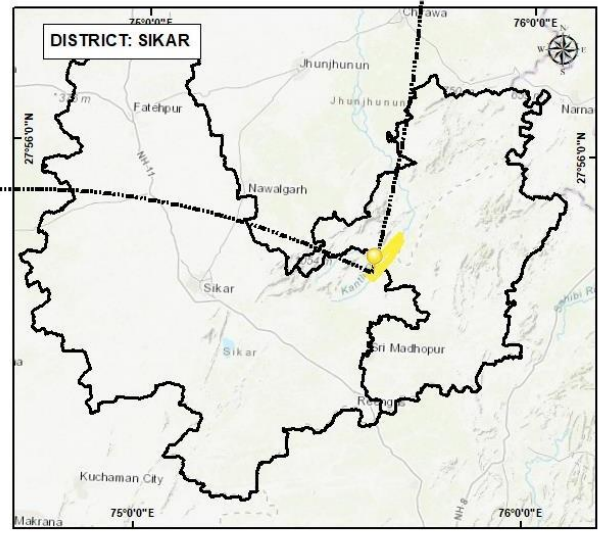
Notified Private Exploration Agency (NPEA):-
Vardan EnviroNet LLP

# PLATE-II




**LOCATION MAP OF PROPODED BLOCK**

**Toposheet / OSM No:**
**45M/10 / G43D10**

**Proposed Block:-**

**Area:- 24.01 Sq.km**

**Legend**

- Salwari_1st_psc_CP
- SALWARI-NARSINGHPURI-PACHLAGI AREA

| Cardinal Point | Latitude | Longitude |
|---|---|---|
| A | 27° 44' 28.699" N | 75° 39' 40.271" E |
| B | 27° 43' 41.152" N | 75° 39' 52.533" E |
| C | 27° 41' 25.940" N | 75° 38' 25.620" E |
| D | 27° 38' 33.754" N | 75° 35' 47.833" E |
| E | 27° 39' 12.925" N | 75° 35' 0.010" E |
| F | 27° 40' 36.967" N | 75° 36' 19.040" E |
| G | 27° 41' 12.383" N | 75° 35' 33.360" E |
| H | 27° 41' 59.904" N | 75° 36' 18.925" E |
| I | 27° 41' 37.711" N | 75° 36' 57.423" E |

**Project:-**

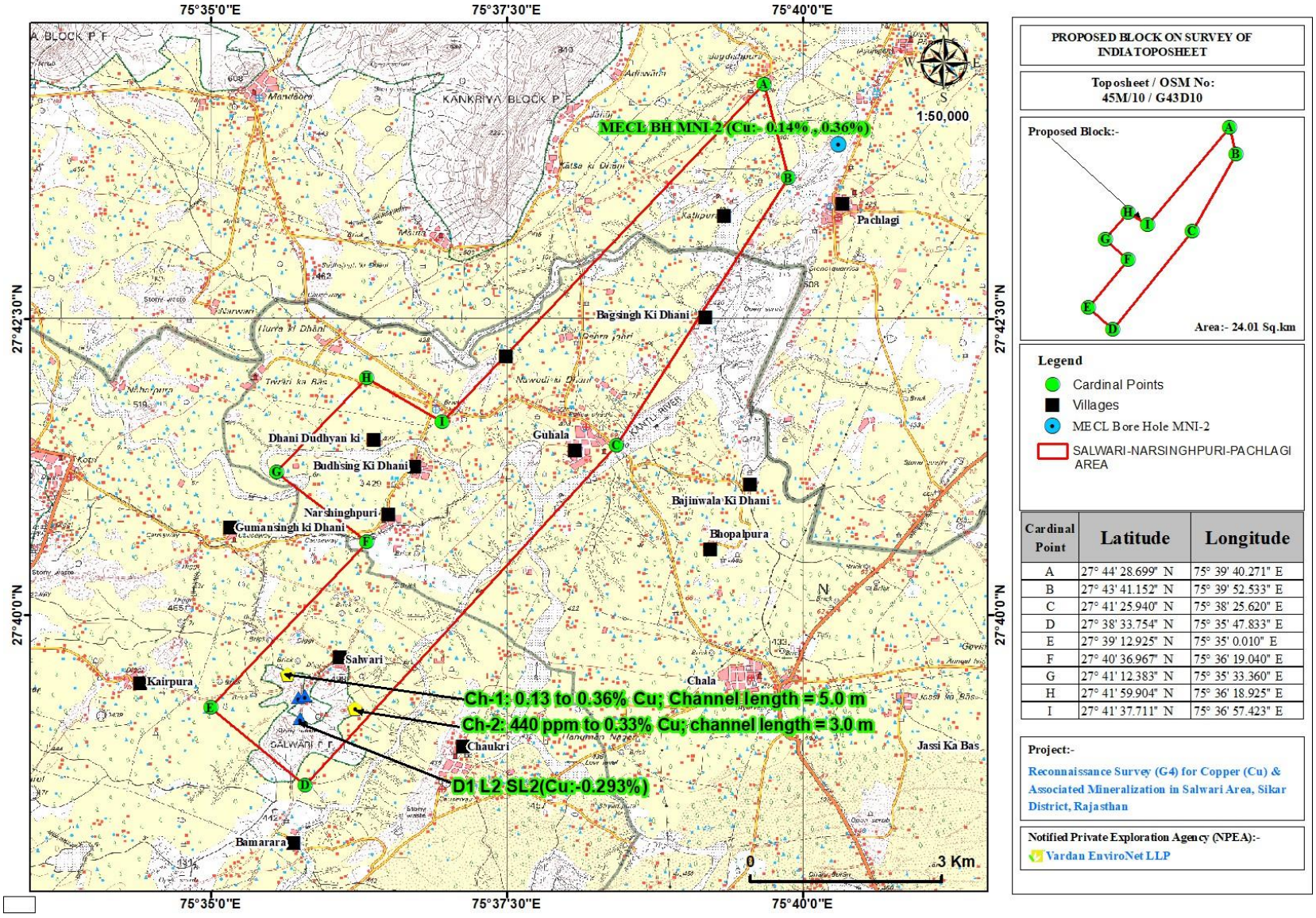
**Reconnaissance Survey (G4) for Copper (Cu) & Associated Mineralization in Salwari Area, Sikar District, Rajasthan**

**Notified Private Exploration Agency (NPEA):-**

**Vardan EnviroNet LLP**

**Scale:-**

# PLATE-III




PROPOSED BLOCK ON SURVEY OF INDIA TOPOSHEET

Toposheet / OSM No:
45M/10 / G43D10

Proposed Block:-




Area:- 24.01 Sq.km

**Legend**

- Cardinal Points
- Villages
- MECL Bore Hole MNI-2
- SALWARI-NARSINGHPURI-PACHLAGI AREA

| Cardinal Point | Latitude | Longitude |
|---|---|---|
| A | 27° 44' 28.699" N | 75° 39' 40.271" E |
| B | 27° 43' 41.152" N | 75° 39' 52.533" E |
| C | 27° 41' 25.940" N | 75° 38' 25.620" E |
| D | 27° 38' 33.754" N | 75° 35' 47.833" E |
| E | 27° 39' 12.925" N | 75° 35' 0.010" E |
| F | 27° 40' 36.967" N | 75° 36' 19.040" E |
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| H | 27° 41' 59.904" N | 75° 36' 18.925" E |
| I | 27° 41' 37.711" N | 75° 36' 57.423" E |

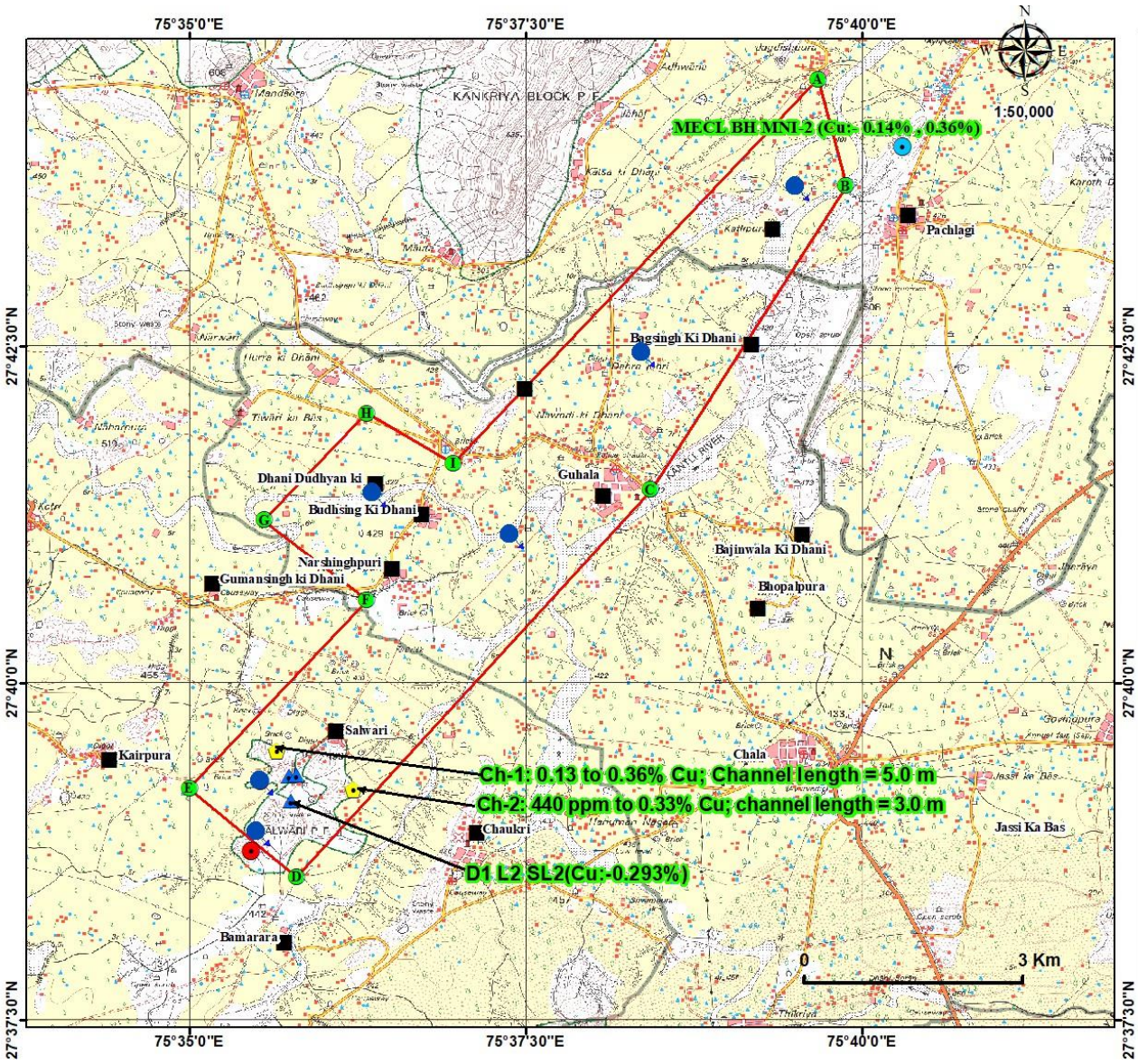
Project:-

Reconnaissance Survey (G4) for Copper (Cu) & Associated Mineralization in Salwari Area, Sikar District, Rajasthan

Notified Private Exploration Agency (NPEA):-

Vardan EnviroNet LLP

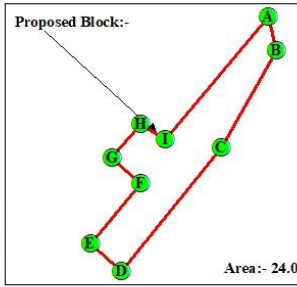
# PLATE-IV




**PROPOSED BLOCK ON SURVEY OF INDIA TOPOSHEET**

**Toposheet / OSM No:**
**45M/10 / G43D10**

**Proposed Block:-**




**Area:- 24.01 Sq.km**

**Legend**

- Cardinal Points
- Villages
- MECL Bore Hole MNI-2
- SALWARI-NARSINGHPURI-PACHLAGI AREA
- Proposed Borehole Locations

| Cardinal Point | Latitude | Longitude |
|---|---|---|
| A | 27° 44' 28.699" N | 75° 39' 40.271" E |
| B | 27° 43' 41.152" N | 75° 39' 52.533" E |
| C | 27° 41' 25.940" N | 75° 38' 25.620" E |
| D | 27° 38' 33.754" N | 75° 35' 47.833" E |
| E | 27° 39' 12.925" N | 75° 35' 0.010" E |
| F | 27° 40' 36.967" N | 75° 36' 19.040" E |
| G | 27° 41' 12.383" N | 75° 35' 33.360" E |
| H | 27° 41' 59.904" N | 75° 36' 18.925" E |
| I | 27° 41' 37.711" N | 75° 36' 57.423" E |

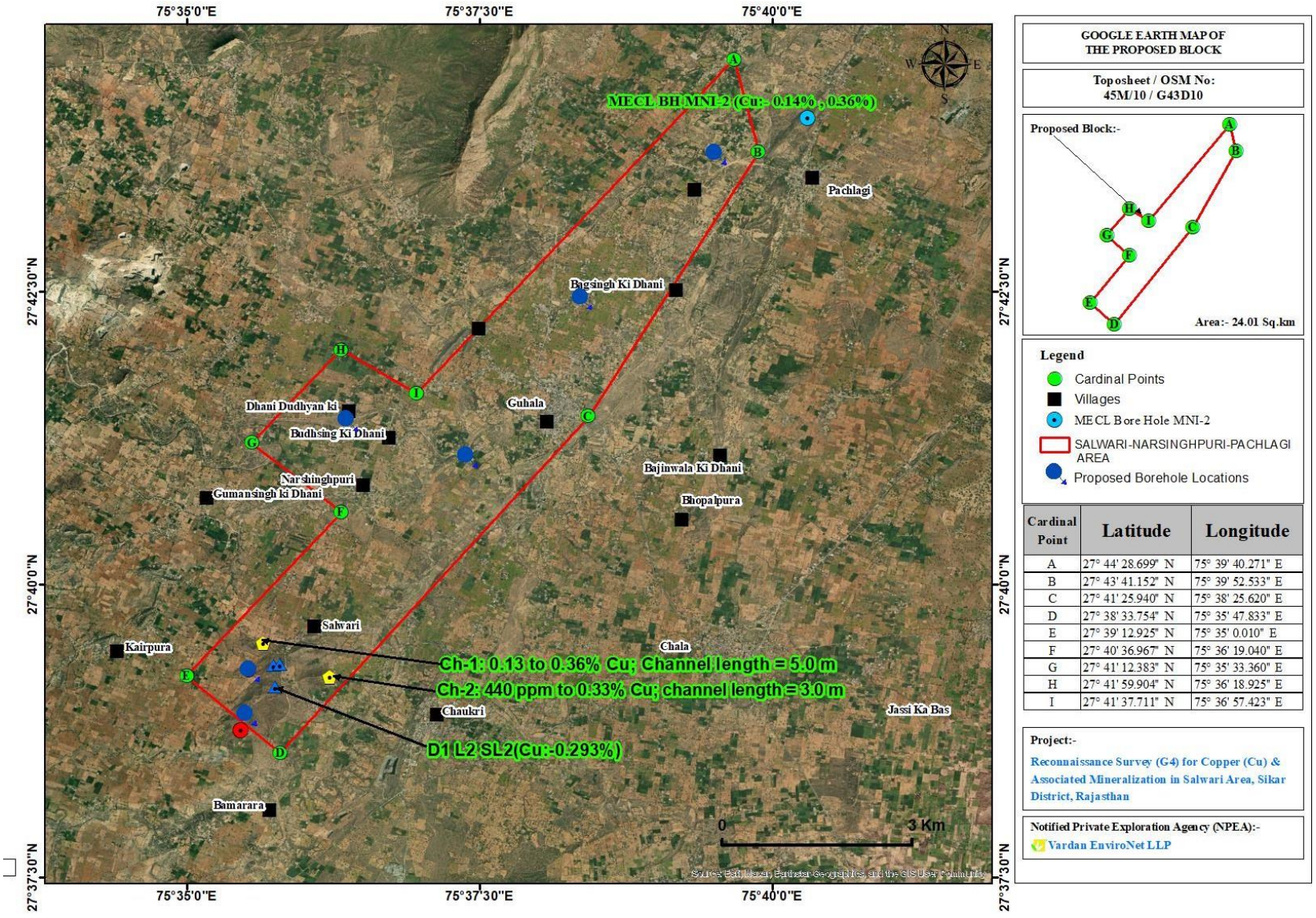
**Project:-**

Reconnaissance Survey (G4) for Copper (Cu) & Associated Mineralization in Salwari Area, Sikar District, Rajasthan

**Notified Private Exploration Agency (NPEA):-**

Vardan EnviroNet LLP

# PLATE-V




**GOOGLE EARTH MAP OF THE PROPOSED BLOCK**

**Toposheet / OSM No: 45M/10 / G43D10**

**Proposed Block:-**




**Legend**

- Cardinal Points
- Villages
- MECL Bore Hole MNI-2
- SALWARI-NARSINGHPURI-PACHLAGI AREA
- Proposed Borehole Locations

| Cardinal Point | Latitude | Longitude |
|---|---|---|
| A | 27° 44' 28.699" N | 75° 39' 40.271" E |
| B | 27° 43' 41.152" N | 75° 39' 52.533" E |
| C | 27° 41' 25.940" N | 75° 38' 25.620" E |
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| I | 27° 41' 37.711" N | 75° 36' 57.423" E |

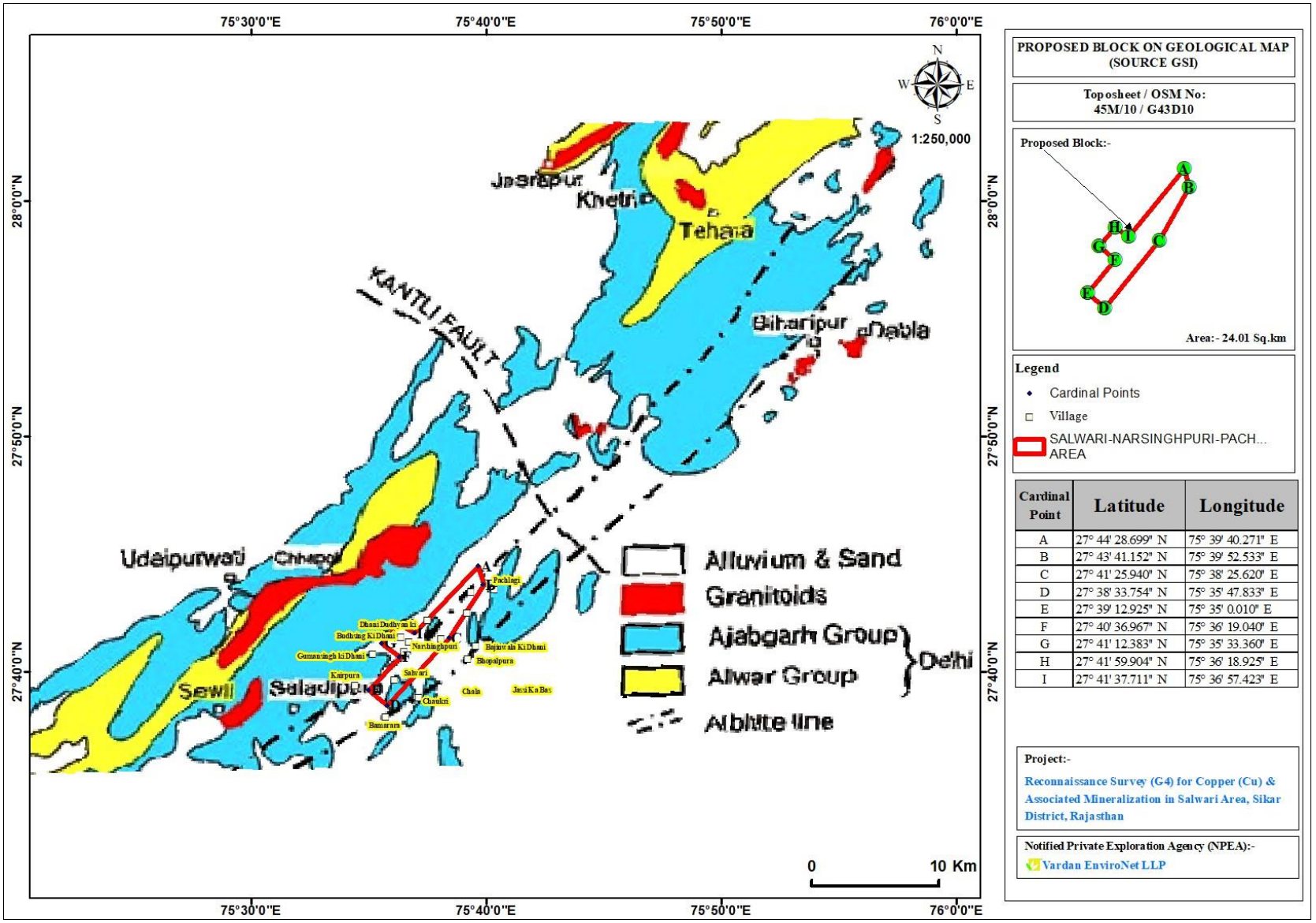
**Project:-**

Reconnaissance Survey (G4) for Copper (Cu) & Associated Mineralization in Salwari Area, Sikar District, Rajasthan

**Notified Private Exploration Agency (NPEA):-**

Vardan EnviroNet LLP

# PLATE-VI




**PROPOSED BLOCK ON GEOLOGICAL MAP (SOURCE GSI)**

**Toposheet / OSM No: 45M/10 / G43D10**

**Proposed Block:-**




**Area:- 24.01 Sq.km**

**Legend**

- Cardinal Points
- Village
- SALWARI-NARSINGHPURI-PACH... AREA

| Cardinal Point | Latitude | Longitude |
|---|---|---|
| A | 27° 44' 28.699" N | 75° 39' 40.271" E |
| B | 27° 43' 41.152" N | 75° 39' 52.533" E |
| C | 27° 41' 25.940" N | 75° 38' 25.620' E |
| D | 27° 38' 33.754" N | 75° 35' 47.833" E |
| E | 27° 39' 12.925" N | 75° 35' 0.010" E |
| F | 27° 40' 36.967" N | 75° 36' 19.040' E |
| G | 27° 41' 12.383" N | 75° 35' 33.360' E |
| H | 27° 41' 59.904" N | 75° 36' 18.925" E |
| I | 27° 41' 37.711" N | 75° 36' 57.423" E |

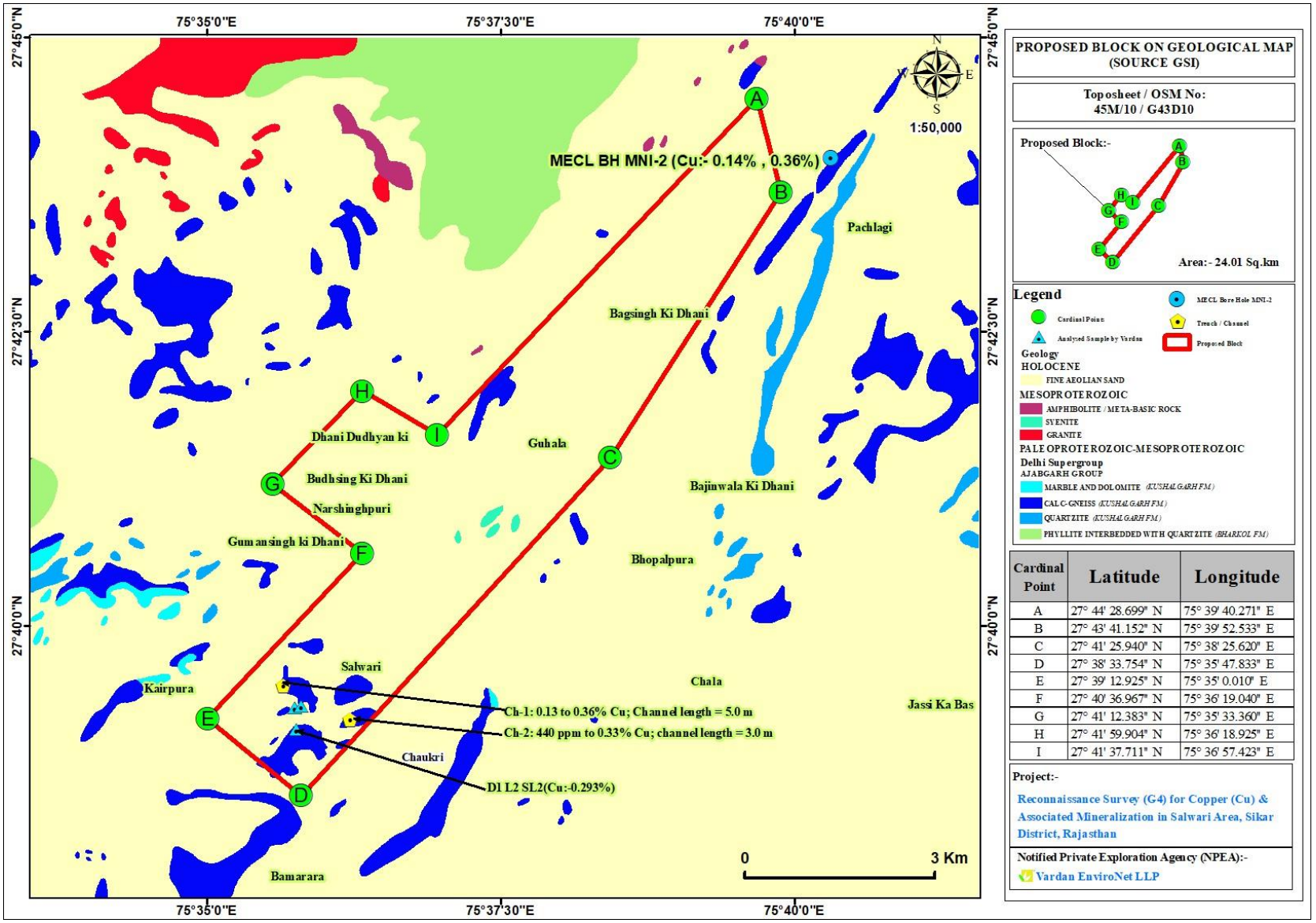
**Project:-**

Reconnaissance Survey (G4) for Copper (Cu) & Associated Mineralization in Salwari Area, Sikar District, Rajasthan

**Notified Private Exploration Agency (NPEA):-**

Vardan EnviroNet LLP

# PLATE-VII




| Cardinal Point | Latitude | Longitude |
|---|---|---|
| A | 27° 44' 28.699" N | 75° 39' 40.271" E |
| B | 27° 43' 41.152" N | 75° 39' 52.533" E |
| C | 27° 41' 25.940" N | 75° 38' 25.620" E |
| D | 27° 38' 33.754" N | 75° 35' 47.833" E |
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| F | 27° 40' 36.967" N | 75° 36' 19.040" E |
| G | 27° 41' 12.383" N | 75° 35' 33.360" E |
| H | 27° 41' 59.904" N | 75° 36' 18.925" E |
| I | 27° 41' 37.711" N | 75° 36' 57.423" E |

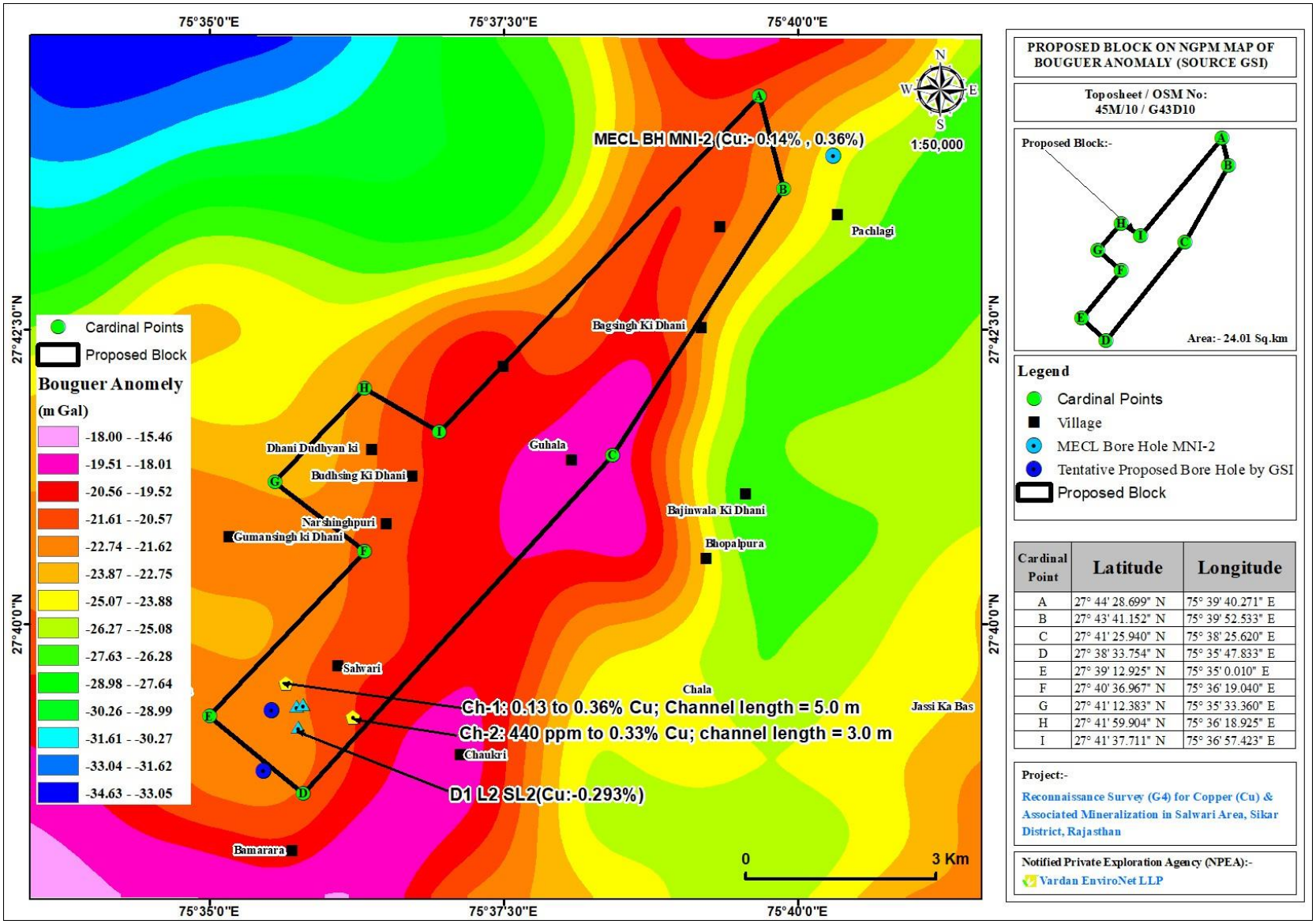
Project:-

Reconnaissance Survey (G4) for Copper (Cu) & Associated Mineralization in Salwari Area, Sikar District, Rajasthan

Notified Private Exploration Agency (NPEA):-

Vardan EnviroNet LLP

# PLATE-VIII




**PROPOSED BLOCK ON NGPM MAP OF BOUGUER ANOMALY (SOURCE GSI)**

**Toposheet / OSM No: 45M/10 / G43D10**




**Legend**

- Cardinal Points
- Village
- MECL Bore Hole MNI-2
- Tentative Proposed Bore Hole by GSI
- Proposed Block

| Cardinal Point | Latitude | Longitude |
|---|---|---|
| A | 27° 44' 28.699" N | 75° 39' 40.271" E |
| B | 27° 43' 41.152" N | 75° 39' 52.533" E |
| C | 27° 41' 25.940" N | 75° 38' 25.620" E |
| D | 27° 38' 33.754" N | 75° 35' 47.833" E |
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| G | 27° 41' 12.383" N | 75° 35' 33.360" E |
| H | 27° 41' 59.904" N | 75° 36' 18.925" E |
| I | 27° 41' 37.711" N | 75° 36' 57.423" E |

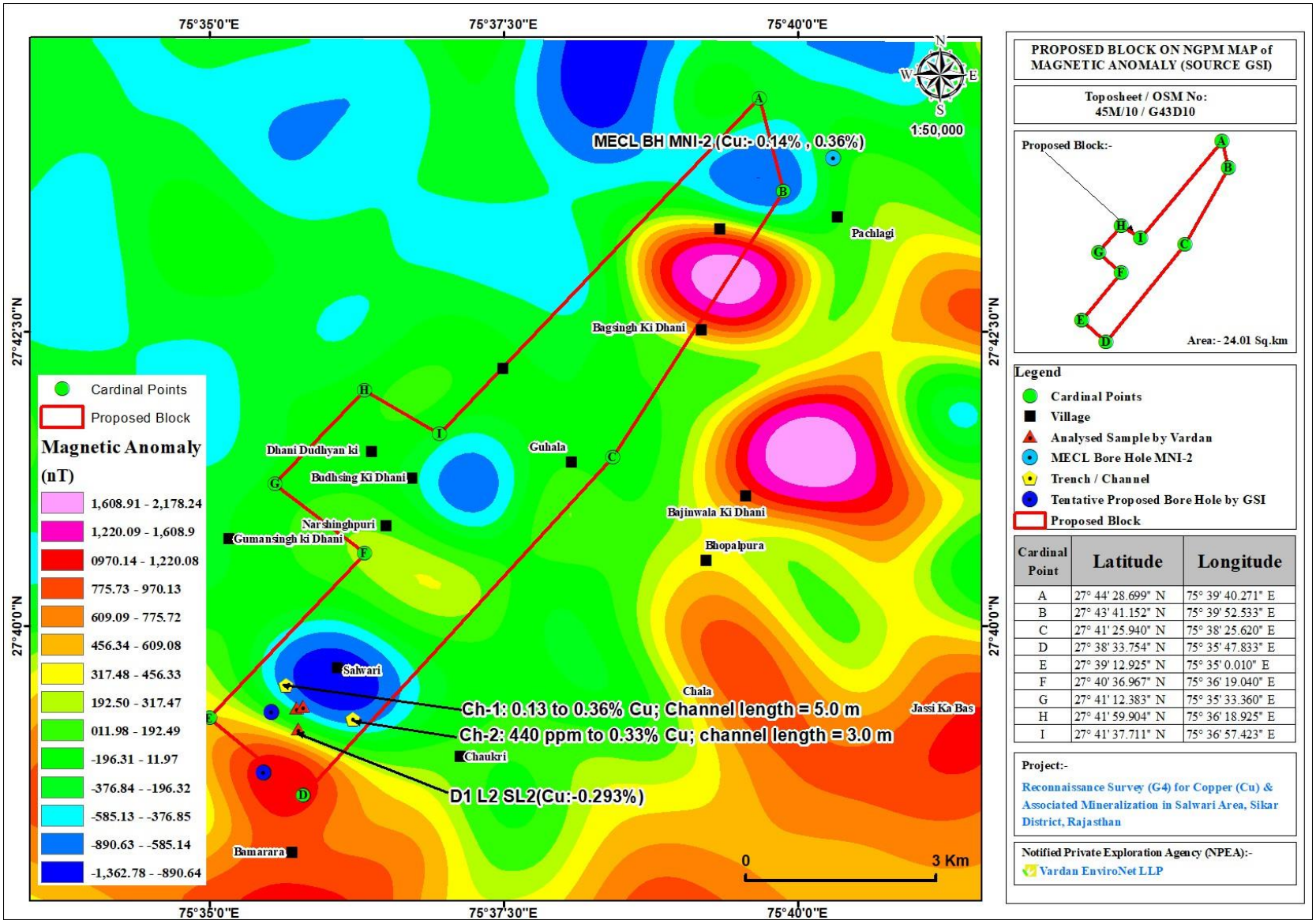
**Project:-**

Reconnaissance Survey (G4) for Copper (Cu) & Associated Mineralization in Salwari Area, Sikar District, Rajasthan

**Notified Private Exploration Agency (NPEA):-**

Vardan EnviroNet LLP

# PLATE-IX




**PROPOSED BLOCK ON NGPM MAP of MAGNETIC ANOMALY (SOURCE GSI)**

**Toposheet / OSM No: 45M/10 / G43D10**

Proposed Block:-

Area:- 24.01 Sq.km

**Legend**

- Cardinal Points
- Village
- Analysed Sample by Vardan
- MECL Bore Hole MNI-2
- Trench / Channel
- Tentative Proposed Bore Hole by GSI
- Proposed Block

| Cardinal Point | Latitude | Longitude |
|---|---|---|
| A | 27° 44' 28.699" N | 75° 39' 40.271" E |
| B | 27° 43' 41.152" N | 75° 39' 52.533" E |
| C | 27° 41' 25.940" N | 75° 38' 25.620" E |
| D | 27° 38' 33.754" N | 75° 35' 47.833" E |
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| G | 27° 41' 12.383" N | 75° 35' 33.360" E |
| H | 27° 41' 59.904" N | 75° 36' 18.925" E |
| I | 27° 41' 37.711" N | 75° 36' 57.423" E |

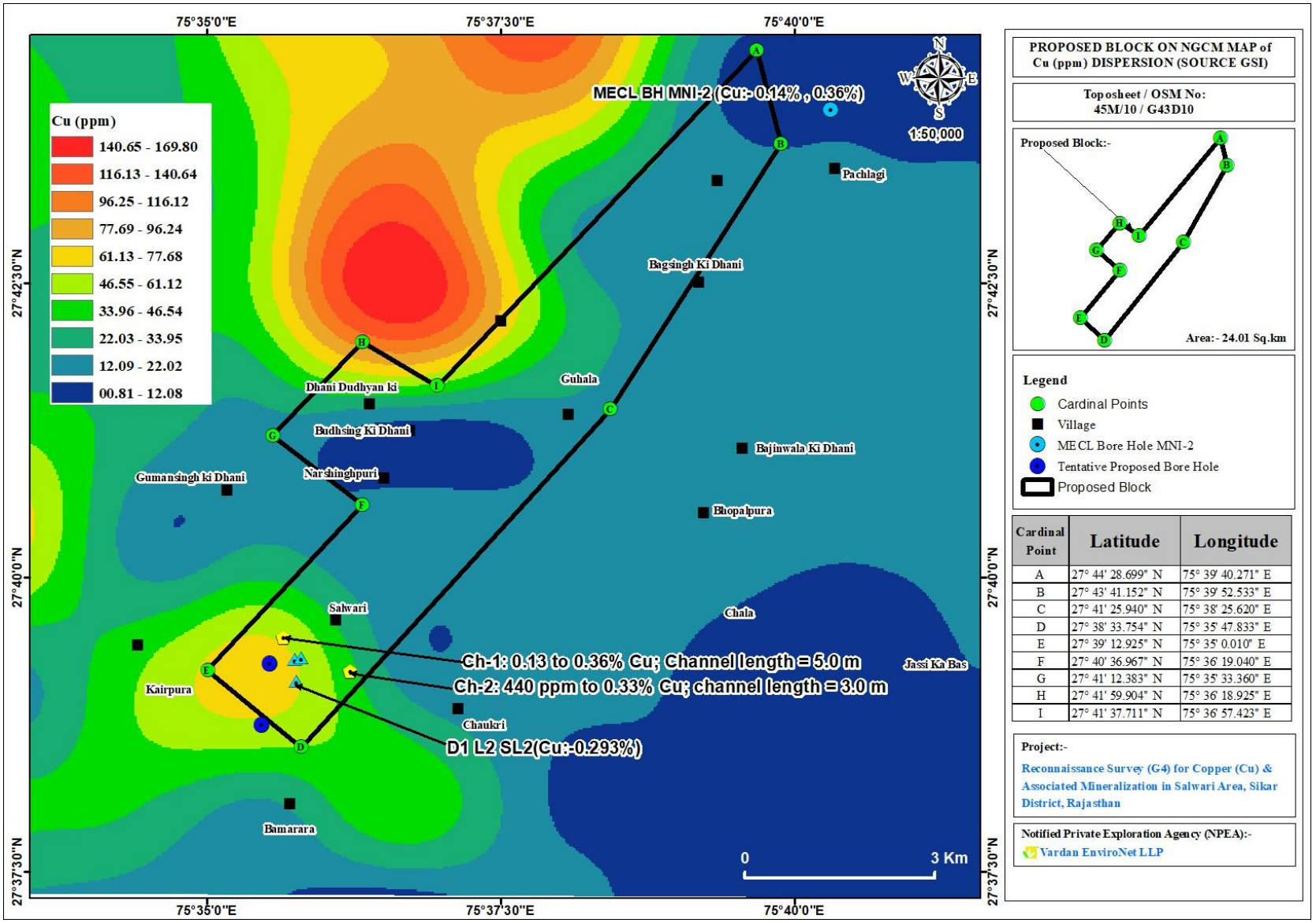
**Project:-**

Reconnaissance Survey (G4) for Copper (Cu) & Associated Mineralization in Salwari Area, Sikar District, Rajasthan

**Notified Private Exploration Agency (NPEA):-**

Vardan EnviroNet LLP

# PLATE-X




**PROPOSED BLOCK ON NGCM MAP of Cu (ppm) DISPERSION (SOURCE GSI)**

**Toposheet / OSM No: 45M/10 / G43D10**

Proposed Block:-




**Legend**

- Cardinal Points
- Village
- MECL Bore Hole MNI-2
- Tentative Proposed Bore Hole
- Proposed Block

| Cardinal Point | Latitude | Longitude |
|---|---|---|
| A | 27° 44' 28.699" N | 75° 39' 40.271" E |
| B | 27° 43' 41.152" N | 75° 39' 52.533" E |
| C | 27° 41' 25.940" N | 75° 38' 25.620" E |
| D | 27° 38' 33.754" N | 75° 35' 47.833" E |
| E | 27° 39' 12.925" N | 75° 35' 0.010" E |
| F | 27° 40' 36.967" N | 75° 36' 19.040" E |
| G | 27° 41' 12.383" N | 75° 35' 33.360" E |
| H | 27° 41' 59.904" N | 75° 36' 18.925" E |
| I | 27° 41' 37.711" N | 75° 36' 57.423" E |

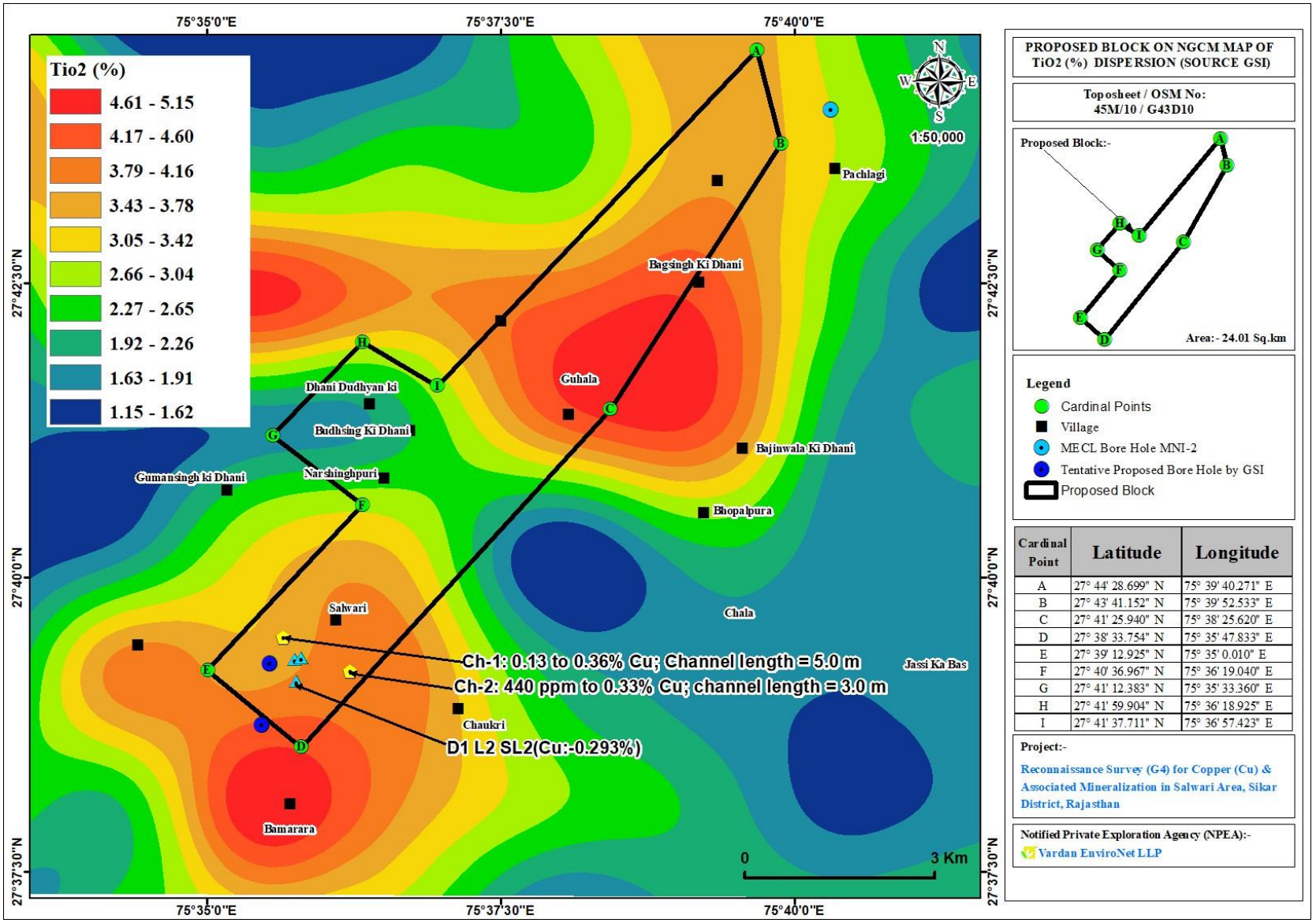
**Project:-**

Reconnaissance Survey (G4) for Copper (Cu) & Associated Mineralization in Salwari Area, Sikar District, Rajasthan

**Notified Private Exploration Agency (NPEA):-**

Vardan EnviroNet LLP

# PLATE-XI




PROPOSED BLOCK ON NGCM MAP OF TiO2 (%) DISPERSION (SOURCE GSI)

Toposheet / OSM No: 45M/10 / G43D10




Legend

- Cardinal Points
- Village
- MECL Bore Hole MNI-2
- Tentative Proposed Bore Hole by GSI
- Proposed Block

| Cardinal Point | Latitude | Longitude |
|---|---|---|
| A | 27° 44' 28.699" N | 75° 39' 40.271" E |
| B | 27° 43' 41.152" N | 75° 39' 52.533" E |
| C | 27° 41' 25.940" N | 75° 38' 25.620" E |
| D | 27° 38' 33.754" N | 75° 35' 47.833" E |
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| G | 27° 41' 12.383" N | 75° 35' 33.360" E |
| H | 27° 41' 59.904" N | 75° 36' 18.925" E |
| I | 27° 41' 37.711" N | 75° 36' 57.423" E |

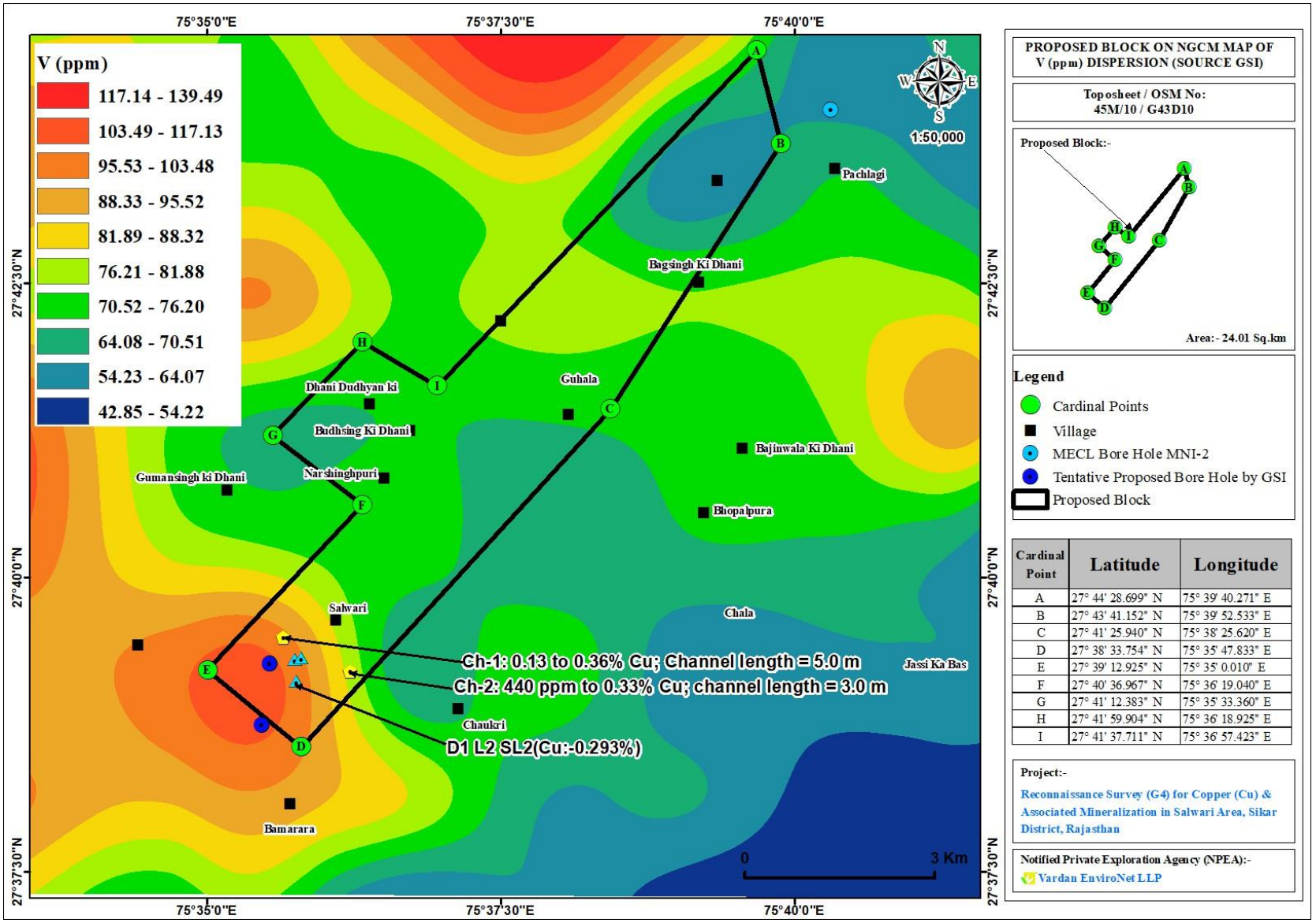
**Project:-**

Reconnaissance Survey (G4) for Copper (Cu) & Associated Mineralization in Salwari Area, Sikar District, Rajasthan

**Notified Private Exploration Agency (NPEA):-**

Vardan EnviroNet LLP

# PLATE-XII




PROPOSED BLOCK ON NGCM MAP OF V (ppm) DISPERSION (SOURCE GSI)

Toposheet / OSM No: 45M/10 / G43D10

Proposed Block:-




Area:- 24.01 Sq.km

**Legend**

- Cardinal Points
- Village
- MECL Bore Hole MNI-2
- Tentative Proposed Bore Hole by GSI
- Proposed Block

| Cardinal Point | Latitude | Longitude |
|---|---|---|
| A | 27° 44' 28.699" N | 75° 39' 40.271" E |
| B | 27° 43' 41.152" N | 75° 39' 52.533" E |
| C | 27° 41' 25.940" N | 75° 38' 25.620" E |
| D | 27° 38' 33.754" N | 75° 35' 47.833" E |
| E | 27° 39' 12.925" N | 75° 35' 0.010" E |
| F | 27° 40' 36.967" N | 75° 36' 19.040" E |
| G | 27° 41' 12.383" N | 75° 35' 33.360" E |
| H | 27° 41' 59.904" N | 75° 36' 18.925" E |
| I | 27° 41' 37.711" N | 75° 36' 57.423" E |

**Project:-**

Reconnaissance Survey (G4) for Copper (Cu) & Associated Mineralization in Salwari Area, Sikar District, Rajasthan

**Notified Private Exploration Agency (NPEA):-**

Vardan EnviroNet LLP