**Designated Officer**
**Ministry of Mines**
**Government of India**
Shastri Bhawan,
New Delhi 110001
Email: do-mom@gov.in

**Date:** 29 November, 2023

## Notice Inviting Tender

**"Invitation of Bids for Grant of Mineral Concession of Critical and Strategic Minerals"**

In exercise of the power of auction conferred by Section 11(D) of the Mines and Minerals (Development and Regulation) Act, 1957 to the Central Government to grant mineral concession for minerals specified in the Part D of the First Schedule and in accordance with the Mineral (Auction) Rules, 2015 as amended from time to time notified thereunder, the Government of India through the Designated Officer, Ministry of Mines has identified **4 Mineral Block for Mining Lease and 16 Mineral Blocks for Composite Licence** for electronic auction and hereby invites tenders for the purposes.

Accordingly, financial bids are invited in digital format only and technical bids are invited both in digital and physical format from eligible bidders.

Eligibility conditions, date and time for participating in the electronic auction are provided in the Tender Document. Detailed Tender Documents along with timelines, notifications, updates and other details for the e-auction process for the mineral blocks are available in electronic form only and can be downloaded from the website of MSTC Limited:(https://www.mstcecommerce.com/auctionhome/mlcl/index.jsp).

Interested and eligible bidders can register themselves on the above website. On successful registration, eligible bidders will obtain login ID and password necessary for participation in the e-auction process. Model Tender Document and Mineral Block Summary are available free of cost on the website of MSTC Limited.

The date for commencement of sale of Tender Document is 29 November, 2023. The last date for purchase of Tender Document after payment of a tender fee on website of e- auction platform provider is 16 January, 2024 on or before 17:00 hours (Indian Standard Time) and the last date for submission of the bid is 22 January, 2024 on or before 17:00 hours (Indian Standard Time).

The Price of Tender Document is Rs. 3,00,000 (Rs. Three Lakhs Only) plus applicable GST. GST is payable under the Reverse Charge Mechanism.

Please find the list of mineral blocks below:

**List of Mineral Blocks for Auction**

| No. | Name of the Block | Mineral | State | ML/ CL | Reserve Price |
|---|---|---|---|---|---|
| 1. | Chutia-Nauhatta Glauconite Block | Glauconite | Bihar | CL | 2.00% |
| 2. | Pipradih-Bhurwa Glauconite Block | Glauconite | Bihar | CL | 2.00% |
| 3. | Genjana Nickel, Chromium and PGE Block | Nickel, Chromium and PGE | Bihar | CL | 2.00% |
| 4. | Kundol Nickel and Chromium Block | Nickel and Chromium | Gujarat | CL | 2.00% |
| 5. | Muskaniya-Gareriatola-Barwari Potash Block | Potash | Jharkhand | CL | 2.00% |
| 6. | Dudhiasol East Nickel and Copper Block | Nickel and Copper | Odisha | ML | 2.00% |
| 7. | Babja Graphite and Manganese Block | Graphite and Manganese Ore | Odisha | ML | 2.00% |
| 8. | Biarpalli Graphite and Manganese Block | Graphite and Manganese | Odisha | ML | 2.00% |
| 9. | Akharkata Graphite Block | Graphite | Odisha | CL | 2.00% |
| 10. | Vellakkal Central (Segment-A) Molybdenum Block | Molybdenum Ore | Tamil Nadu | CL | 2.00% |
| 11. | Nochchipatti Molybdenum Block | Molybdenum Ore | Tamil Nadu | CL | 2.00% |
| 12. | Velampatti North A&B Molybdenum Block | Molybdenum Ore | Tamil Nadu | CL | 2.00% |
| 13. | Kurunjakulam Graphite Block | Graphite | Tamil Nadu | CL | 2.00% |
| 14. | Iluppakudi Graphite Block | Graphite | Tamil Nadu | CL | 2.00% |
| 15. | Mannadipatti Central Molybdenum Block | Molybdenum | Tamil Nadu | CL | 2.00% |
| 16. | Marudipatti (Central) Molybdenum Block | Molybdenum | Tamil Nadu | ML | 2.00% |
| 17. | Kurchha Glauconite Block | Glauconite | Uttar Pradesh | CL | 2.03% |
| 18. | Pahadi Kalan-Gora Kalan Phosphorite Block | Phosphorite | Uttar Pradesh | CL | 2.00% |
| 19. | Salal-Haimna Lithium, Titanium and Bauxite (Aluminous Laterite) Block | Lithium, Titanium and Bauxite (Aluminous Laterite) | UT: Jammu and Kashmir | CL | 2.00% |
| 20. | Katghora Lithium and REE Block | Lithium and REE | Chhattisgarh | CL | 2.00% |

*The Brief details of 20 Blocks of Critical and Strategic Mineral are annexed below.*

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**Ministry of Mines**
**Government of India**

**Summary of the Mineral Block**

**PART A**

**GENERAL INFORMATION ABOUT MINERAL BLOCK**

| | Features | Details |
|---|---|---|
| 1 | **Location** | |
| | Mineral Block | **Chutia-Nauhatta Glauconite Block** |
| i | Location | Block is bounded by,<br>Latitude: N24°32'44.17" to N24°34'2.44",<br>Longitude : E83°44'56.93" to E 83°47'25.38" |
| ii | Corner Points (Latitude,Longitude) | Attached as Annexure-I |
| | Villages | Chutia, Nauhatta |
| | Tehsil/ Taluka | Nauhatta |
| | District | Rohtas |
| | State | Bihar |
| 2 | **Area (hectares)** | |
| | Total Area of Block for Auction | 463.995 Ha |
| | Mineralised Area | - |
| | Non-mineralised area | - |
| 3 | **Exploration** | |
| | Status (G2/ G3/ G4 etc.) | G-3 (Preliminary exploration)<br>(Recommended for Composite License) |
| | Exploration Agency | Geological Survey of India, State Unit- Bihar |
| | Highlights of Geochemical Survey | During the course of present exploration work, 100 Nos. of bed rock samples and 50 Nos. of pit and trench samples were collected from Chutia-Nauhatta area. Glauconitic sandstone yielded maximum 5.37% $K_2O$; welded felsic tuff yielded maximum 5.55% $K_2O$ and fine grained sandstone with shale yielded maximum 5.38% $K_2O$. One of the samples collected from Fawn limestone intercalated with green shale (glauconitic) yielded maximum 11.68% $K_2O$. |
| | Highlights of Mineralogical and Petrographical Studies | Petrographically, glauconitic sandstone is fine to coarse grained and composed of quartz, feldspar, biotite and glauconite pellets. Clasts of quartz and feldspar observed in the section shows sub-angular to sub-rounded in shape. These clasts are embedded in siliceous matrix. Here glauconite occurs as pellets within matrix. |
| | Drilling | 10 Boreholes (Total drilling meterage- 1000 meters) |
| | Borehole Density | 300 m-500 m interval |
| | Trench and Pit | 42 pits and 8 trenches (50 cu.m.) |
| 4 | **Quantity of Minerals (Grade wise)** | |
| | Minerals | Glauconite |
| | Total resource of Glauconite is 141.73 Million Tonnes having average grade of 5.05% at cut-off grade 5% K2O.<br>The above resource is categorized as 333 under United Nation Framework of Classification (UNFC). | |

| | Features | Details |
|---|---|---|
| 5 | **Mineralised Zones** | |
| | Number of Mineral Zones | The cumulative strike length of the mineralized zone is approx. 3.5 Km including soil covered area between two outcrops. |
| | Trend (Dip and Strike) | The attitude of the beds in the sediments is N70°E–S70°W to N80°W–S80°E with gentle dips (10°-45°) towards north and NW direction. |
| | Justification | The exploration work (G3) carried out in the area by means of detailed geological mapping and drilling at 300 m-500 m spacing led to delineation of glauconite mineralised zone for ~4.0 km strike length with estimated resource of 141.73 Million Tonnes having average grade of 5.05% K2O at cut off 5% K2O. Based on the G3 level of exploration carried out in the area, inferred mineral resources have been established. To infer the details of the mining feasibility, detailed exploration is required. Hence block area is recommended for grant of Composite Licence. |
| 6 | **Accessibility** | |
| | Nearest Rail Head | The area is accessible from Dehri-on-Sone railway station (on the Asansol-Mughalsarai Grand Chord Section of the Eastern Railway) by an all-weather metalled road up to Rohtas. The area, west of Chutia, up to the border of Rohtas district (Bihar) and Mirzapur district (U.P.), is approachable from Chutia by a fair-weather road. |
| | Road | |
| | Airport | Gaya Airport |
| 7 | **Hydrography** | |
| | Local Surface Drainage Pattern | The river Son, which flows from west to east forms the main drainage in the area. Most of the feeder nalas which come down across the plateau are seasonal in nature and form huge water-falls during rainy season. The general pattern of the drainage system is dendritic. |
| | Rivers etc | |
| 8 | **Climate** | |
| | Mean Annual Rainfall | 110 cm |
| | Temperature | The plains experience a very hot summer, the maximum temperature sometimes approaching 50°C whereas on the plateau top, the day temperature rarely exceeds 40°C and the nights are pleasant even during the hottest period. |
| | Temperature (June) | |
| 9 | **Topography** | |
| | Toposheet Number | 63P/14 |
| | Morphology of the area | Topographically, the area represents two contrasting domains, viz. the flat alluvial plains in the south and the high Kaimur plateau in the north. The general elevation of the alluvial plains varies from 90m to 140m above the mean sea level (MSL), while the top of the Kaimur plateau ranges in the height from 400m to 500m above the MSL. |

**PART B**

**PARTICULARS OF STATUTORY LICENSE, PERMITS, PERMISSIONS, CONCESSIONS, APPROVALS AND CONSENTS RELATED TO MINING OPERATIONS**

| Sl.No. | Particulars | Details/ Status |
|---|---|---|
| 1 | Forest clearance | To be obtained by the preferred bidder |
| 2 | Wild life clearance (sanctuary, reserve or special zone clearances) | To be obtained by the preferred bidder |
| 3 | Environmental clearance | To be obtained by the preferred bidder |
| 4 | Mining plan approval | To be obtained by the preferred bidder |
| 5 | Consent to establish | To be obtained by the preferred bidder |
| 6 | Explosive license | To be obtained by the preferred bidder |
| 7 | Permission for mine opening | To be obtained by the preferred bidder |
| 8 | Permission of installation/ trial operation of equipment | To be obtained by the preferred bidder |
| 9 | Ground water clearance (Centre/State) | To be obtained by the preferred bidder |
| 10 | Railway siding approval | To be obtained by the preferred bidder |
| 11 | Approval for diesel storage | To be obtained by the preferred bidder |
| 12 | Power line from state Discom | To be obtained by the preferred bidder |
| 13 | Clearances relating to work under an existing transmission line or shifting of the transmission line | To be obtained by the preferred bidder |
| 14 | Grama Sabha consent | To be obtained by the preferred bidder |
| 15 | Any other clearances to start mining operation | To be obtained by the preferred bidder |

**PART C**

**PARTICULARS OF LAND**

| Sl. No. | Land Type | Area (in Hectares) |
|---|---|---|
| 1 | Total Concession Area | 463.995 Ha |
| 2 | Forest Land with Status | - |
| 3 | Government Land with Status | - |
| 4 | Private Land with Status | - |
| 5 | Revenue survey details of the area | - |

**Note:**

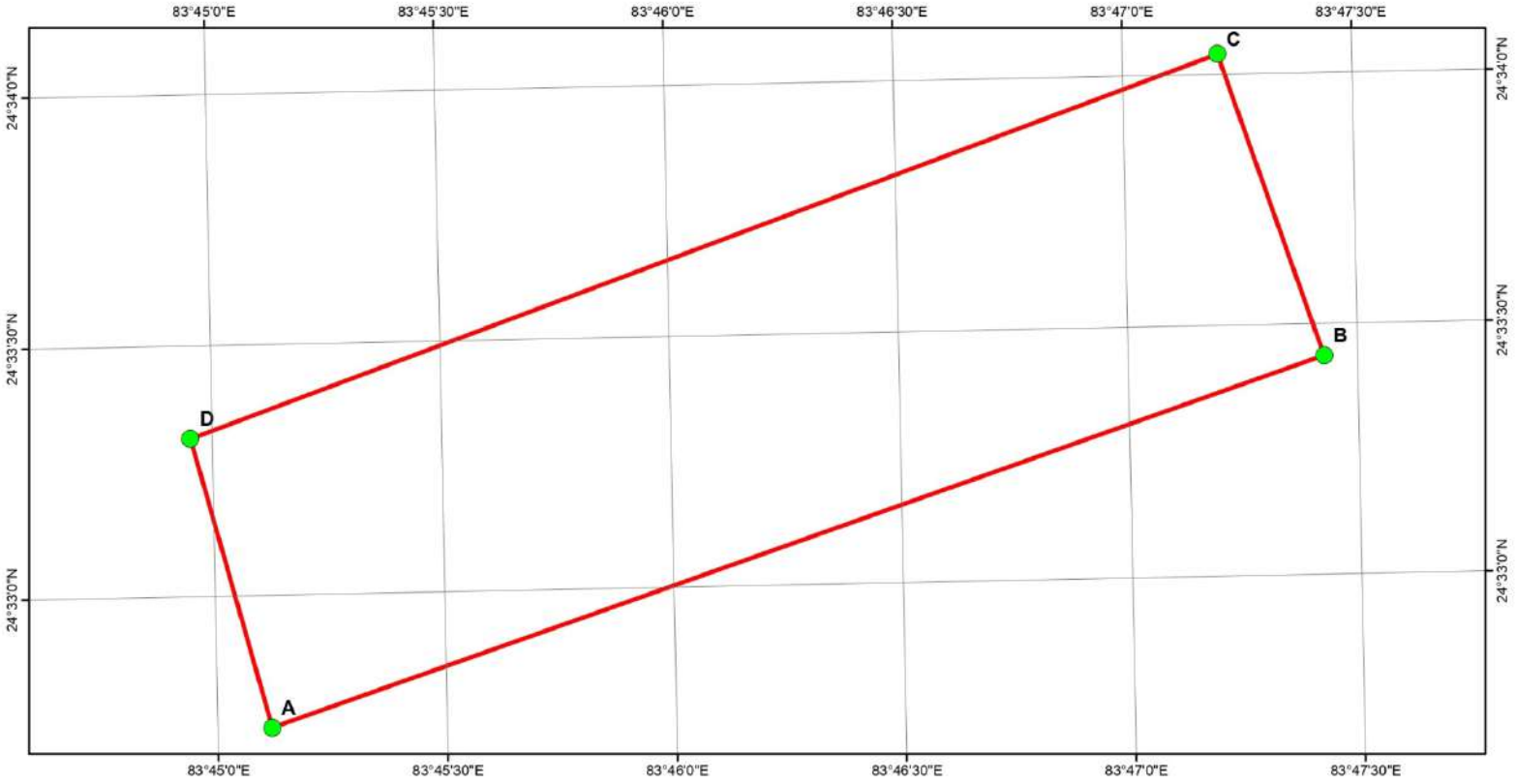
1. Mineral Block Summary has been prepared based on the available data in the Geological Report submitted by the exploration agency.
2. Block area/ Concession area given in the mineral block summary is the calculated area of co-ordinates as provided in the Annexure-I.

**Annexure-I**

**Co-ordinates of Block Boundary Corner Points of Chutia-Nauhatta Glauconite Block**

| Points | Latitude | Longitude |
|---|---|---|
| A | 24°32'44.170" N | 83°45'06.880" E |
| B | 24°33'26.177" N | 83°47'25.384" E |
| C | 24°34'02.443" N | 83°47'12.235" E |
| D | 24°33'18.880" N | 83°44'56.930" E |

Chutia Nauhatta Glauconite Block (463.995), Village: Chutia, Nauhatta, Tehsil: Nauhatta, District: Rohtas, Bihar




| Coordinates of Corner Points of Chutia Nauhatta Glauconite Block, Rohtas District, Bihar | | | |
|---|---|---|---|
| Sl. No. | Points | Latitude | Longitude |
| 1 | A | 24°32'44.170" N | 83°45'06.880" E |
| 2 | B | 24°33'26.177" N | 83°47'25.384" E |
| 3 | C | 24°34'02.443" N | 83°47'12.235" E |
| 4 | D | 24°33'18.880" N | 83°44'56.930" E |

Part of Survey of India Toposheet No. 63P/14

1:15,000

0 0.2 0.4 0.8 1.2 1.6 Kilometers

MECL

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(Formerly Mineral Exploration Corporation Ltd.)

Ministry of Mines, Govt of India Enterprise, MINIRATNA-I CPSE

An ISO 9001:2015, 14001:2015 & 45001:2018 Certified Company

**Summary of the Mineral Block**

**PART A**

**GENERAL INFORMATION ABOUT MINERAL BLOCK**

| | **Features** | **Details** |
|---|---|---|
| 1 | **Location** | |
| | Mineral Block | **Pipradih-Bhurwa Glauconite Block** |
| i | Location | Block is bounded by,<br>Latitude: N 24°33'28.34" to N 24°34'46.11"<br>Longitude: E 83°47'13.28" to E 83°49'30.68" |
| ii | Corner Points (Latitude, Longitude) | Attached as Annexure-I |
| | Villages | Mangardah, Chaphla, Paharia and Banua |
| | Tehsil/ Taluka | Nauhatta |
| | District | Rohtas |
| | State | Bihar |
| 2 | **Area (hectares)** | |
| | Total Area of Block for Auction | 415.38 Ha |
| | Mineralised Area | - |
| | Non-mineralised area | - |
| 3 | **Exploration** | |
| | Status (G2/ G3/ G4 etc.) | G-3 (Preliminary exploration)<br>(Recommended for Composite License) |
| | Exploration Agency | Geological Survey of India, State Unit- Bihar, Eastern Region |
| | Highlights of Geophysical Survey | Geophysical work has not been carried out in the study area; therefore, only integration of geological and geochemical work has been attempted. |
| | Highlights of Geochemical Survey | Analytical result of 25 nos. of bedrock samples reveals that the weight percentage of K2O for 11 nos. samples of sandstone is more than 4 % and for two samples of K2O is more than 5 %, the maximum being 5.13% K2O.<br>A total of 50 cu.m. pitting/ trenching, 48 nos. of pits (PT-1 to 48) of 1cu.m. each and 1 nos. of trench (PB-T1) of 2 cu.m. was excavated in soil covered area to expose the concealed glauconitic sandstone and to collect fresh sample. Samples collected from PT-8, PT-10, PT-12, PT-18 and PT-22 yielded K2O values ranging from 5.02% to 5.31%. |
| | Drilling | 8 Nos of Boreholes (Total drilling meterage-700m),<br>Vertical Boreholes, Core Drill |
| | Borehole Density | 800 m x 400 m grid pattern |
| | Trench and Pit | 48 nos. of pits/trenches (50 cum) |
| 4 | **Quantity of Minerals (Grade wise)** | |
| | Minerals | Glauconite |
| | **Geological Resources** (Inferred Mineral Resource-333) | |
| | The estimated resource of Glauconite is 88.38 Million Tonnes having average grade of 5.26 % | |

| | Features | Details |
|---|---|---|
| | at cut off 5 % K2O and 60.42 Million Tonnes having average grade of 4.28% for 3-5% K2O value. | |
| 5 | **Mineralised Zones** | |
| | Number of Mineral Zones | 4 Mineralised Zones |
| | Trend (Dip and Strike) | The general attitude of the beds in the Vindhyan sediments is N75°E with gentle northerly dip (5° to 10°). |
| | Justification | Keeping in view the grade of ore and thickness of mineralised body, upgradation of exploration to G2-stage of exploration may be taken up to enhance the confidence level of ore resource in future. Hence block is recommended to put in auction for Composite License. |
| 6 | **Accessibility** | |
| | Nearest Rail Head | The nearest railway station Dehri-On-Sone, is located on Asansol-Mughalsarai Grand Chord Section of the Eastern Railway. |
| | Road | Block is located 58 km south-west of Dehri-On-Sone in Rohtas district, Bihar. |
| | Airport | Gaya International Airport |
| 7 | **Hydrography** | |
| | Local Surface Drainage Pattern | - |
| | Rivers etc | |
| 8 | **Climate** | |
| | Mean Annual Rainfall | The average rainfall during the rainy season is about 110 cm. |
| | Temperature | The plains experience a very strong hot summer, the maximum temperature sometimes approaching 50° C whereas on the plateau top the day temperature never exceeds 40°C and the nights are pleasant even during the hottest period. |
| | Temperature (June) | |
| 9 | **Topography** | |
| | Toposheet Number | 63P/14 |
| | Morphology of the area | The study area falls within the open type forest areas which is under the control of Divisional Forest Office, Rohtas district, Bihar. |

**PART B**

**PARTICULARS OF STATUTORY LICENSE, PERMITS, PERMISSIONS, CONCESSIONS, APPROVALS AND CONSENTS RELATED TO MINING OPERATIONS**

| Sl.No. | Particulars | Details/ Status |
|---|---|---|
| 1 | Forest clearance | To be obtained by the preferred bidder |
| 2 | Wild life clearance (sanctuary, reserve or special zone clearances) | To be obtained by the preferred bidder |
| 3 | Environmental clearance | To be obtained by the preferred bidder |
| 4 | Mining plan approval | To be obtained by the preferred bidder |
| 5 | Consent to establish | To be obtained by the preferred bidder |
| 6 | Explosive license | To be obtained by the preferred bidder |
| 7 | Permission for mine opening | To be obtained by the preferred bidder |
| 8 | Permission of installation/ trial operation of equipment | To be obtained by the preferred bidder |
| 9 | Ground water clearance (Centre/State) | To be obtained by the preferred bidder |
| 10 | Railway siding approval | To be obtained by the preferred bidder |
| 11 | Approval for diesel storage | To be obtained by the preferred bidder |
| 12 | Power line from state Discom | To be obtained by the preferred bidder |
| 13 | Clearances relating to work under an existing transmission line or shifting of the transmission line | To be obtained by the preferred bidder |
| 14 | Grama Sabha consent | To be obtained by the preferred bidder |
| 15 | Any other clearances to start mining operation | To be obtained by the preferred bidder |

**PART C**

**PARTICULARS OF LAND**

| Sl. No. | Land Type | Area (in Hectares) |
|---|---|---|
| 1 | Total Concession Area | 415.38 Ha |
| 2 | Forest Land with Status | - |
| 3 | Government Land with Status | - |
| 4 | Private Land with Status | - |
| 5 | Revenue survey details of the area | - |

**Note:**

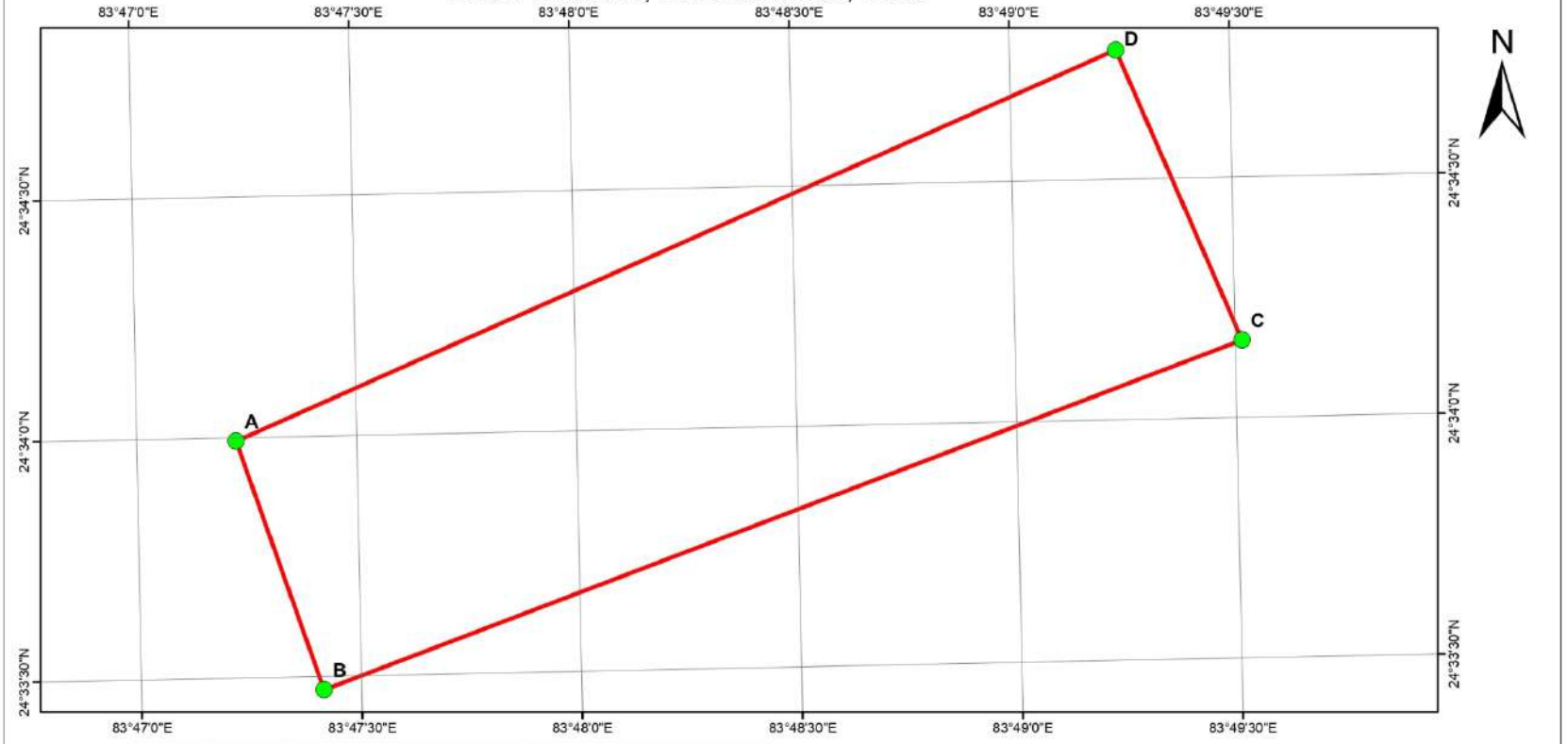
1. Mineral Block Summary has been prepared based on the available data in the Geological Report submitted by the exploration agency.
2. Block area/ Concession area given in the mineral block summary is the calculated area of co-ordinates as provided in the Annexure-I.

**Annexure-I**

**Co-ordinates of Block Boundary Corner Points of Pipradih-Bhurwa Glauconite Block**

| Points | Latitude | Longitude |
|---|---|---|
| A | 24°33'59.560" N | 83°47'13.280" E |
| B | 24°33'28.340" N | 83°47'24.600" E |
| C | 24°34'09.610" N | 83°49'30.680" E |
| D | 24°34'46.110" N | 83°49'14.220" E |

Pipradih Bhurwa Glauconite Block (415.38 ha), Village: Mangardah, Chaphla, Paharia, Banua,
Tehsil: Nauhatta, District: Rohtas, Bihar




| Coordinates of Corner Points of Pipradih Bhurwa Glauconite Block, Rohtas District, Bihar | | | |
|---|---|---|---|
| Sl. No. | Points | Latitude | Longitude |
| 1 | A | 24°33'59.560" N | 83°47'13.280" E |
| 2 | B | 24°33'28.340" N | 83°47'24.600" E |
| 3 | C | 24°34'09.610" N | 83°49'30.680" E |
| 4 | D | 24°34'46.110" N | 83°49'14.220" E |

Part of Survey of India Toposheet No. 63P/14

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0 0.2 0.4 0.8 1.2 1.6 Kilometers

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**Summary of the Mineral Block**

**PART A**

**GENERAL INFORMATION ABOUT MINERAL BLOCK**

| | **Features** | **Details** |
|---|---|---|
| 1 | **Location** | |
| | Mineral Block | **Genjana Nickel, Chromium and PGE Block** |
| i | Location | Block is bounded by,<br>Latitude: 24°30'00" N to 24°30'55" N<br>Longitude: 84°34'32" E to 84°37'18" E |
| ii | Corner Points (Latitude,Longitude) | Attached as Annexure-I |
| | Villages | Genjana, Lakrahi |
| | Tehsil/ Taluka | Banke Bazar |
| | District | Gaya |
| | State | Bihar |
| 2 | **Area (hectares)** | |
| | Total Area of Block for Auction | 788.85 Ha |
| | Mineralised Area | - |
| | Non-mineralised area | - |
| 3 | **Exploration** | |
| | Status (G2/ G3/ G4 etc.) | G-4 ( Reconnaissance Survey)<br>(Recommended for Composite License) |
| | Exploration Agency | Geological Survey of India, State Unit- Bihar, Eastern Region, Patna |
| | Highlights of Geochemical Survey | In the Genjana block, three trench samples taken at 1m interval from the meta-pyroxenite body demarcated at Lakrahi has shown Pt+Pd value of 668ppb, 309ppb and 260ppb which is a promising value. The bedrock samples from the same body have yielded Cr content from 1619ppm to 3119ppm and Ni content from 629ppm to 1518ppm. Similarly, in the Masuribad block, the ultramafic body delineated at, Sukradih, south of Masuribad, NE of Baratand, NW of Goritta and SW of Malahwadih have shown peak value of 179ppb, 161ppb, 290ppb and 189ppb respectively. The Cr value ranges from 5- 3006ppm and Ni content of 24-1478ppm in the bedrock samples of this block.<br>The high Mg containing rocks observed in the area are invariably associated with PGE mineralization. |
| | Drilling | Drilling not carried out. |
| | Borehole Density | Drilling not carried out. |
| | Trench and Pit | 10 nos of trenching (55 cu m) |

| | Features | Details |
|---|---|---|
| 4 | **Resources and Grade of Mineral** | |
| | Minerals | Nickel, Chromium and PGE |
| | Resources not estimated. | |
| 5 | **Mineralised Zones** | |
| | Number of Mineral Zones | One |
| | Trend (Dip and Strike) | The strike of the bedding plane generally trends N70°E-S70°W with steep to vertical dip on either side. |
| | Mineralization | The most promising mineralized zone has been delineated in the Genjana block at north of Lakrahi having strike length of 1km trending almost E-W and width varies from 12m to 40m where the PGE mineralization is restricted to a particular cycle of ultramafics mostly within meta-pyroxenite which is in near contact with gabbroic mass. The enrichment of Pt+Pd is associated with the light green metapyroxenite and the mixed zone having gabbro interbanded with light green metapyroxenite. PGE mineralisation is being reported for the first time in the investigation area. A total of six maficultramfic bodies out of total 14 mapped in the area have shown PGE enrichment. The PGE mineralization is of PPGE type in Genjana block The Genjana block is the most promising area having maximum exposure of mafic-ultramafic rocks. |
| | Justification | In the Genjana block, three trench samples taken at 1m interval from the meta-pyroxenite body demarcated at Lakrahi has shown Pt+Pd value of 668ppb, 309ppb and 260ppb which is a promising value. The bedrock samples from the same body have yielded Cr content from 1619ppm to 3119ppm and Ni content from 629ppm to 1518ppm.<br>As per the data available in the report, it is reported the presence of Nickel, Chromium and PGE mineralization in the block area. The block may be recommended for putting for auction of composite license (CL) for up-gradation of level of exploration to assess the full economic potentiality of the Nickel, Chromium and PGE mineralization in the block. |
| 6 | **Accessibility** | |
| | Nearest Rail Head | Gaya |
| | Road | The area is easily accessible by road. The Grand Trunk (G.T) Road (NH 2) passes through the area. A metalled road connecting Sherghati on the G.T. Road and Imamganj runs across the southeastern part of the study area via Bankebazar. Another road from Mahapur on the G.T. Road runs southward through the valley portion and connects Bankebazar. In addition to these two roads, the area is traversed by a number of unmetalled roads and foot tracks. |
| | Airport | Gaya Airport |
| 7 | **Hydrography** | |

| | Features | Details |
|---|---|---|
| | Local Surface Drainage Pattern | In the hilly region, the drainage pattern is dendritic and sometimes trellis, being controlled by the structurally weak planes. The east-west trending hill-range of the area acts as a watershed between Morhar and North Kol river basins. |
| | Rivers etc | |
| 8 | **Climate** | |
| | Mean Annual Rainfall | Low to moderate rainfall is recorded during the monsoon which recedes from the area in late September. |
| | Temperature | The temperatures vary from $9^0$C in the winters to $44^0$C in the summers. |
| | Temperature (June) | |
| 9 | **Topography** | |
| | Toposheet Number | 72D/10 |
| | Morphology of the area | The topography of the area is a combination of rugged hills and flat country which is covered by paddy fields and dotted with villages. |

**PART B**

**PARTICULARS OF STATUTORY LICENSE, PERMITS, PERMISSIONS, CONCESSIONS, APPROVALS AND CONSENTS RELATED TO MINING OPERATIONS**

| Sl.No. | Particulars | Details/ Status |
|---|---|---|
| 1 | Forest clearance | To be obtained by the preferred bidder |
| 2 | Wild life clearance (sanctuary, reserve or special zone clearances) | To be obtained by the preferred bidder |
| 3 | Environmental clearance | To be obtained by the preferred bidder |
| 4 | Mining plan approval | To be obtained by the preferred bidder |
| 5 | Consent to establish | To be obtained by the preferred bidder |
| 6 | Explosive license | To be obtained by the preferred bidder |
| 7 | Permission for mine opening | To be obtained by the preferred bidder |
| 8 | Permission of installation/ trial operation of equipment | To be obtained by the preferred bidder |
| 9 | Ground water clearance (Centre/State) | To be obtained by the preferred bidder |
| 10 | Railway siding approval | To be obtained by the preferred bidder |
| 11 | Approval for diesel storage | To be obtained by the preferred bidder |
| 12 | Power line from state Discom | To be obtained by the preferred bidder |
| 13 | Clearances relating to work under an existing transmission line or shifting of the transmission line | To be obtained by the preferred bidder |
| 14 | Grama Sabha consent | To be obtained by the preferred bidder |
| 15 | Any other clearances to start mining operation | To be obtained by the preferred bidder |

**PART C**

**PARTICULARS OF LAND**

| Sl. No. | Land Type | Area (in Hectares) |
|---|---|---|
| 1 | Total Concession Area | 788.85 Ha |
| 2 | Forest Land with Status | 643.049 Ha (As per PM Gatishakti Portal) |
| 3 | Government Land with Status | - |
| 4 | Private Land with Status | - |
| 5 | Revenue survey details of the area | - |

**Note:**

1. Mineral Block Summary has been prepared based on the available data in the Geological Memorandum (ER_BR_03_Block-1-Genjana) Geological Report submitted by the exploration agency.
2. Co-ordinate of the block boundary has been considered from the Geological Memorandum.
3. Block area/ Concession area given in the mineral block summary is the calculated area of co-ordinates as provided in the Annexure-I.

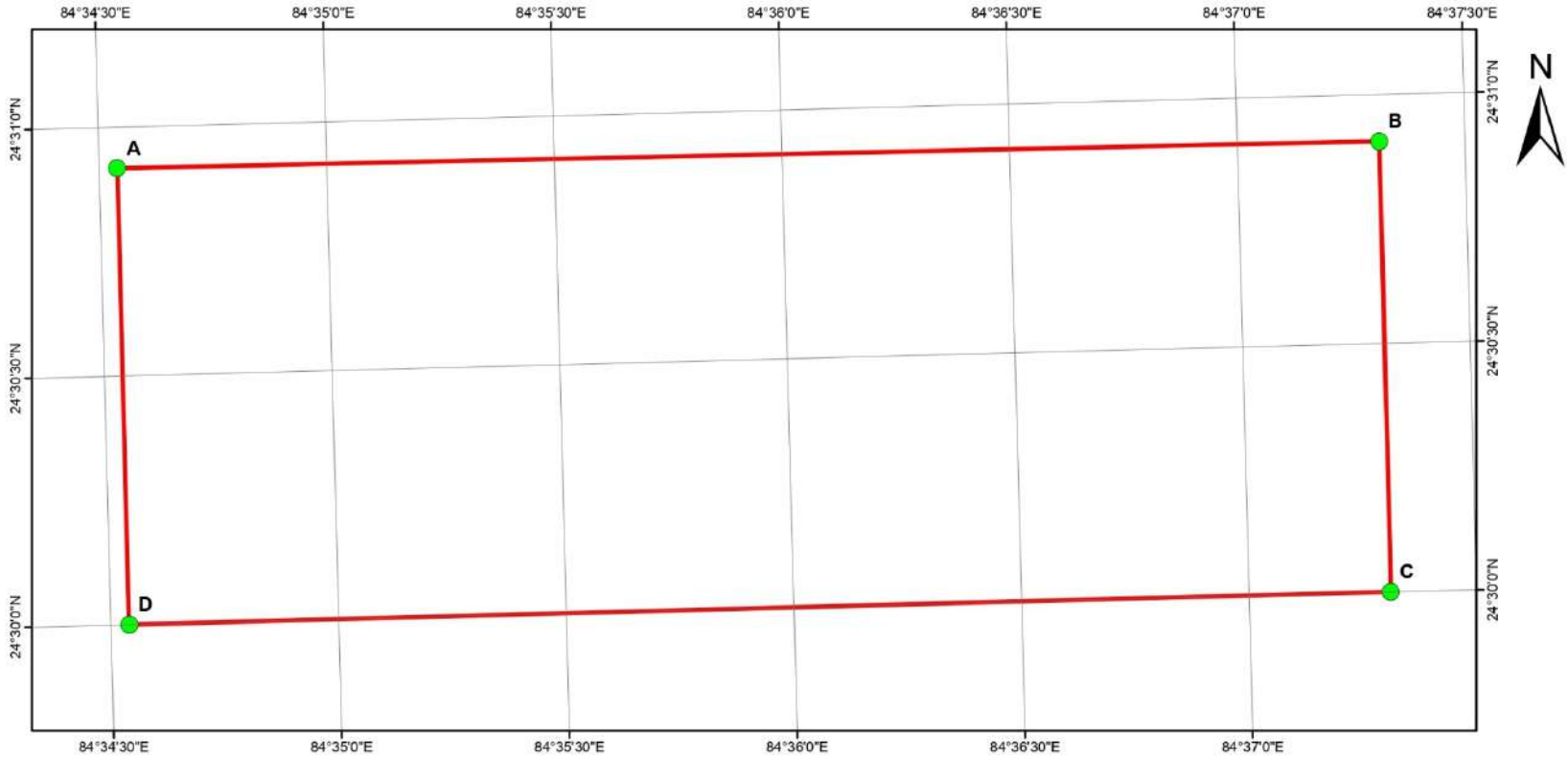
***

**Annexure-I**

**Co-ordinates of Block Boundary of Genjana Nickel, Chromium and PGE Block**

| Point | Latitude | Longitude |
|---|---|---|
| A | 24°30'55.08" N | 84°34'32.16" E |
| B | 24°30'54.36" N | 84°37'18.48" E |
| C | 24°30'00" N | 84°37'18.48" E |
| D | 24°30'00" N | 84°34'32.16" E |

## Genjana Ni, Cr & PGE Block (788.85 ha), Village: Genjana, Lakrahi, District: Gaya and Aurangabad, Bihar




| Coordinates of Corner Points of Genjana Ni, Cr & PGE Block, Gaya and Aurangabad District, Bihar | | | |
|---|---|---|---|
| Sl. No. | Points | Latitude | Longitude |
| 1 | A | 24°30'55.08" N | 84°34'32.16" E |
| 2 | B | 24°30'54.36" N | 84°37'18.48" E |
| 3 | C | 24°30'00" N | 84°37'18.48" E |
| 4 | D | 24°30'00" N | 84°34'32.16" E |

Part of Survey of India Toposheet No. 72D/10

1:15,000

0 0.2 0.4 0.8 1.2 1.6 Kilometers

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**Summary of the Mineral Block**

**PART A**

**GENERAL INFORMATION ABOUT MINERAL BLOCK**

| | **Features** | **Details** |
|---|---|---|
| 1 | **Location** | |
| | Mineral Block | **Kundol Nickel and Chromium Block** |
| i | Location | Block is bounded by,<br>Latitude: 23°51'09" N to 23°52'16" N<br>Longitude: 73°19'16" E to 73°21'31" E |
| ii | Corner Points (Latitude,Longitude) | Attached as Annexure-1 |
| | Villages | Kundol, Jhanjhari & Masota |
| | Tehsil/ Taluka | Bhiloda |
| | District | Aravalli |
| | State | Gujarat |
| 2 | **Area (hectares)** | |
| | Total Area of Block for Auction | 547.80 Ha |
| | Mineralised Area | - |
| | Non-mineralised area | - |
| 3 | **Exploration** | |
| | Status (G2/ G3/ G4 etc.) | G-4 ( Reconnaissance Survey)<br>(Recommended for Composite License) |
| | Exploration Agency | Geological Survey of India, State Unit- Gujarat, Western Region, Gandhinagar |
| | Highlights of Geochemical Survey | Pitting trenching samples of ultra-mafic and associated rocks shows Ni concentration 73 to 5089 ppm, Cr values range 518 to 12,221 ppm. Out of 25 PTS samples 8 sample shows more than 1500 ppm value of Ni with maximum of 5089 ppm and 07 samples shows more than values of 2000 ppm with maximum of 12,221 ppm.<br>In 113 numbers of Bed Rock samples, Ni value ranges from 2 to 3566 ppm, Cr ranges from 63 to 5402 ppm. Out of 113 samples of altered and metamorphosed ultra-mafic, 37 samples (average 2405 ppm) show more than 1500 ppm of Ni and 35 samples (average 3155 ppm) show more than 2000 ppm of Cr. |
| | Highlights of Petrological and XRD Studies | Petrographic study indicated that mostly the altered ultramafic rocks of the Kundol, Masota and Bhanmer area consist of mainly peridotite showing mesh texture by olivine and pyroxene due to serpentinization process of olivine and pyroxene. |

| | Features | Details |
|---|---|---|
| | | In thin sections, fibrous or flaky crystals chrysotile along with some antigorite, chlorite and carbonate minerals are identified in serpentinite with prismatic laths type crystals. Magnetite and other opaque minerals also occur in granular form.<br>XRD analysis shows that Magnesio-hornblende identified as major mineral phase in samples, it may alters easily to chlorite and epidote fraction. Clinochlore (Mg5Al (AlSi3O10) (OH) 8) is the trioctahedral magnesium end member of the chlorite group. Cr replaces Al in the R3+ site whereas Ni replaces Mn in the R2+ site of Clinochlore which is the reason for higher values of Cr and Ni in these rocks. Cr can also replace in the lattice of magnetite, but majority is in the Clinochlore. |
| | Drilling | Drilling not carried out. |
| | Borehole Density | Drilling not carried out. |
| | Trench and Pit | 2 nos of pits and 04 nos of trenches |
| 4 | **Resources and Grade of Mineral** | |
| | Minerals | Nickel and Chromium |
| | Resources not estimated. | |
| 5 | **Mineralised Zones** | |
| | Number of Mineral Zones | - |
| | Nature and Extent of Mineralisation | The altered metamorphosed ultramafic bodies, i.e. Serpentine bearing rocks such as peridotite (potential zone for Ni and Cr mineralisation) occur as irregular lensoidal body along the S2 (NE-SW) foliation planes developed in the country rock (garnetiferous mica schist). |
| | Trend (Dip and Strike) | The general trend of Aravalli Supergroup of rocks (quartzite and garnetiferous mica schist) is NNE-SSW to NE-SW in the study area. |
| | Justification | Serpentine asbestos/chrysotile asbestos occurs in serpentine bearing rocks such as peridotite (potential zone for the Ni and Cr mineralisation) which are altered in the study area and also occurs as cross-fibre. Amphibole asbestos occurs as mass radiating needle shape fibre with talc tremolite schist & actinolite schist. In the EPMA study (BSE images) disseminated type of chromite grains are observed in the talc tremolite actinolite schist, hence the lithologies of the area (talc-tremolite schist, amphibolite and serpentinite) exposed as irregular patches/lenses in the garnetiferous mica schist may host chromite mineralization.<br>As per the data available in the report, it is reported the presence of Nickel and Chromium mineralization in the block area. The block may be recommended for putting for auction of composite license (CL) for up-gradation of level of exploration to assess the full economic potentiality of the Nickel and Chromium mineralization in the block. |

| | Features | Details |
|---|---|---|
| 6 | **Accessibility** | |
| | Nearest Rail Head | Arvalli(Modasa) lies on the Western Railway network of the Indian railways. |
| | Road | Bhiloda taluka is well connected by roads to Idar, Himmatnagar and Shamlaji. Bhiloda taluka is 110 km away from headquarter Gandhinagar and 50 Km away from Himmatnagar. Most of the villages are connected by network of metalled road to all the interior part of the area. |
| | Airport | Ahmedabad |
| 7 | **Hydrography** | |
| | Local Surface Drainage Pattern | The drainage density of the area is low and mostly shows dendritic drainage pattern. In the west the drainage is controlled by the south westerly flowing Hathmati river with its main tributaries the Hamav nadi and other nalas. |
| | Rivers etc | |
| 8 | **Climate** | |
| | Mean Annual Rainfall | 825 mm |
| | Temperature | The weather at Bhiloda taluka is hot to severely hot from March to June when the maximum temperature stays in the range of 32° to 42°C, and the minimum in the range of 20° to 27°C during November to February. |
| | Temperature (June) | |
| 9 | **Topography** | |
| | Toposheet Number | 46 E/5 |
| | Morphology of the area | The overall Physiography of the area is characterized by the undulatory rugged topography with linear ridges. Major part of the area is controlled by structural lineaments. Structural lineaments trend in N-S or NE-SW direction |

**PART B**

**PARTICULARS OF STATUTORY LICENSE, PERMITS, PERMISSIONS, CONCESSIONS, APPROVALS AND CONSENTS RELATED TO MINING OPERATIONS**

| Sl.No. | Particulars | Details/ Status |
|---|---|---|
| 1 | Forest clearance | To be obtained by the preferred bidder |
| 2 | Wild life clearance (sanctuary, reserve or special zone clearances) | To be obtained by the preferred bidder |
| 3 | Environmental clearance | To be obtained by the preferred bidder |
| 4 | Mining plan approval | To be obtained by the preferred bidder |
| 5 | Consent to establish | To be obtained by the preferred bidder |
| 6 | Explosive license | To be obtained by the preferred bidder |
| 7 | Permission for mine opening | To be obtained by the preferred bidder |
| 8 | Permission of installation/ trial operation of equipment | To be obtained by the preferred bidder |
| 9 | Ground water clearance (Centre/State) | To be obtained by the preferred bidder |
| 10 | Railway siding approval | To be obtained by the preferred bidder |
| 11 | Approval for diesel storage | To be obtained by the preferred bidder |
| 12 | Power line from state Discom | To be obtained by the preferred bidder |
| 13 | Clearances relating to work under an existing transmission line or shifting of the transmission line | To be obtained by the preferred bidder |
| 14 | Grama Sabha consent | To be obtained by the preferred bidder |
| 15 | Any other clearances to start mining operation | To be obtained by the preferred bidder |

**PART C**

**PARTICULARS OF LAND**

| Sl. No. | Land Type | Area (in Hectares) |
|---|---|---|
| 1 | Total Concession Area | 547.80 Ha |
| 2 | Forest Land with Status | 241.985 Ha (As per PM Gatishakti Portal) |
| 3 | Government Land with Status | - |
| 4 | Private Land with Status | - |
| 5 | Revenue survey details of the area | - |

**Note:**

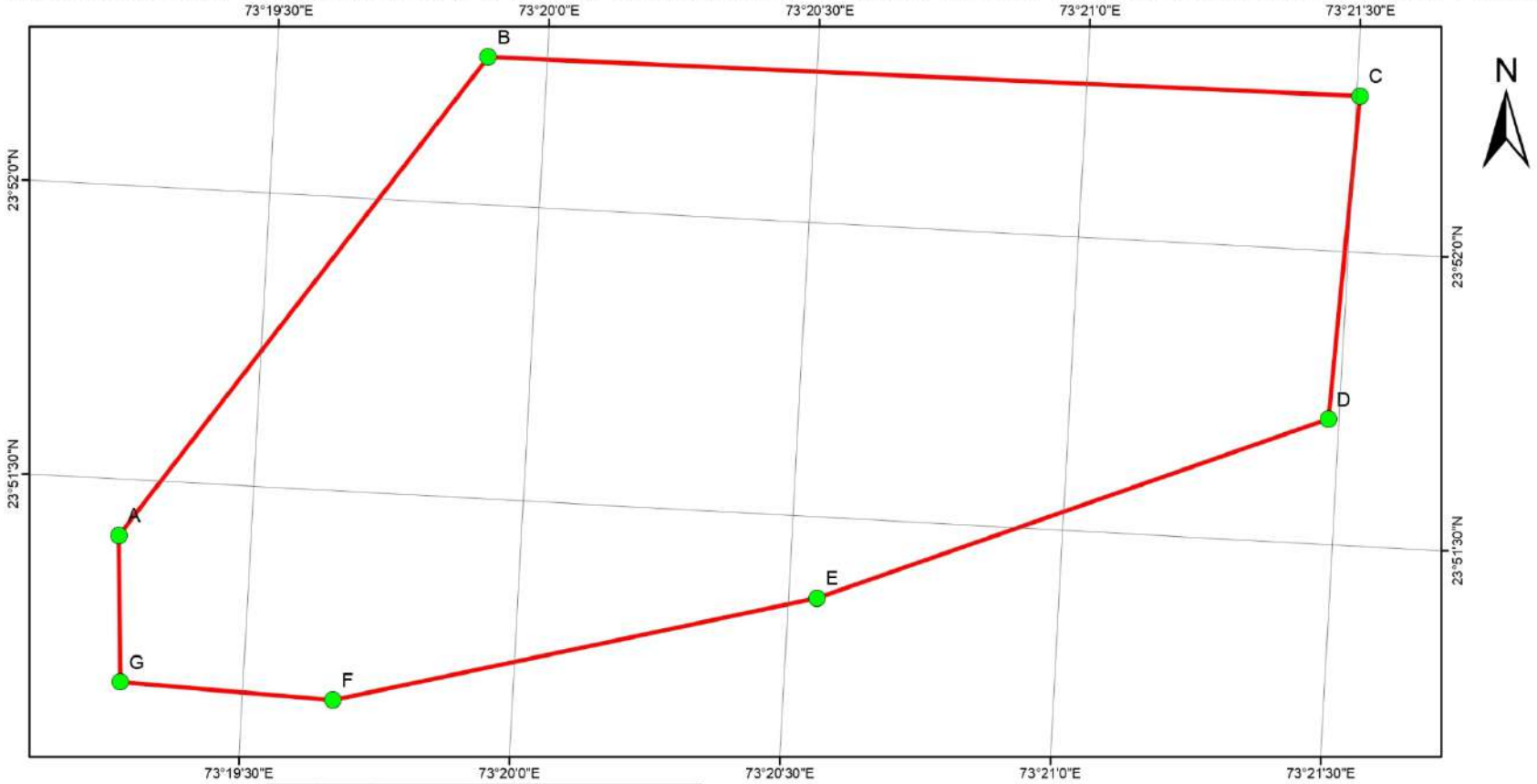
1. Mineral Block Summary has been prepared based on the available data in the Geological Memorandum (WR_GJ_03_Kundol_III) Geological Report submitted by the exploration agency.
2. Co-ordinate of the block boundary has been considered from the Geological Memorandum.
3. Block area/ Concession area given in the mineral block summary is the calculated area of co-ordinates as provided in the Annexure-I.

**Annexure-1**

**Co-ordinates of Block Boundary Corner Point of Kundol Nickel and Chromium Block**

| Point | Latitude | Longitude |
|---|---|---|
| A | 23°51'24" N | 73°19'16" E |
| B | 23°52'15" N | 73°19'54" E |
| C | 23°52'16" N | 73°21'31" E |
| D | 23°51'43" N | 73°21'30" E |
| E | 23°51'22" N | 73°20'34" E |
| F | 23°51'09" N | 73°19'41" E |
| G | 23°51'09" N | 73°19'17" E |

## Kundol Nickel and Chromium Block (547.80 ha), Village: Kundol, Jhanjhari, Masota, Tehsil: Bhiloda, District: Aravalli, Gujarat




| Coordinates of Corner Points of Kundol Nickel and Chromium Block, Aravalli District, Gujarat | | | |
|---|---|---|---|
| Sl. No. | Points | Latitude | Longitude |
| 1 | A | 23°51'24" N | 73°19'16" E |
| 2 | B | 23°52'15" N | 73°19'54" E |
| 3 | C | 23°52'16" N | 73°21'31" E |
| 4 | D | 23°51'43" N | 73°21'30" E |
| 5 | E | 23°51'22" N | 73°20'34" E |
| 6 | F | 23°51'09" N | 73°19'41" E |
| 7 | G | 23°51'09" N | 73°19'17" E |

Part of Survey of India Toposheet No. 46E/05

1:12,500

0 0.175 0.35 0.7 1.05 1.4 Kilometers

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**Summary of the Mineral Block**

**PART A**

**GENERAL INFORMATION ABOUT MINERAL BLOCK**

| | Features | Details |
|---|---|---|
| 1 | **Location** | |
| | Mineral Block | **Muskaniya-Gareriatola-Barwari Potash Block** |
| i | Location | Block is bounded by,<br>Latitude: 24° 23' 31.18105" N to 24° 24' 39.37086" N<br>Longitude: 83° 31' 48.04280" E to 83° 34' 06.97176" E |
| ii | Corner Points (Latitude, Longitude) | Attached as Annexure-I |
| | Villages | Bhawanathpur, Singhitali, Makri, Barwari, Gareriatola, Bachuatola |
| | Tehsil/ Taluka | Bhawanathpur |
| | District | Garhwa |
| | State | Jharkhand |
| 2 | **Area (hectares)** | |
| | Total Area of Block for Auction | 513.69 Ha |
| | Mineralised Area | 116 Ha (1.16 Sq Km) at $\geq$6% $K_2O$. |
| | Non-mineralised area | - |
| 3 | **Exploration** | |
| | Status (G2/ G3/ G4 etc.) | G-3 (Preliminary exploration)<br>(Recommended for Composite License) |
| | Exploration Agency | Geological Survey of India, State Unit- Jharkhand, Eastern Region |
| | Highlights of Geophysical Survey | Geophysical exploration has not been conducted during present study. |
| | Highlights of Geochemical Survey | The K2O value from bed rock samples of khaki green shale/ khaki green shale intercalated with greyish black shale ranges from 3.19 to 8.27 % with an average of 5.50 % for 15 nos. of samples. The K2O value of trench samples excavated for khaki green shale intercalated with grayish black shale ranges from 2.9 to 10.21 % (average of 7.47 %). |
| | Highlights of Petrological studies | Petrographic study reveals that glauconite mineralisation is mainly associated with khaki green shale/ khaki green shale intercalated with greyish black shale and occurs as pellets, infillings, as replaced forms and as rims of the grain boundaries of the substrates. Occurrence of Glauconite bearing khaki green shale is mainly of shallow level (dominantly < 7m) which is overlain by 1.30 m to 12 m soil cover. |
| | Drilling | 20 nos of boreholes with Total meterage of 863m.<br>Core Drilling |
| | Borehole Density | 400m x 400m spacing |
| | Trench and Pit | 50 nos of Pits (50 cu.m) |
| 4 | **Quantity of Minerals (Grade wise)** | |
| | Minerals | **Potash** |

| | Features | Details |
|---|---|---|
| | **Geological Resources** (Inferred Mineral Resource-333) | |
| | The total resource of K2O for the lithovariants of dolomitic limestone and shale is calculated as 138396440 Tonnes (138.396MT) at ≥4% K2O cut off grade over an area of 2.1 sq km with average grade 6.89% | |
| 5 | **Mineralised Zones** | |
| | Number of Mineral Zones | |
| | Trend (Dip and Strike) | Lithounits exhibit horizontal to sub-horizontal disposition (10° to 15°), with a general trend of NE-SW to E-W, dipping northerly. |
| | Justification | Due the impersistent thickness of khaki green shale next level of investigations are recommended to obtain more accurate disposition for khaki green shale. It is also recommended to initiate programmes aiming to test directly the feasibility of glauconite bearing shale as alternative source of potash fertilizer. Hence further detailed exploration is recommended. |
| 6 | **Accessibility** | |
| | Nearest Rail Head | Nagar Untari lying on the Garhwa Road-Robertsganj rail section of the Eastern Railways is the nearest rail head (16 km) from the area. |
| | Road | The study area is situated about 65 km NW of district headquarter Garhwa and 100 km NW of Daltonganj. Block area is well connected by fair weather metalled road. |
| | Airport | Gaya Airport |
| 7 | **Hydrography** | |
| | Local Surface Drainage Pattern | - |
| | Rivers etc | |
| 8 | **Climate** | |
| | Mean Annual Rainfall | The average rainfall of the area is about 739mm. |
| | Temperature | Summer starts from April and lasts up to mid of June with maximum temperature going up to 45˚ C. The temperature goes up to as low as 4˚ C in winter. |
| | Temperature (June) | |
| 9 | **Topography** | |
| | Toposheet Number | 63P/11 |
| | Morphology of the area | Muskaniya Pahar (Muskaniya hill), occupying in the south eastern part of the area is a hilly forest area. |

**PART B**

**PARTICULARS OF STATUTORY LICENSE, PERMITS, PERMISSIONS, CONCESSIONS, APPROVALS AND CONSENTS RELATED TO MINING OPERATIONS**

| Sl.No. | Particulars | Details/ Status |
|---|---|---|
| 1 | Forest clearance | To be obtained by the preferred bidder |
| 2 | Wild life clearance (sanctuary, reserve or special zone clearances) | To be obtained by the preferred bidder |
| 3 | Environmental clearance | To be obtained by the preferred bidder |
| 4 | Mining plan approval | To be obtained by the preferred bidder |
| 5 | Consent to establish | To be obtained by the preferred bidder |
| 6 | Explosive license | To be obtained by the preferred bidder |
| 7 | Permission for mine opening | To be obtained by the preferred bidder |
| 8 | Permission of installation/ trial operation of equipment | To be obtained by the preferred bidder |
| 9 | Ground water clearance (Centre/State) | To be obtained by the preferred bidder |
| 10 | Railway siding approval | To be obtained by the preferred bidder |
| 11 | Approval for diesel storage | To be obtained by the preferred bidder |
| 12 | Power line from state Discom | To be obtained by the preferred bidder |
| 13 | Clearances relating to work under an existing transmission line or shifting of the transmission line | To be obtained by the preferred bidder |
| 14 | Grama Sabha consent | To be obtained by the preferred bidder |
| 15 | Any other clearances to start mining operation | To be obtained by the preferred bidder |

**PART C**

**PARTICULARS OF LAND**

| Sl. No. | Land Type | Area (in Hectares) |
|---|---|---|
| 1 | Total Concession Area | 513.69 Ha |
| 2 | Forest Land with Status | 56.2895 Ha (As per PM Gatishakti Portal) |
| 3 | Government Land with Status | - |
| 4 | Private Land with Status | - |
| 5 | Revenue survey details of the area | - |

**Note:**

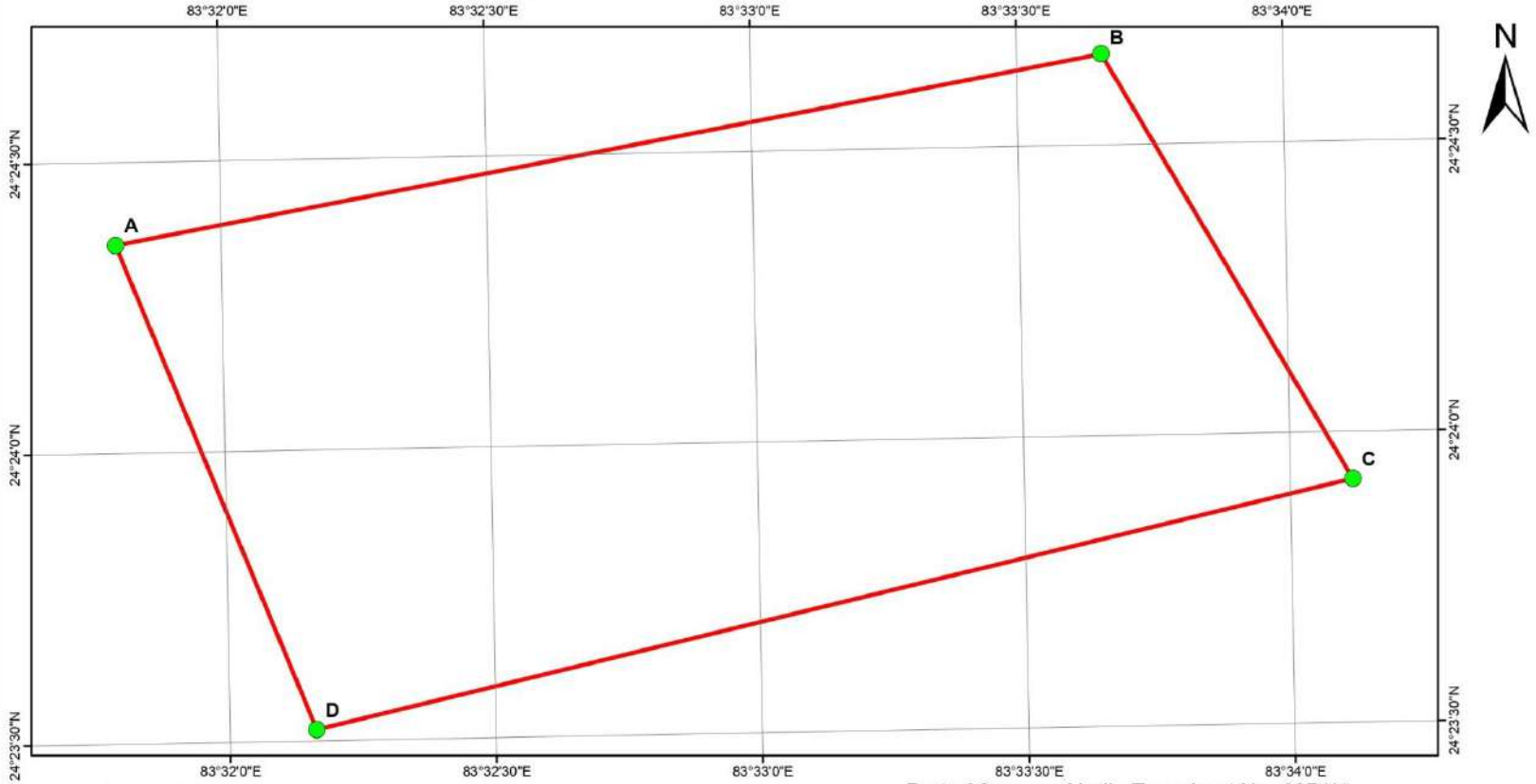
1. Mineral Block Summary has been prepared based on the available data in the Geological Report submitted by the exploration agency.
2. Co-ordinate of the block boundary has been considered after DGPS Survey of the boundary corner points of the block.
3. Block area/ Concession area given in the mineral block summary is the calculated area of co-ordinates as provided in the Annexure-I.

**Annexure-I**

**DGPS Co-ordinates of Block Boundary Corner Points of Muskaniya-Gareriatola-Barwari Potash Block**

| Point | Latitude | Longitude |
|---|---|---|
| **A** | 24° 24' 21.49172" N | 83° 31' 48.04280" E |
| **B** | 24° 24' 39.37086" N | 83° 33' 39.49118" E |
| **C** | 24° 23' 55.11577" N | 83° 34' 06.97176" E |
| **D** | 24° 23' 31.18105" N | 83° 32' 09.72999" E |

Muskaniya-Gareriatola-Barwari Potash Block (513.69 ha), Village: Bhawanathpur, Singhitali, Makri, Barwari, Gareriatola, Bachuatola, Tehsil: Bhawanathpur, District: Garhwa, Jharkhand




| Coordinates of Corner Points of Muskaniya-Gareriatola-Barwari Potash Block, Garhwa District, Jharkhand | | | |
|---|---|---|---|
| Sl. No. | Points | Latitude | Longitude |
| 1 | A | 24° 24' 21.49172" N | 83° 31' 48.04280" E |
| 2 | B | 24° 24' 39.37086" N | 83° 33' 39.49118" E |
| 3 | C | 24° 23' 55.11577" N | 83° 34' 06.97176" E |
| 4 | D | 24° 23' 31.18105" N | 83° 32' 09.72999" E |

Part of Survey of India Toposheet No. 63P/11

1:12,500

0 0.175 0.35 0.7 1.05 1.4 Kilometers

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**Summary of the Mineral Block**

**PART A**

**GENERAL INFORMATION ABOUT MINERAL BLOCK**

| | **Features** | **Details** |
|---|---|---|
| 1 | **Location** | |
| | Mineral Block | **Dudhiasol East Nickel and Copper Block** |
| i | Location | The block is bounded by the<br>Latitudes: 22°06'43.00" N to 22°07'15.00" N<br>Longitudes: 86°40'28.00"E to 86°41'05.00"E |
| ii | Corner Points (Latitude,Longitude) | Attached as Annexure-I |
| | Villages | Nua Dudhiasol, Sataputia, Bada Sarasposhi, Kesharpur |
| | Tehsil/ Taluka | Kuliana |
| | District | Mayurbhanj |
| | State | Odisha |
| 2 | **Area (hectares)** | |
| | Total Area of Block for Auction | 104.30 Ha |
| | Mineralised Area | - |
| | Non-mineralised area | - |
| 3 | **Exploration** | |
| | Status (G2/ G3/ G4 etc.) | G-2 (General Exploration) |
| | Exploration Agency | Geological Survey of India, State Unit: Odisha, Eastern Region, Bhubaneswar |
| | Drilling | 18 nos. of inclined boreholes with total drilling meterage of 3503.34 m. |
| | Borehole Density | 100m to 150m |
| | Trench and Pit | 95 nos of pits/trenches (100 cum) |
| 4 | **Quantity of Minerals (Grade wise)** | |
| | Minerals | Nickel and Copper |
| | **Geological Resources and grade** | |
| | **Indicated Mineral Resources (332) of Copper-**<br>• 4038071 tonnes (4.04 Mt) of Cu ore with 0.42% Cu at 0.2% Cu cut off, (16959.898 Tonnes Copper metal content)<br>• 2055911 tonnes (2.05 Mt) of Cu ore with 0.58% Cu at 0.4% Cu cut off, (11924.284 Tonnes Copper metal content)<br>**Indicated Mineral Resources (332) of Nickel-**<br>• 2056677 tonnes (2.05 Mt) of Ni ore with 0.19% Ni at 0.10%Ni cut-off , (3907.686 Tonnes Nickel metal content) | |
| | Average Grade | **Copper Grade-**<br>• 0.42% Cu at 0.2% Cu cut off,<br>• 0.58% Cu at 0.4% Cu cut off,<br>**Nickel Grade-**<br>• 0.19% Ni at 0.10%Ni cut-off |

| | Features | Details |
|---|---|---|
| 5 | **Mineralised Zones** | |
| | Number of Mineral Zones | Three mineralised zones |
| | Trend (Dip and Strike) | The general strike of the lithologies varies from NNE-SSW in eastern part to NNW-SSE in western part with moderate to steep dips towards NW/NE disposing a synformal structure. |
| | Average thickness(m) | The cumulative thickness of sulphide zones intersected by boreholes varies from 2.00 m to 127.55 m with an average thickness of 46.00 m. |
| 6 | **Accessibility** | |
| | Nearest Rail Head | The nearest railway station is Buramara railway station situated on Roopsa-Bangariposi broad gauge. |
| | Road | The block is 12 km from Kuliana tehsil connected through metalled road and 28 km from district headquarter Baripada connected by NH-18 up to Kuliana tehsil. |
| | Airport | Sonari Airport, Jamshedpur |
| 7 | **Hydrography** | |
| | Local Surface Drainage Pattern | The Burhabalang River is the main river system flowing in western part of the area. The flow direction is north to south. |
| | Rivers etc | |
| 8 | **Climate** | |
| | Mean Annual Rainfall | 1500 mm |
| | Temperature | The general temperature ranges from 5°-7°C in winter to 40°- 45°C in summer. |
| | Temperature (June) | |
| 9 | **Topography** | |
| | Toposheet Number | 73J/12 |
| | Morphology of the area | The block area presents a rugged and plain topography. |

## PART B

## PARTICULARS OF STATUTORY LICENSE, PERMITS, PERMISSIONS, CONCESSIONS, APPROVALS AND CONSENTS RELATED TO MINING OPERATIONS

| Sl.No. | Particulars | Details/ Status |
|---|---|---|
| 1 | Forest clearance | To be obtained by the preferred bidder |
| 2 | Wild life clearance (sanctuary, reserve or special zone clearances) | To be obtained by the preferred bidder |
| 3 | Environmental clearance | To be obtained by the preferred bidder |
| 4 | Mining plan approval | To be obtained by the preferred bidder |
| 5 | Consent to establish | To be obtained by the preferred bidder |
| 6 | Explosive license | To be obtained by the preferred bidder |
| 7 | Permission for mine opening | To be obtained by the preferred bidder |
| 8 | Permission of installation/ trial operation of equipment | To be obtained by the preferred bidder |
| 9 | Ground water clearance (Centre/State) | To be obtained by the preferred bidder |
| 10 | Railway siding approval | To be obtained by the preferred bidder |
| 11 | Approval for diesel storage | To be obtained by the preferred bidder |
| 12 | Power line from state Discom | To be obtained by the preferred bidder |
| 13 | Clearances relating to work under an existing transmission line or shifting of the transmission line | To be obtained by the preferred bidder |
| 14 | Grama Sabha consent | To be obtained by the preferred bidder |
| 15 | Any other clearances to start mining operation | To be obtained by the preferred bidder |

## PART C

## PARTICULARS OF LAND

| Sl. No. | Land Type | Area (in Hectares) |
|---|---|---|
| 1 | Total Concession Area | 104.30 Ha |
| 2 | Forest Land with Status | 22.31 Ha |
| 3 | Government Land with Status | 35.16 Ha |
| 4 | Private Land with Status | 46.83 Ha |
| 5 | Revenue survey details of the area | Block falls in Nua Dudhiasol, Sataputia, Bada Sarasposhi, Kesharpur villages. |

**Note:**

1. Mineral Block Summary has been prepared based on the available data in the Geological Report submitted by the exploration agency.
2. Co-ordinate of the block boundary has been considered after DGPS Survey of the boundary corner points of the block.
3. Block area/ Concession area given in the mineral block summary is the calculated area of co-ordinates as provided in the Annexure-I.
4. The extent of the different land types mentioned above in “PART C” has been considered from the Prime Minister Gati Shakti portal and land record portal of the State Government. The actual status of the land classification and extent of individual land will be as per the concerned government department.

**Annexure-I**

**DGPS Co-ordinates of Block Boundary Corner Points of Dudhiasol East Nickel and Copper Block**

| Points | Latitude | Longitude |
|---|---|---|
| A | 22°06'42.99999" | 86°40'28.00170" |
| B | 22°06'43.00191" | 86°41'05.00240" |
| C | 22°07'15.00028" | 86°41'05.00006" |
| D | 22°07'14.99936" | 86°40'28.00156" |

# SUMMARY OF THE MINERAL BLOCK

## PART A

## GENERAL INFORMATION ABOUT MINERAL BLOCK

<table>
<tr><th>S. No.</th><th>Features</th><th>Details</th></tr>
<tr><td rowspan="9">1</td><td>Location</td><td></td></tr>
<tr><td>Mineral Block</td><td>Babja Graphite and Manganese Block</td></tr>
<tr><td>Location</td><td>Babja block is bounded by<br>latitude 20° 49' 13.077" N to 20° 49' 33.346" N and<br>longitude 83° 19' 17.388" E to 83° 19' 48.700" E.</td></tr>
<tr><td colspan="2">DGPS Co-ordinates of Block Corner Points (Babja Graphite and Manganese Block)
<table>
<tr><th>CARDINAL POINTS</th><th>LATITUDE</th><th>LONGITUDE</th></tr>
<tr><td>A</td><td>20° 49' 33.346" N</td><td>83° 19' 20.889" E</td></tr>
<tr><td>B</td><td>20° 49' 19.176" N</td><td>83° 19' 48.700" E</td></tr>
<tr><td>C</td><td>20° 49' 13.077" N</td><td>83° 19' 45.167" E</td></tr>
<tr><td>D</td><td>20° 49' 27.305' N</td><td>83° 19' 17.388" E</td></tr>
</table></td></tr>
<tr><td>Villages</td><td>Banipali</td></tr>
<tr><td>Tehsil/Taluka</td><td>Loisingha</td></tr>
<tr><td>District</td><td>Balangir</td></tr>
<tr><td>State</td><td>Odisha</td></tr>
<tr><td rowspan="4">2</td><td>Area (Hectares)</td><td></td></tr>
<tr><td>Total Area of Block for Auction</td><td>19.50 Ha</td></tr>
<tr><td>Mineralized Area</td><td>6.15 Ha</td></tr>
<tr><td>Non-Mineralised Area</td><td>13.35 Ha</td></tr>
<tr><td rowspan="5">3</td><td>Exploration</td><td></td></tr>
<tr><td>Status (G2/G3/G4 etc.)</td><td>G2 (General Exploration)</td></tr>
<tr><td>Exploration Agency</td><td>Mineral Exploration and Consultancy Limited<br>(Formerly known as Mineral Exploration Corporation Limited) (A Govt. of India Enterprise - A Miniratna PSE), Dr. Babasaheb Ambedkar Bhavan, High Land Drive Road, Seminary Hills, Nagpur-440006.</td></tr>
<tr><td>Pitting / Trenching Details</td><td>5 pits (1m x 1m x 1m); 5.0 cu.m. for estimating bulk density</td></tr>
<tr><td>Total Number of Boreholes with meterage</td><td>Core drilling by GSI- 319.25m (05 boreholes)<br>Core drilling by MECL- 691.00m (10 boreholes)<br>Total drilling- 1010.25m (15 boreholes)</td></tr>
<tr><td></td><td>Borehole Spacing (Density)</td><td>100m x 100m</td></tr>
<tr><td rowspan="2">4</td><td colspan="2">Quantity of Minerals (Grade wise)</td></tr>
<tr><td>Mineral</td><td>Graphite and Manganese Ore</td></tr>
</table>

<table>
<tr><th>S. No.</th><th>Features</th><th>Details</th></tr>
<tr><td></td><td colspan="2">Total Geological Resources (Indicated Mineral Resource-332) of Graphite and Manganese<br><br>NET IN-SITU GEOLOGICAL RESOURCE OF GRAPHITE
<table>
<tr><th>FC Graphite Cut-off</th><th>Resources (Tonnes)</th><th>FC %</th><th>M%</th><th>VM%</th><th>Ash %</th></tr>
<tr><td>2%</td><td>110457.50</td><td>3.61</td><td>4.37</td><td>7.04</td><td>84.98</td></tr>
</table>
NET IN-SITU GEOLOGICAL RESOURCE OF MANGANESE ORE
<table>
<tr><th>Mn Cut-off</th><th>Resources (Tonnes)</th><th>Mn %</th><th>$Fe_2O_3$ %</th><th>Fe %</th><th>$SiO_2$ %</th><th>$MnO_2$ %</th><th>$P_2O_5$ %</th><th>P %</th><th>Acid Insoluble %</th><th>Mn Metal Content in Tonnes</th></tr>
<tr><td>10-18%</td><td>444928.782</td><td>12.774</td><td>18.10</td><td>13.38</td><td>34.95</td><td>8.25</td><td>0.26</td><td>0.13</td><td>47.01</td><td>56835.20</td></tr>
<tr><td>18-25%</td><td>267813.487</td><td>21.89</td><td>25.57</td><td>16.23</td><td>10.34</td><td>5.31</td><td>0.13</td><td>0.20</td><td>13.62</td><td>58624.37</td></tr>
<tr><td>+25%</td><td>87977.126</td><td>29.164</td><td>-</td><td>15.175</td><td>-</td><td>-</td><td>-</td><td>0.329</td><td>-</td><td>25657.64</td></tr>
<tr><td>Total Resources at 10% Mn cut-off</td><td>800719.39</td><td>17.62</td><td>18.61</td><td>14.53</td><td>22.88</td><td>6.36</td><td>0.19</td><td>0.17</td><td>30.68</td><td></td></tr>
</table></td></tr>
<tr><td rowspan="2"></td><td rowspan="2">Grade</td><td>Manganese: At 10%Mn cut-off the average grade is 17.62% Mn, 14.53% Fe and 0.17% P</td></tr>
<tr><td>Graphite: At 2% FC cut-off the average grade is 3.61% FC, 7.04% VM, 84.98% Ash, 4.37% Moist</td></tr>
<tr><td rowspan="4">5</td><td>Mineralised Zones</td><td></td></tr>
<tr><td>Number of Mineral Zones</td><td>Manganese: Three (03) manganese ore zones. Cummulative strike length is 1740m and thickness ranges from 1.00m to 14.16m<br>Graphite: Three (03) graphite ore zones. Cummulative strike length is 279.00m with thickness ranges from 1.00m to 6.64m</td></tr>
<tr><td>Trend (Dip and Strike)</td><td>The general trend is NW-SE direction. The general dip of the area is 75° to 80° towards north-east.</td></tr>
<tr><td>Average Thickness(m)</td><td>Manganese: Manganese Ore zones with thickness ranges from 1 to 14.16m,<br>Graphite: Graphite Ore zones with thickness ranges from 1 to 6.64m</td></tr>
<tr><td rowspan="3">6</td><td>Accessibility</td><td></td></tr>
<tr><td>Nearest Rail Head</td><td>Balangir (25 km)</td></tr>
<tr><td>Road</td><td>The area can be approached from Balangir via Chandanbhati by an all weathere pucca road. The intervening villages are connected by fair weathered jeepable metalled / unmetalled roads.</td></tr>
<tr><td></td><td>Airport</td><td>Raipur at 285 kms.</td></tr>
<tr><td rowspan="2">7</td><td>Hydrography</td><td></td></tr>
<tr><td>Local Surface Drainage Pattern (Channels)</td><td>Rain-fed easterly flowing Suktel River along with its tributaries drain the area. The drainage is sub-parallel to sub-dendritic</td></tr>
</table>

| S. No. | Features | Details |
|---|---|---|
| | | controlled by ridges and lineaments. |
| | Rivers / Streams | Suktel River |
| 8 | **Climate** | |
| | Mean Annual Rainfall | The area has a sub-tropical climate with torrential rainfall between June and September. Average annual rainfall is around 100 cm. |
| | Temperature (Winter) | Minimum temperatures 10°C (Dec - Feb) |
| | Temperature (Summer) | Maximum temperatures is up to 46°C (Mar - Jun) |
| 9 | **Topography** | |
| | Toposheet Number | Survey of India Toposheet No- 64P/05 |
| | Morphology of the Area | The area comprises of wide spread plain land, ridges, hillocks and mounds. The maximum height of the ridge is 372m and minimum elevation of the plain land is 194m above MSL. |

## PART B
## PARTICULARS OF STATUTORY LICENSES, PERMITS, TERMISSIONS, CONCESSIONS, APPROVALS AND COSENTS RELATED TO MINING OPERATIONS

| S. No. | Particulars | Details / Status |
|---|---|---|
| 1 | Forest clearance | To be obtained by the preferred bidder |
| 2 | Wild life clearance (sanctuary, reserve or special zone clearances) | To be obtained by the preferred bidder |
| 3 | Environmental clearance | To be obtained by the preferred bidder |
| 4 | Consent to Establish | To be obtained by the preferred bidder |
| 5 | Explosive license | To be obtained by the preferred bidder |
| 6 | Permission for Mine Opening | To be obtained by the preferred bidder |
| 7 | Permission of installation / trial operation of equipment | To be obtained by the preferred bidder |
| 8 | Ground water clearance (Center / State) | To be obtained by the preferred bidder |
| 9 | Railway siding approval | To be obtained by the preferred bidder |
| 10 | Approval for diesel storage | To be obtained by the preferred bidder |
| 11 | Power line from state Discom | To be obtained by the preferred bidder |
| 12 | Clearances relating to work under an existing transmission line or shifting of the transmission line | To be obtained by the preferred bidder |
| 13 | Gram Sabha consent | To be obtained by the preferred bidder |
| 14 | Consent to operate (CTO) | To be obtained by the preferred bidder |
| 15 | Approval Mine Plan from IBM | To be obtained by the preferred bidder |
| 16 | Others (if any) | To be obtained by the preferred bidder |

## PART C
## PARTICULARS OF LAND

| Sl. No. | Land Type | Area (in Hectares) |
|---|---|---|
| 1 | Total Concession Area | 19.50 Ha |
| 2 | Forest Land with Status | Nil |
| 3 | Government Land with Status | 3.43 Ha |
| 4 | Private Land with Status | 16.07 Ha |
| 5 | Revenue survey details of the area | The block falls in the village Banipali, Loisingha Taluk, Balangir District, Odisha. |

**Note:**

1. Mineral Block Summary has been prepared based on the available data in the Geological Report submitted by the exploration agency.
2. Co-ordinate of the block boundary has been considered after DGPS Survey of the boundary corner points of the block.
3. Block area/ Concession area given in the mineral block summary is the calculated area of co-ordinates as provided in the mineral block summary.
4. The extent of the different land types mentioned above in "PART C" has been considered from the Prime Minister Gati Shakti portal and land record portal of the State Government. The actual status of the land classification and extent of individual land will be as per the concerned government department.

# SUMMARY OF THE MINERAL BLOCK

## PART A

## GENERAL INFORMATION ABOUT MINERAL BLOCK

<table>
<tr><td></td><td>Features</td><td>Details</td></tr>
<tr><td>1</td><td>Location</td><td></td></tr>
<tr><td></td><td>Mineral Block</td><td>Biarpalli Graphite and Manganese Block</td></tr>
<tr><td>i</td><td>Location</td><td>Block area is bounded by,<br>Latitude : 20° 47' 38.3449" N to 20° 48' 31.3466" N<br>Longitude : 89° 19' 47.4516" E to 89° 20' 49.6797" E.</td></tr>
<tr><td>ii</td><td>Corner Points (Latitude, Longitude)</td><td>DGPS Co-ordinates of the cardinal points of Block Boundary of the Biarpalli Graphite and Manganese Block<br><table><tr><th>POINTS</th><th>LATITUDE</th><th>LONGITUDE</th></tr><tr><td>A</td><td>20° 47' 58.8991" N</td><td>89° 19' 47.4516" E</td></tr><tr><td>B</td><td>20° 48' 31.3466" N</td><td>89° 20' 32.9743" E</td></tr><tr><td>C</td><td>20° 48' 10.6410" N</td><td>89° 20' 49.6797" E</td></tr><tr><td>D</td><td>20° 47' 38.3449" N</td><td>89° 20' 04.3765" E</td></tr></table></td></tr>
<tr><td></td><td>Villages</td><td>Badipali, Biarpali, Belpali</td></tr>
<tr><td></td><td>Tehsil/ Taluka</td><td>Loisingha</td></tr>
<tr><td></td><td>District</td><td>Balangir</td></tr>
<tr><td></td><td>State</td><td>Odisha</td></tr>
<tr><td>2</td><td>Area (hectares)</td><td></td></tr>
<tr><td></td><td>Total Area of Block for Auction</td><td>131.82 Ha.</td></tr>
<tr><td></td><td>Mineralised Area</td><td>19.25 Ha.</td></tr>
<tr><td></td><td>Non-mineralised area</td><td>112.57 Ha.</td></tr>
<tr><td>3</td><td>Exploration</td><td></td></tr>
<tr><td></td><td>Status (G2/ G3/ G4 etc.)</td><td>G2 (General Exploration)</td></tr>
<tr><td></td><td>Exploration Agency</td><td>Mineral Exploration and Consultancy Limited<br>(Formerly known as Mineral Exploration Corporation Limited), (A Govt. of India Enterprise - A Miniratna PSE), Dr. BabasahebAmbedkarBhavan, High Land Drive Road, Seminary Hills, Nagpur-440 006.</td></tr>
<tr><td></td><td>Trench and Pit</td><td>5 pits (1m x 1m x 1m); 5cu.m. for estimating bulk density</td></tr>
<tr><td></td><td>Drilling</td><td>Core drilling by GSI- 1055.05m (11 boreholes)<br>Core drilling by MECL- 2360.50m (27 boreholes)<br>Total drilling- 3415.55m (38 boreholes)</td></tr>
<tr><td></td><td>Borehole Density</td><td>100m x 100m</td></tr>
<tr><td>4</td><td colspan="2">Quantity of Minerals (Grade wise)</td></tr>
<tr><td></td><td>Minerals</td><td>Graphite and Manganese</td></tr>
<tr><td></td><td colspan="2">Net Geological Resources of Manganese Ore and Graphite</td></tr>
</table>

| | Features | Details |
|---|---|---|
| | **Net in-situ geological resources of Graphite:** | |

| FC%-Graphite Cut off | Resources (Tonnes) | FC % | Moisture % | Ash % | VM % |
|---|---|---|---|---|---|
| **Total resources at 2% FC** | **301112.0** | **3.71** | **1.71** | **8.03** | **86.55** |

**Category wise Net Geological Resources of Manganese Ore**

| CUT-OFF (Mn) | Indicated Resource (Tonnes) | Inferred Resource (Tonnes) | Total Resource (Tonnes) | Average Quality | | | Mn Metal Content (Tonnes) |
|---|---|---|---|---|---|---|---|
| | | | | Mn% | Fe% | P% | |
| 10-18% | 1234618.50 | 189293.09 | 1423911.59 | 13.45 | 13.39 | 0.25 | 191516.109 |
| 18-25% | 1269503.55 | 213829.98 | 1483333.53 | 21.14 | 16.16 | 0.36 | 313576.708 |
| >25% | 420562.00 | 30655.37 | 451217.37 | 26.75 | 17.32 | 0.38 | 120700.646 |
| **Total Resources (at 10% Mn Cut-off)** | **2924684.05** | **433778.44** | **3358462.49** | **18.63** | **15.14** | **0.31** | |
| | **2.925 mt** | **0.434 mt** | **3.358 mt** | | | | |

| | | |
|---|---|---|
| 5 | **Mineralised Zones** | |
| | Number of Mineral Zones | **Graphite:** Four (04) graphite ore zones. Cumulative strike length is 1036.50m and thickness ranges from 1.00 to 12.00m<br>**Manganese**: Five (05) manganese ore zones. Cumulative strike length is 3263m and thickness ranges from 1.00 to 41.34m |
| | Trend (Dip and Strike) | The general trend is NNW-SSE to NE-SW direction. The general dip of the area is 60° to 80° towards south-east. |
| | Average Thickness(m) | **Manganese:** 5 Manganese Ore zones with thickness ranges from 1 to 41m,<br>**Graphite**:4 Graphite Ore zones with thickness ranges from 1 to 12m |
| 6 | **Accessibility** | |
| | Nearest Rail Head | Balangir (25 km) |
| | Road | The area is connected by fair weather road from the State Highway No.1 (Balangir-Patanagarh Road). |
| | Airport | Raipur |
| 7 | **Hydrography** | |
| | Local Surface Drainage Pattern(Channels) Rivers etc | Rain-fed easterly flowing Suktel River along with its tributaries drain the area. The drainage is sub-parallel to sub-dendritic controlled by ridges and lineaments. |
| 8 | **Climate** | |
| | Mean Annual Rainfall | 100 cm |
| | Temperature | The temperature ranges between 10° C in winter and 46° C in summer season |
| | Temperature (June) | |
| 9 | **Topography** | |
| | Toposheet Number | Survey of India Toposheet Number- 64P/05 |
| | Morphology of the area | The area comprises of wide spread plain land, ridges, hillocks and mounds. The maximum height of the ridge is 372m and minimum elevation of the plain land is 194m above MSL. |

## PART B

## PARTICULARS OF STATUTORY LICENSE, PERMITS, PERMISSIONS, CONCESSIONS, APPROVALS AND CONSENTS RELATED TO MINING OPERATIONS

| Sl.No. | Particulars | Details/ Status |
|---|---|---|
| 1 | Forest clearance | To be obtained by the preferred bidder |
| 2 | Wild life clearance (sanctuary, reserve or special zone clearances) | To be obtained by the preferred bidder |
| 3 | Environmental clearance | To be obtained by the preferred bidder |
| 4 | Mining plan approval | To be obtained by the preferred bidder |
| 5 | Consent to establish | To be obtained by the preferred bidder |
| 6 | Explosive license | To be obtained by the preferred bidder |
| 7 | Permission for mine opening | To be obtained by the preferred bidder |
| 8 | Permission of installation/ trial operation of equipment | To be obtained by the preferred bidder |
| 9 | Ground water clearance (Centre/State) | To be obtained by the preferred bidder |
| 10 | Railway siding approval | To be obtained by the preferred bidder |
| 11 | Approval for diesel storage | To be obtained by the preferred bidder |
| 12 | Power line from state Discom | To be obtained by the preferred bidder |
| 13 | Clearances relating to work under an existing transmission line or shifting of the transmission line | To be obtained by the preferred bidder |
| 14 | GramaSabha consent | To be obtained by the preferred bidder |
| 15 | Any other clearances to start mining operation | To be obtained by the preferred bidder |

## PART C
## PARTICULARS OF LAND

| Sl. No. | Land Type | Area (in Hectares) |
|---|---|---|
| 1 | Total Concession Area | 131.82 Ha |
| 2 | Forest Land with Status | Nil |
| 3 | Government Land with Status | 36.38 Ha |
| 4 | Private Land with Status | 95.44 Ha |
| 5 | Revenue survey details of the area | Block falls in the villages of Badipali, Biarpali and Belpali of Loisingha tehsil, Balangir District, Odisha |

**Note:**

1. Mineral Block Summary has been prepared based on the available data in the Geological Report submitted by the exploration agency.
2. Co-ordinate of the block boundary has been considered after DGPS Survey of the boundary corner points of the block.
3. Block area/ Concession area given in the mineral block summary is the calculated area of co-ordinates as provided in the mineral block summary.
4. The extent of the different land types mentioned above in "PART C" has been considered from the Prime Minister Gati Shakti portal and land record portal of the State Government. The actual status of the land classification and extent of individual land will be as per the concerned government department.

**Summary of the Mineral Block**

**PART A**

**GENERAL INFORMATION ABOUT MINERAL BLOCK**

| | Features | Details |
|---|---|---|
| 1 | **Location** | |
| | Mineral Block | **Akharkata Graphite Block** |
| i | Location | Block is bounded by,<br>Latitude: 20° 50' 26.160" N to 20° 51' 46.800" N<br>Longitude: 84° 34' 4.080" E to 84° 36' 25.560" E |
| ii | Corner Points (Latitude,Longitude) | Attached as Annexure-I |
| | Villages | Akharkata, Talamaliha, Ambasaramunda |
| | Tehsil/ Taluka | Athamallik |
| | District | Angul |
| | State | Odisha |
| 2 | **Area (hectares)** | |
| | Total Area of Block for Auction | 752.77 Ha |
| | Mineralised Area | - |
| | Non-mineralised area | - |
| 3 | **Exploration** | |
| | Status (G2/ G3/ G4 etc.) | G-4 ( Reconnaissance Survey)<br>(Recommended for Composite License) |
| | Exploration Agency | Geological Survey of India, State Unit- Odisha, Eastern Region, Bhubaneswar |
| | Highlights of Gephysical Survey | B Jena and N Kar (1966), carried out geophysical investigations for graphite in the Athmallik Sub-Division, Dhenkanal district, Orissa. The investigation work has identified 18 SP anomalies including 7 major and 11 minor anomalies. They had designated these as 1 (A, B), 2 (A, B, C), 3 (A, B), 4 (A, B), 5, 6 (A, B), 7, 8, 9 (A, B) and 10 (A, B) and had indicated that the two to the north of Akharkata hill (2B & 2C), three in Ambasarmunda (3A, 3B & 4A) and two in Girida area (9A & 9B) appear to be significant and promising, in view of their large magnitude, areal extent and presence of causative body at shallow depth. |
| | Highlights of Geochemical Survey | The analytical results of 25 nos BRS samples shows value ranging from <1% F.C to 27.53% F.C., out of which 14 samples shows fixed carbon more than 2%. Analytical results of trench samples along the profile of borehole ODADW-01 (PT-01) shows a zone of 3.0 m x 6.93% Fixed carbon (F.C.), along borehole profile ODADW-02 (PT 4) shows a zone of 4.0 m x 5.1025% F.C., along profile of borehole ODADW-03 (PT-6) shows a zone of 23 m x 3.22% F.C, along the profile of borehole ODADW-05 |

| | Features | Details |
|---|---|---|
| | | (PT-03) shows 2.0 m x 5.41% FC and 2.0 m x 4.84% F.C and along profile of borehole ODADW-06 (PT-5) a zone of 1.0 m x 2.44% FC and 2.0 x 3.47% F.C have observed. |
| | Highlights of Petrographic Studies | Under microscope graphite is brownish grey in colour in plane polarized light with very strong pleochroism ranging from brown-grey with a yellow tint to dark grey. Under crossed polarized light graphite, grains were observed as dark brown to brownish-grey in colour with low reflectance with barely more reflective than quartz in the darkest position. The graphite grains were observed to have perfectly developed cleavage. |
| | Drilling | 06 nos of Scout boreholes with total drilling meterage of 482.65m. |
| | Borehole Density | Scout Core drilling |
| | Trench and Pit | 07 nos of trenching (101 cum) |
| 4 | **Resources and Grade of Mineral** | |
| | Minerals | Graphite |
| | Resources not estimated. | |
| 5 | **Mineralised Zones** | |
| | Number of Mineral Zones | - |
| | Trend (Dip and Strike) | At most of the places the foliation is E -W with 55° to 75° dip towards north. |
| | Mineralization | |
| | Justification | As per the data available in the report indicates the presence of graphite mineralization in the block area. The block may be recommended for putting for auction of composite license (CL) for up-gradation of level of exploration to assess the full economic potentiality of the graphite mineralization in the block. |
| 6 | **Accessibility** | |
| | Nearest Rail Head | Boinda |
| | Road | The area is 20 km north-east of Tehsil headquarter Athamallik. The National Highway No. 55 passes approximately 25 km north east of the block and connects Cuttack and Sambalpur via Angul. |
| | Airport | Bhubaneswar Airport |
| 7 | **Hydrography** | |
| | Local Surface Drainage Pattern | The drainage pattern is dendritic to subdendritic and drainage density is low. The Bhogra nala is the major nala of the area. |
| | Rivers etc | |
| 8 | **Climate** | |
| | Mean Annual Rainfall | The annual rainfall in the area is 1421 mm. |
| | Temperature | December is the coldest month with mean daily minimum temperature of 11°C. Both day and night temperature increases rapidly from March |
| | Temperature (June) | |

| | Features | Details |
|---|---|---|
| | | and by May the mean daily maximum temperature reaches to 42°C, while the mean minimum temperature is 26.8°C. |
| 9 | **Topography** | |
| | Toposheet Number | 73 D/ 9 |
| | Morphology of the area | The area under investigation, represent a vast pediplain area in the central and north eastern part with few scattered mounds. The other parts arts are representedby high structural ridges and mounds with undulating topography. |

**PART B**

**PARTICULARS OF STATUTORY LICENSE, PERMITS, PERMISSIONS, CONCESSIONS, APPROVALS AND CONSENTS RELATED TO MINING OPERATIONS**

| Sl.No. | Particulars | Details/ Status |
|---|---|---|
| 1 | Forest clearance | To be obtained by the preferred bidder |
| 2 | Wild life clearance (sanctuary, reserve or special zone clearances) | To be obtained by the preferred bidder |
| 3 | Environmental clearance | To be obtained by the preferred bidder |
| 4 | Mining plan approval | To be obtained by the preferred bidder |
| 5 | Consent to establish | To be obtained by the preferred bidder |
| 6 | Explosive license | To be obtained by the preferred bidder |
| 7 | Permission for mine opening | To be obtained by the preferred bidder |
| 8 | Permission of installation/ trial operation of equipment | To be obtained by the preferred bidder |
| 9 | Ground water clearance (Centre/State) | To be obtained by the preferred bidder |
| 10 | Railway siding approval | To be obtained by the preferred bidder |
| 11 | Approval for diesel storage | To be obtained by the preferred bidder |
| 12 | Power line from state Discom | To be obtained by the preferred bidder |
| 13 | Clearances relating to work under an existing transmission line or shifting of the transmission line | To be obtained by the preferred bidder |
| 14 | Grama Sabha consent | To be obtained by the preferred bidder |
| 15 | Any other clearances to start mining operation | To be obtained by the preferred bidder |

**PART C**

**PARTICULARS OF LAND**

| Sl. No. | Land Type | Area (in Hectares) |
|---|---|---|
| 1 | Total Concession Area | 752.77 Ha |
| 2 | Forest Land with Status | - |
| 3 | Government Land with Status | - |
| 4 | Private Land with Status | - |
| 5 | Revenue survey details of the area | - |

**Note:**

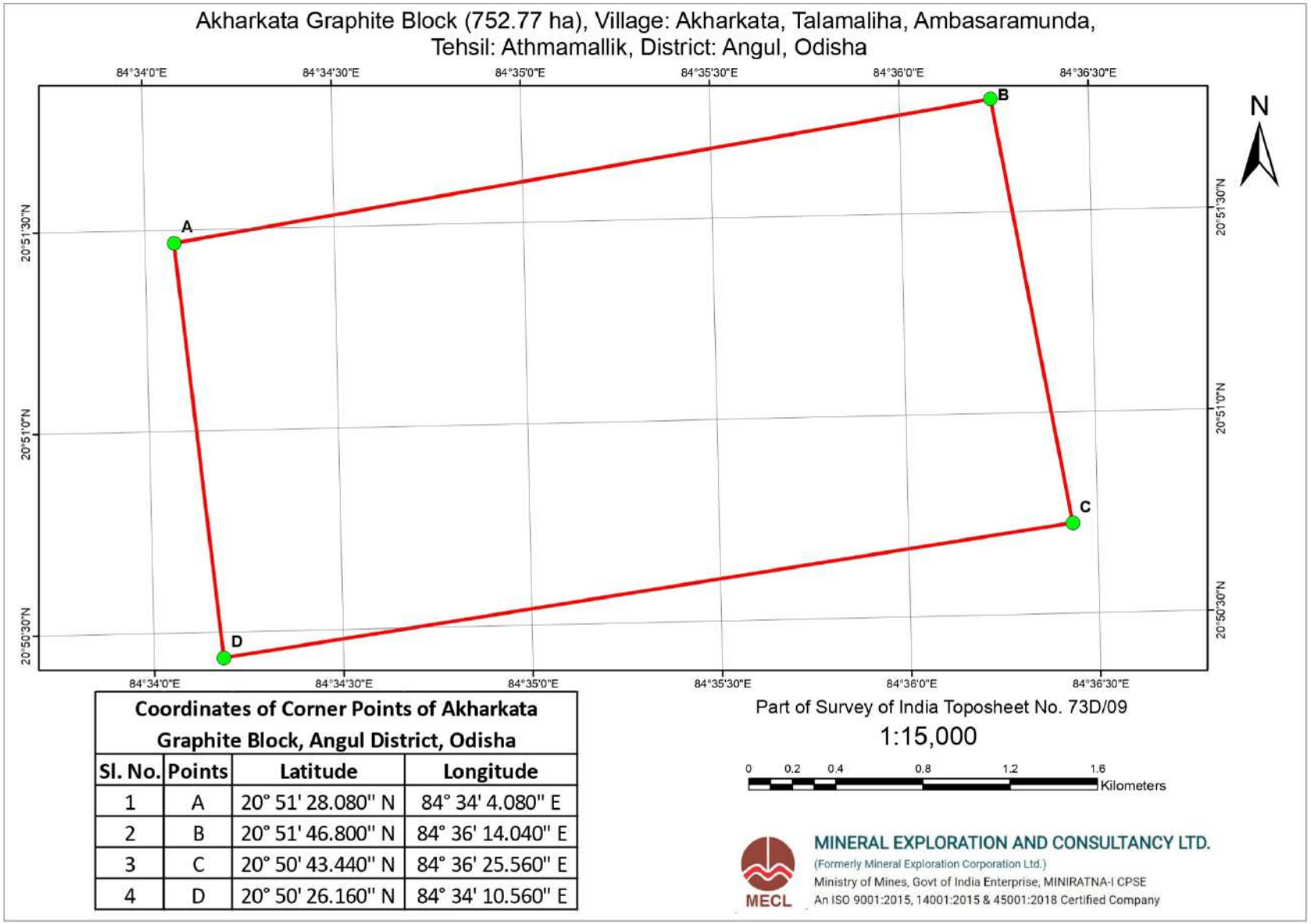
1. Mineral Block Summary has been prepared based on the available data in the Geological Memorandum (ER_OD_ 03_Block-1_Akharkata) and Geological Report submitted by the exploration agency.
2. Co-ordinate of the block boundary has been considered from the Geological Memorandum.
3. Block area/ Concession area given in the mineral block summary is the calculated area of co-ordinates as provided in the Annexure-I.

***

**Annexure-I**

**Co-ordinates of Block Boundary Corner Points of Akharkata Graphite Block**

| CARDINAL POINTS | Latitude | Longitude |
|---|---|---|
| A | 20° 51' 28.080" N | 84° 34' 4.080" E |
| B | 20° 51' 46.800" N | 84° 36' 14.040" E |
| C | 20° 50' 43.440" N | 84° 36' 25.560" E |
| D | 20° 50' 26.160" N | 84° 34' 10.560" E |




| Coordinates of Corner Points of Akharkata Graphite Block, Angul District, Odisha | | | |
|---|---|---|---|
| Sl. No. | Points | Latitude | Longitude |
| 1 | A | 20° 51' 28.080" N | 84° 34' 4.080" E |
| 2 | B | 20° 51' 46.800" N | 84° 36' 14.040" E |
| 3 | C | 20° 50' 43.440" N | 84° 36' 25.560" E |
| 4 | D | 20° 50' 26.160" N | 84° 34' 10.560" E |

**Summary of the Mineral Block**

**PART A**

**GENERAL INFORMATION ABOUT MINERAL BLOCK**

| | Features | Details |
|---|---|---|
| 1 | **Location** | |
| | Mineral Block | **Vellakkal Central (Segment-A) Molybdenum Block** |
| i | Location | Block is bounded by,<br>Latitude: N 12° 12' 7.62" to N 12° 12' 48.84"<br>Longitude: E 78°26'11.02" to E 78°26'46.15" |
| ii | Corner Points (Latitude,Longitude) | Attached as Annexure-1 |
| | Villages | Vellimalai |
| | Tehsil/ Taluka | Uttangarai |
| | District | Krishnagiri |
| | State | Tamil Nadu |
| 2 | **Area (hectares)** | |
| | Total Area of Block for Auction | 65.17 Ha |
| | Mineralised Area | - |
| | Non-mineralised area | - |
| 3 | **Exploration** | |
| | Status (G2/ G3/ G4 etc.) | G-3 (Preliminary exploration)<br>(Recommended for Composite License) |
| | Exploration Agency | Geological Survey of India, State Unit- Tamil Nadu & Puducherry |
| | Highlights of Geophysical Survey | Ground Geophysical survey employing Magnetic, IP, SP and resistivity survey was carried in Vellakkal central block (segment-A) during FS 2019-20 over 0.559 sqkm area (10 LKM with 50m line interval) targeting the sheared quartz vein. Moderate chargeability anomaly has shown in southern part of the map for strike length of 700 strike length. Moderate resistivity anomaly is observed mainly on the high chargeability zone in the southern part from baseline while high resistivity is observed in the northern part of the baseline. The integrated geological maps and geophysical map revealed one geophysical anomaly zone (high magnetic and moderate chargeability) lying in NNW-SSE direction in southern part of the area and parallel to the sheared quartz vein, which might have correlated with presence of sulphide in the area. The intersection of mineralized lodes is also supporting the anomalous area. In addition 1671.30m geophysical loggings of 12 boreholes have been carried out. |
| | Highlights of Geochemical Survey | Geochemical exploration was carried out by the bedrock and Pitting/ trench sampling methods. In investigation block, 25 bedrock samples were collected from quartz vein and 100 PTS were collected as weathered gneiss and soil from shear zone. 25 BRS have been collected from three profiles, where there is surface indication mineralization is noticed and all BRS were collected from sheared quartz vein only. Integrated study of geological and geochemical exploration (present and |

| | Features | Details |
|---|---|---|
| | | previous data) depicts that, from south to central part of the shear zone is more promising for molybdenum and associated sulphide mineralisation. |
| | Drilling | 12 nos of boreholes with total drilling meterage of 1734.00 m |
| | Borehole Density | 100m to 200m spacing<br>1st level- 7 boreholes at 50m x 100m with 50m vertical intersection.<br>2nd level- 5 boreholes at 100m x 200m with 100m vertical intersection. |
| | Trench and Pit | 11 trenches (300 cubic meters) |
| 4 | **Resources and Grade of Minerals** | |
| | Minerals | Molybdenum Ore |
| | Total Inferred Resource (333) of Molybdenum Ore | |
| | Over 1025m strike length following resources estimated-<br>• 1.439 million tonnes with average grade of 243.63 ppm molybdenum (0.01 % cut off), (350.584 Tonnes Mo metal content)<br>• 0.354 million tonnes with average grade of 389.57 ppm molybdenum (0.03% cut-off), (137.908 Tonnes Mo metal content)<br>• 0.117 million tonnes with average grade of 537.92 ppm molybdenum (0.05% cut-off), (62.937 Tonnes Mo metal content) | |
| 5 | **Mineralised Zones** | |
| | Number of Mineral Zones | - |
| | Trend (Dip and Strike) | The mineralised shear zone trends in NNE-SSW direction with 50° to 65° SE dips. |
| | Justification | Based on the outcome of the present investigation, the molybdenum mineralization was intersected in almost all I and II level borehole with nos. of lodes ranging from 1 to 3 except one second level boreholes. Therefore, 100m spacing of II level boreholes and 200m spacing of III level boreholes are recommended to delineate the deeper mineralization with higher level of confidence for additional resource in the block. Hence, block is recommended for auction under Composite License. |
| 6 | **Accessibility** | |
| | Nearest Rail Head | Morappur |
| | Road | It is located 48 km towards South from District head quarters Krishnagiri, 12 Km from Uthangarai and 254 Km from State capital Chennai. |
| | Airport | Salem Airport |
| 7 | **Hydrography** | |
| | Local Surface Drainage Pattern | - |
| | Rivers etc | |
| 8 | **Climate** | |
| | Mean Annual Rainfall | 794 millimeters |
| | Temperature | The hottest period of the year is between the months of March to May, reaching up to maximum temperature of up to 46°C in April. The |
| | Temperature (June) | |

| | Features | Details |
|---|---|---|
| | | temperatures drop in December and the low temperatures continue up to February, touching a minimum of 12°C in January. |
| 9 | **Topography** | |
| | Toposheet Number | 57 L/08 |
| | Morphology of the area | The study area shows gently undulating topography. The undulating terrain is partly covered by shrubby and tropical vegetation and reserve forest areas. The soil is mostly in-situ in nature, earthy and pale reddish in colour. |

**PART B**

**PARTICULARS OF STATUTORY LICENSE, PERMITS, PERMISSIONS, CONCESSIONS, APPROVALS AND CONSENTS RELATED TO MINING OPERATIONS**

| Sl.No. | Particulars | Details/ Status |
|---|---|---|
| 1 | Forest clearance | To be obtained by the preferred bidder |
| 2 | Wild life clearance (sanctuary, reserve or special zone clearances) | To be obtained by the preferred bidder |
| 3 | Environmental clearance | To be obtained by the preferred bidder |
| 4 | Mining plan approval | To be obtained by the preferred bidder |
| 5 | Consent to establish | To be obtained by the preferred bidder |
| 6 | Explosive license | To be obtained by the preferred bidder |
| 7 | Permission for mine opening | To be obtained by the preferred bidder |
| 8 | Permission of installation/ trial operation of equipment | To be obtained by the preferred bidder |
| 9 | Ground water clearance (Centre/State) | To be obtained by the preferred bidder |
| 10 | Railway siding approval | To be obtained by the preferred bidder |
| 11 | Approval for diesel storage | To be obtained by the preferred bidder |
| 12 | Power line from state Discom | To be obtained by the preferred bidder |
| 13 | Clearances relating to work under an existing transmission line or shifting of the transmission line | To be obtained by the preferred bidder |
| 14 | Grama Sabha consent | To be obtained by the preferred bidder |
| 15 | Any other clearances to start mining operation | To be obtained by the preferred bidder |

**PART C**

**PARTICULARS OF LAND**

| Sl. No. | Land Type | Area (in Hectares) |
|---|---|---|
| 1 | Total Concession Area | 65.17 Ha |
| 2 | Forest Land with Status | 14.9485 Ha (As per PM Gatishakti Portal) |
| 3 | Government Land with Status | - |
| 4 | Private Land with Status | - |
| 5 | Revenue survey details of the area | - |

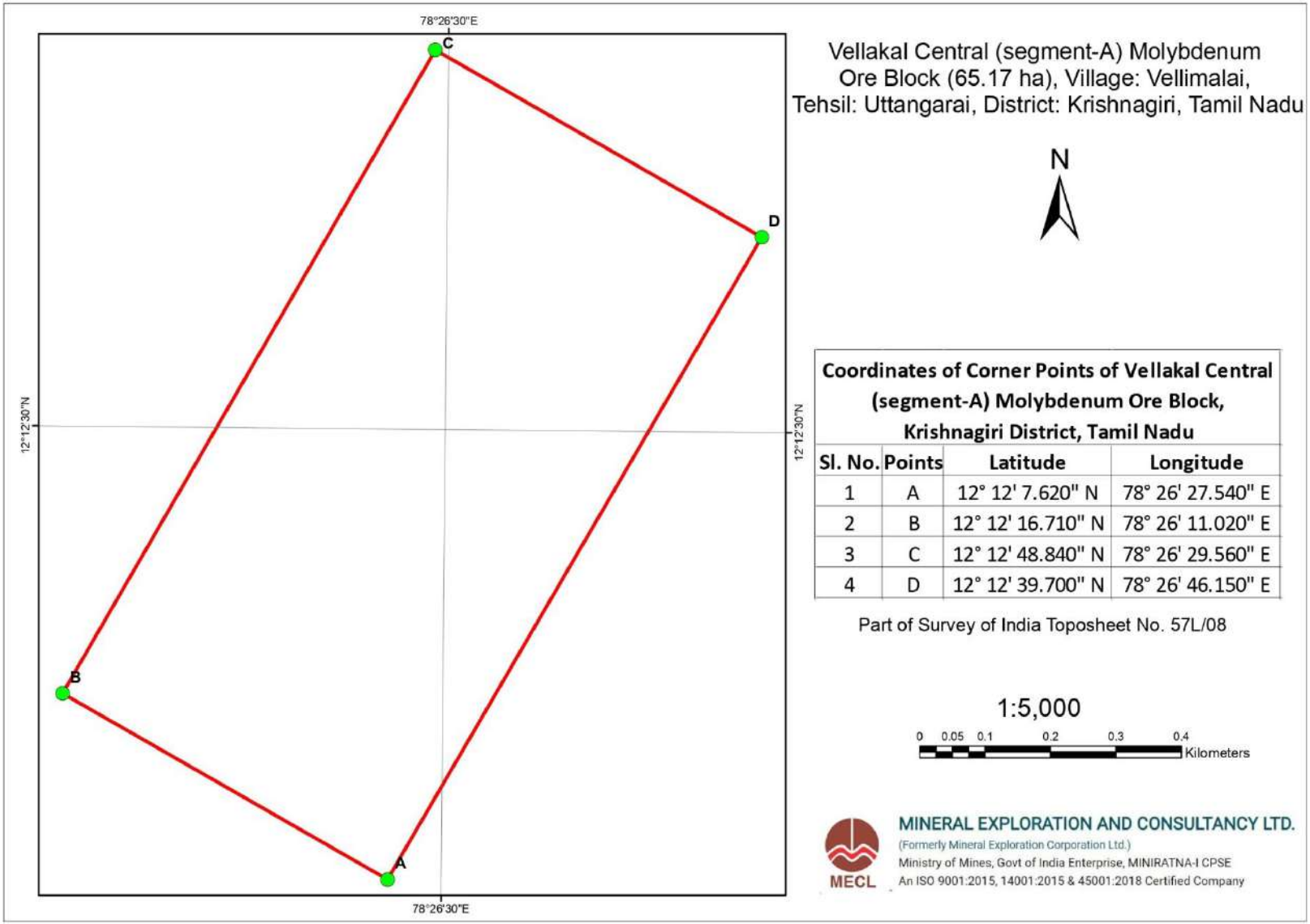
**Note:**

1. Mineral Block Summary has been prepared based on the available data in the Geological Report submitted by the exploration agency.
2. Co-ordinate of the block boundary has been considered from the Geological Report.
3. Block area/ Concession area given in the mineral block summary is the calculated area of co-ordinates as provided in the Annexure-I.

Annexure-I

**GPS Co-ordinates of Block Boundary Corner Points of Vellakkal Central (Segment-A) Molybdenum Block**

| Point | Latitude | Longitude |
|---|---|---|
| **A** | 12˚12’7.62” | 78˚26’27.54’’ |
| **B** | 12˚12’16.71’’ | 78˚26’11.02’’ |
| **C** | 12˚12’48.84’’ | 78˚26’29.56’’ |
| **D** | 12˚12’39.7’’ | 78˚26’46.15’’ |




Vellakal Central (segment-A) Molybdenum Ore Block (65.17 ha), Village: Vellimalai, Tehsil: Uttangarai, District: Krishnagiri, Tamil Nadu

N

**Coordinates of Corner Points of Vellakal Central (segment-A) Molybdenum Ore Block, Krishnagiri District, Tamil Nadu**

| Sl. No. | Points | Latitude | Longitude |
|---|---|---|---|
| 1 | A | 12° 12' 7.620" N | 78° 26' 27.540" E |
| 2 | B | 12° 12' 16.710" N | 78° 26' 11.020" E |
| 3 | C | 12° 12' 48.840" N | 78° 26' 29.560" E |
| 4 | D | 12° 12' 39.700" N | 78° 26' 46.150" E |

Part of Survey of India Toposheet No. 57L/08

1:5,000

0 0.05 0.1 0.2 0.3 0.4 Kilometers

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(Formerly Mineral Exploration Corporation Ltd.)
Ministry of Mines, Govt of India Enterprise, MINIRATNA-I CPSE
An ISO 9001:2015, 14001:2015 & 45001:2018 Certified Company

**Summary of the Mineral Block**

**PART A**

**GENERAL INFORMATION ABOUT MINERAL BLOCK**

| | Features | Details |
|---|---|---|
| 1 | **Location** | |
| | Mineral Block | **Nochchipatti Molybdenum Block** |
| i | Location | Block is bounded by,<br>Latitude: 12°13ˈ33.4ˈˈN to 12°15ˈ01.60ˈˈN<br>Longitude: 78°29ˈ04.85ˈˈE to 78°30ˈ23.47ˈˈE |
| ii | Corner Points (Latitude,Longitude) | Attached as Annexure-I |
| | Villages | Nochichipatti and Kanakampatti |
| | Tehsil/ Taluka | Uttangarai |
| | District | Krishnagiri |
| | State | Tamil Nadu |
| 2 | **Area (hectares)** | |
| | Total Area of Block for Auction | 299.82 Ha |
| | Mineralised Area | - |
| | Non-mineralised area | - |
| 3 | **Exploration** | |
| | Status (G2/ G3/ G4 etc.) | G-3 (Preliminary exploration)<br>(Recommended for Composite License) |
| | Exploration Agency | Geological Survey of India, State Unit- Tamil Nadu& Puducherry |
| | Highlights of Geophysical Survey | The cluster of magnetic anomaly indicates the existence shearing. From the stack profiles, it may be inferred that the intensity of shearing is more in south-eastern part as compared to north-western part and it could predict that the intensity of shearing is diminishing towards northwest. This zone is important for molybdenite mineralization. Geologically the molybdenum mineralization is restricted to shear zone in investigation block. |
| | Highlights of Geochemical Survey | The Mo in BRS samples varies from 1.5 to 108 ppm. In PTS samples, Mo varies from 0.3 to 29.94 ppm. |
| | Drilling | 14 number of borehole with total drilling meterage of 1560.50m.<br>Core Drilling |
| | Borehole Density | 100m to 200m spacing |
| | Trench and Pit | 24 trenches (400 cum) |
| 4 | **Resources and Grade of Mineral** | |
| | Minerals | Molybdenum Ore |
| | Total Inferred Resource of Molybdenum Ore | |
| | • 0.29 million tonnes with average grade of 385 ppm molybdenum at 0.01 % cut off over 450m strike length, (111.650 Tonnes Mo metal Content)<br>• 0.09 million tonnes with average grade of 580 ppm molybdenum at 0.03% cut-off off over 300m strike length, (52.200 Tonnes Mo metal Content)<br>• 0.02 million tonnes with average grade of 1109 ppm molybdenum at 0.05% cut-off off | |

| | Features | Details |
|---|---|---|
| | over 150m strike length, (22.180 Tonnes Mo metal Content) | |
| 5 | **Mineralised Zones** | |
| | Number of Mineral Zones | 03 nos of lodes |
| | Trend (Dip and Strike) | The general strike of lithology (charnockite, pyroxene granulite and quartzofeldspathic gneiss) is NE – SW and dips towards north-west and the shear foliation strikes vary from N35°E to N45°E and dips toward south-east varying 50° to 75°. |
| | Justification | Based on the G3 level of exploration, inferred mineral resources of Molybdenum Ore has been established. To infer the details of the mining feasibility, detailed exploration is required. Hence block area is recommended for grant of Composite Licence. |
| 6 | **Accessibility** | |
| | Nearest Rail Head | Dasampatti (6.5km) and Sambalpatti (15km) being the nearest rail heads. |
| | Road | Nochchipatti block is situated in and around Nochchipatti village, which is 6.5 km from Uthangarai, on the Uthangarai-Kallavi road. |
| | Airport | Salem Airport |
| 7 | **Hydrography** | |
| | Local Surface Drainage Pattern | The perennial Ponniyar River on the south of the area flows eastwards. It is contributed by several NNE flowing tributaries. |
| | Rivers etc | |
| 8 | **Climate** | |
| | Mean Annual Rainfall | The average rainfall for the region varies 600 mm to 700 mm. |
| | Temperature | Summer is very hot with temperature ranging from 35°C to 44°C. |
| | Temperature (June) | |
| 9 | **Topography** | |
| | Toposheet Number | Survey of India Toposheet No- 57 L/08 |
| | Morphology of the area | The area is a gently undulating terrain with a NNE-SSW ridge having a maximum elevation of 379m above mean sea level. |

**PART B**

**PARTICULARS OF STATUTORY LICENSE, PERMITS, PERMISSIONS, CONCESSIONS, APPROVALS AND CONSENTS RELATED TO MINING OPERATIONS**

| Sl.No. | Particulars | Details/ Status |
|---|---|---|
| 1 | Forest clearance | To be obtained by the preferred bidder |
| 2 | Wild life clearance (sanctuary, reserve or special zone clearances) | To be obtained by the preferred bidder |
| 3 | Environmental clearance | To be obtained by the preferred bidder |
| 4 | Mining plan approval | To be obtained by the preferred bidder |
| 5 | Consent to establish | To be obtained by the preferred bidder |
| 6 | Explosive license | To be obtained by the preferred bidder |
| 7 | Permission for mine opening | To be obtained by the preferred bidder |
| 8 | Permission of installation/ trial operation of equipment | To be obtained by the preferred bidder |
| 9 | Ground water clearance (Centre/State) | To be obtained by the preferred bidder |
| 10 | Railway siding approval | To be obtained by the preferred bidder |
| 11 | Approval for diesel storage | To be obtained by the preferred bidder |
| 12 | Power line from state Discom | To be obtained by the preferred bidder |
| 13 | Clearances relating to work under an existing transmission line or shifting of the transmission line | To be obtained by the preferred bidder |
| 14 | Grama Sabha consent | To be obtained by the preferred bidder |
| 15 | Any other clearances to start mining operation | To be obtained by the preferred bidder |

**PART C**

**PARTICULARS OF LAND**

| Sl. No. | Land Type | Area (in Hectares) |
|---|---|---|
| 1 | Total Concession Area | 299.82 Ha |
| 2 | Forest Land with Status | 14.053 Ha (As per PM Gatishakti Portal) |
| 3 | Government Land with Status | - |
| 4 | Private Land with Status | - |
| 5 | Revenue survey details of the area | - |

**Note:**

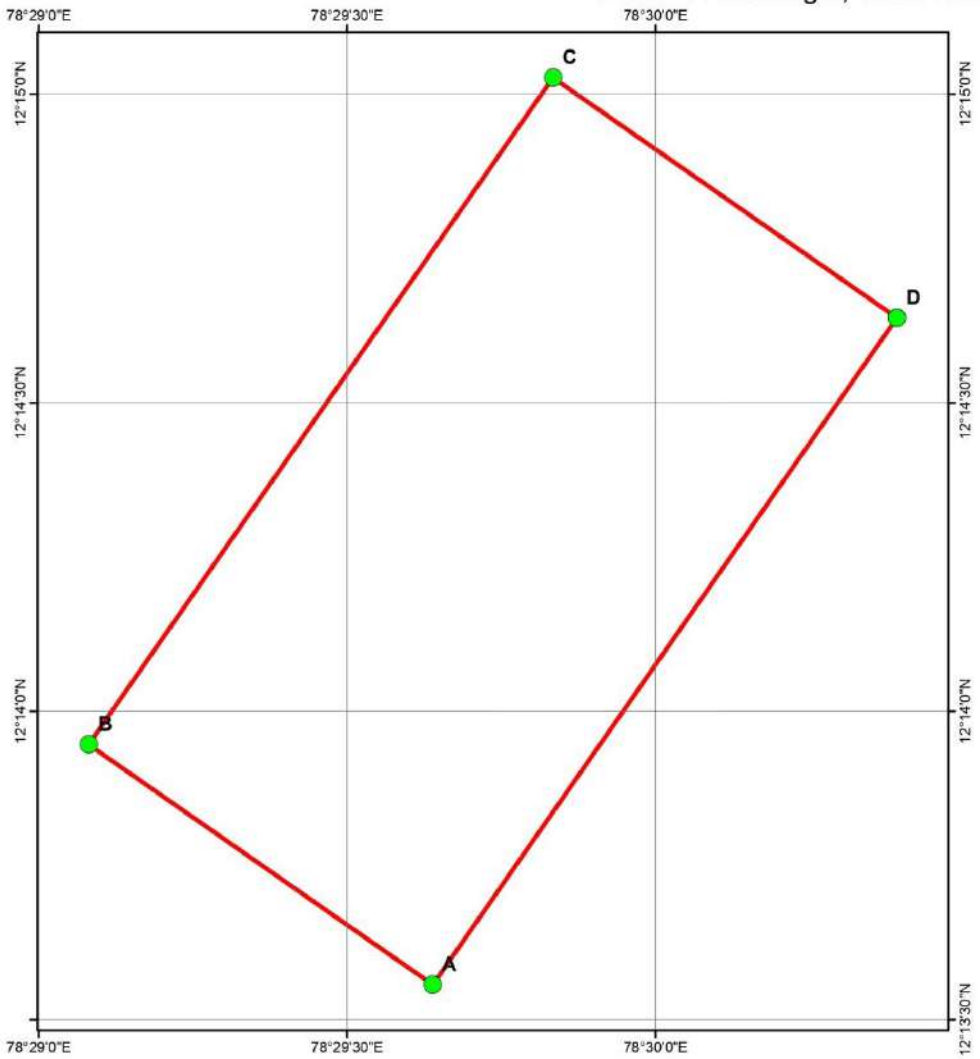
1. Mineral Block Summary has been prepared based on the available data in the Geological Report submitted by the exploration agency.
2. Co-ordinate of the block boundary has been considered from the geological report of the block.
3. Block area/ Concession area given in the mineral block summary is the calculated area of co-ordinates as provided in the Annexure-I.

**Annexure-I**

**Co-ordinates of Block Boundary Corner Points of Nochchipatti Molybdenum Block**

| Point | Latitude | Longitude |
|---|---|---|
| **A** | 12°13ˈ33.4ˈˈN | 78°29ˈ38.34ˈˈE |
| **B** | 12°13ˈ56.76ˈˈN | 78°29ˈ04.85ˈˈE |
| **C** | 12°15ˈ01.60ˈˈN | 78°29ˈ50.02ˈˈE |
| **D** | 12°14ˈ38.25ˈˈN | 78°30ˈ23.47ˈˈE |

Nochchipatti Molybdenum Block (299.82 ha), Village: Nochchipatti, Kanakampatti, Tehsil: Uttangarai, District: Krishnagiri, Tamil Nadu




N

| Coordinates of Corner Points of Nochchipatti Molybdenum Block, Krishnagiri District, Tamil | | | |
|---|---|---|---|
| Sl. No. | Points | Latitude | Longitude |
| 1 | A | 12° 13' 33.400" N | 78° 29' 38.340" E |
| 2 | B | 12° 13' 56.760" N | 78° 29' 4.850" E |
| 3 | C | 12° 15' 1.600" N | 78° 29' 50.020" E |
| 4 | D | 12° 14' 38.250" N | 78° 30' 23.470" E |

Part of Survey of India Toposheet No. 57L/08

1:12,500

0 0.175 0.35 0.7 1.05 1.4 Kilometers

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**Summary of the Mineral Block**

**PART A**

**GENERAL INFORMATION ABOUT MINERAL BLOCK**

| | Features | Details |
|---|---|---|
| 1 | **Location** | |
| | Mineral Block | **Velampatti North A&B Molybdenum Block** |
| i | Location | Block is bounded by,<br>Latitude: 12°5'52.876"N to 12°6'29.654"N<br>Longitude: 78°25'30.538''E to 78°26'1.157"E |
| ii | Corner Points (Latitude,Longitude) | Attached as Annexure-I |
| | Villages | Velampatti and Sundangipatti |
| | Tehsil/ Taluka | Harur |
| | District | Dharmapuri |
| | State | Tamil Nadu |
| 2 | **Area (hectares)** | |
| | Total Area of Block for Auction | 102.86 Ha |
| | Mineralised Area | - |
| | Non-mineralised area | - |
| 3 | **Exploration** | |
| | Status (G2/ G3/ G4 etc.) | G-3 (Preliminary exploration)<br>(Recommended for Composite License) |
| | Exploration Agency | Geological Survey of India, State Unit- Tamil Nadu and Puducherry |
| | Highlights of Geophysical and Geochemical Survey | Integrated study of geological and geochemical exploration depicts that, from south to central portion of the block is indicating a high chargeability for presence of sulphides in the shear zone. Although sub-surface data (drilling) indicated molybdenum mineralization for entire strike length in the block from south to north.<br>The geophysical borehole logging was carried out for seven boreholes and their demarcation of conductive zones are correlatable for 50% of the zones with mineralized lodes demarcated by chemical assay, rest are not matched, which could be due to varying concentration of molybdenum in the area. |
| | Highlights of Petrological Studies | It was studied during core logging and petrological studies that the wall rock alteration such as intensive silicified and propylitic alteration, which include mainly chloritic and potassic. This propylitic alteration assemblages include chlorite-quartz-sericite, which might have a strong genetic linkage with molybdenum mineralization. |
| | Drilling | 11 Nos of boreholes with total drilling meterage of 1434.10m. |
| | Borehole Density | 200m to 250m |
| | Trench and Pit | 25 no of pitting and trenching (50 cubic metres) |
| 4 | **Resources and Grade of Mineral** | |
| | Minerals | Molybdenum Ore |

| | Features | Details |
|---|---|---|
| | Total Inferred Resource (333) of Molybdenum Ore | |
| | • 2432110.59 tons or 2.43 m.t with Wt. average grade of 379ppm Mo at 0.01% cut off, (921.770 Tonnes Mo Metal Content)<br>• 583944.62 tons or 0.5839 m.t with Wt. average grade of 621 ppm Mo at 0.03% cut off, (362.630 Tonnes Mo metal Content)<br>• 273698.76 tons or 0.27 m.t with Wt. average grade of 744ppm Mo at 0.05% cut off, (203.632 Tonnes Mo metal Content) | |
| 5 | **Mineralised Zones** | |
| | Number of Mineral Zones | 05 lodes (Thickness varies from 1.5m to 4.2m) |
| | Trend (Dip and Strike) | The general foliation of the lithology of the block except in the shear zone is NNE-SSW with moderate to steeply (45° to 60°)dipping mostly towards southwest/ west. |
| | Justification | Based on the outcome of the present investigation, the molybdenum mineralization was intersected in almost all I and II level boreholes with nos. of lodes ranging from 1 to 4 for each borehole. To infer the details of the mining feasibility, detailed exploration is required. Hence block area is recommended for grant of Composite Licence. |
| 6 | **Accessibility** | |
| | Nearest Rail Head | Morappur |
| | Road | Velampatti North (VN) block is situated at about 1.5 km northwest of Velampatti village, which is 9 km from Harur, on the Harur-Morappur road. The Morappur - Harur state High way pass in the southern block. The investigation area can be approached from either Harur or from Morappur by road. |
| | Airport | Salem Airport |
| 7 | **Hydrography** | |
| | Local Surface Drainage Pattern | The perennial Ponniyar River is the major water source near by the current investigation block, which flows west to eastwards. Mostly dendritic pattern of drainage pattern is noticed in the investigation area. |
| | Rivers etc | |
| 8 | **Climate** | |
| | Mean Annual Rainfall | The average rainfall for the region varies 600mm to 700 mm. |
| | Temperature | The area has a typical tropical climate. Summer is very hot with temperature ranging from 35°C to 44°C. |
| | Temperature (June) | |
| 9 | **Topography** | |
| | Toposheet Number | 57 L/08 |
| | Morphology of the area | The area is a gently undulating terrain with a NNE-SSW ridge having a maximum elevation of 420m above mean sea level. |

**PART B**

**PARTICULARS OF STATUTORY LICENSE, PERMITS, PERMISSIONS, CONCESSIONS, APPROVALS AND CONSENTS RELATED TO MINING OPERATIONS**

| Sl.No. | Particulars | Details/ Status |
|---|---|---|
| 1 | Forest clearance | To be obtained by the preferred bidder |
| 2 | Wild life clearance (sanctuary, reserve or special zone clearances) | To be obtained by the preferred bidder |
| 3 | Environmental clearance | To be obtained by the preferred bidder |
| 4 | Mining plan approval | To be obtained by the preferred bidder |
| 5 | Consent to establish | To be obtained by the preferred bidder |
| 6 | Explosive license | To be obtained by the preferred bidder |
| 7 | Permission for mine opening | To be obtained by the preferred bidder |
| 8 | Permission of installation/ trial operation of equipment | To be obtained by the preferred bidder |
| 9 | Ground water clearance (Centre/State) | To be obtained by the preferred bidder |
| 10 | Railway siding approval | To be obtained by the preferred bidder |
| 11 | Approval for diesel storage | To be obtained by the preferred bidder |
| 12 | Power line from state Discom | To be obtained by the preferred bidder |
| 13 | Clearances relating to work under an existing transmission line or shifting of the transmission line | To be obtained by the preferred bidder |
| 14 | Grama Sabha consent | To be obtained by the preferred bidder |
| 15 | Any other clearances to start mining operation | To be obtained by the preferred bidder |

**PART C**

**PARTICULARS OF LAND**

| Sl. No. | Land Type | Area (in Hectares) |
|---|---|---|
| 1 | Total Concession Area | 102.86 Ha |
| 2 | Forest Land with Status | 72.9615 Ha (As per PM Gatishakti Portal) |
| 3 | Government Land with Status | - |
| 4 | Private Land with Status | - |
| 5 | Revenue survey details of the area | - |

**Note:**

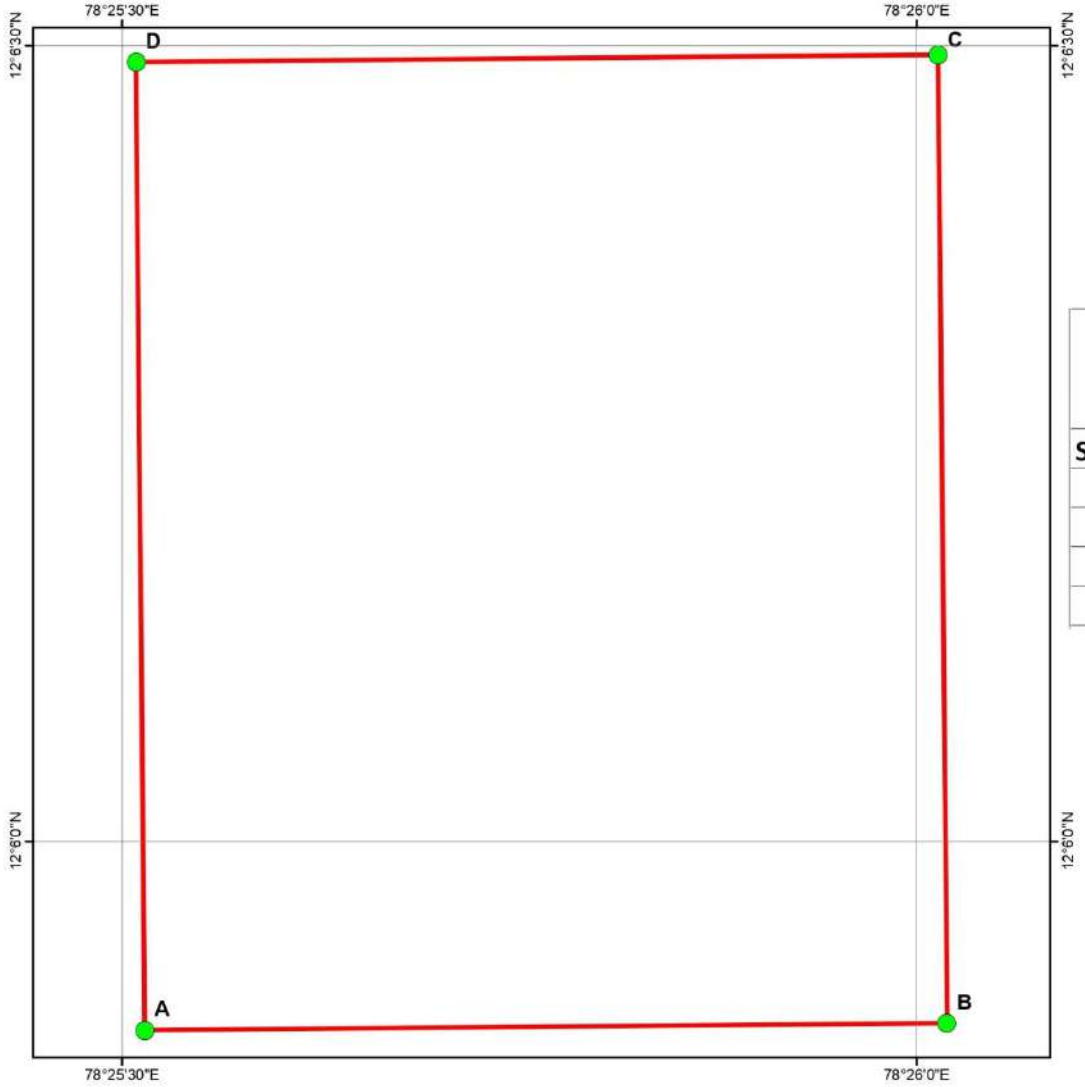
1. Mineral Block Summary has been prepared based on the available data in the Geological Report submitted by the exploration agency.
2. Co-ordinate of the block boundary has been considered from the geological report of the block.
3. Block area/ Concession area given in the mineral block summary is the calculated area of co-ordinates as provided in the Annexure-I.

**Annexure-I**

**Co-ordinates of Block Boundary Corner Points of Velampatti North A&B Molybdenum Block**

| Point | Latitude | Longitude |
|---|---|---|
| A | 12°05ˈ52.876ˈˈN | 78°25ˈ30.869ˈˈE |
| B | 12°05ˈ53.142ˈˈN | 78°26ˈ1.157ˈˈE |
| C | 12°06ˈ29.654ˈˈN | 78°26ˈ0.82ˈˈE |
| D | 12°06ˈ29.381ˈˈN | 78°25ˈ30.538ˈˈE |

Velampatti North A & B Molybdenum Block (102.86 ha), Village: Velampatti, Sundangipatti, Tehsil: Harur, District: Dharamapuri, Tamil Nadu




N

| Coordinates of Corner Points of Velampatti North A & B Molybdenum Block, Dharamapuri District, Tamil Nadu | | | |
|---|---|---|---|
| Sl. No. | Points | Latitude | Longitude |
| 1 | A | 12° 5' 52.876" N | 78° 25' 30.869" E |
| 2 | B | 12° 5' 53.142" N | 78° 26' 1.157" E |
| 3 | C | 12° 6' 29.654" N | 78° 26' 0.820" E |
| 4 | D | 12° 6' 29.381" N | 78° 25' 30.538" E |

Part of Survey of India Toposheet No. 57L/08

1:5,000

0 0.05 0.1 0.2 0.3 0.4 Kilometers

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**Summary of the Mineral Block**

**PART A**

**GENERAL INFORMATION ABOUT MINERAL BLOCK**

| | **Features** | **Details** |
|---|---|---|
| 1 | **Location** | |
| | Mineral Block | **Kurunjakulam Graphite Block** |
| i | Location | Block is bounded by,<br>Latitude: 9° 13' 40.000" N to 9° 14' 49.000" N<br>Longitude: 77° 40' 51.000" E to 77° 41' 32.000" E |
| ii | Corner Points (Latitude,Longitude) | Attached as Annexure-I |
| | Villages | Kurunjakulam |
| | Tehsil/ Taluka | Sankaran Koil |
| | District | Tenkasi |
| | State | Tamil Nadu |
| 2 | **Area (hectares)** | |
| | Total Area of Block for Auction | 265.66Ha |
| | Mineralised Area | - |
| | Non-mineralised area | - |
| 3 | **Exploration** | |
| | Status (G2/ G3/ G4 etc.) | G-4 ( Reconnaissance Survey)<br>(Recommended for Composite License) |
| | Exploration Agency | Geological Survey of India, State Unit- Tamil Nadu and Puducherry, Southern Region, Chennai |
| | Highlights of Geochemical Survey | 14 nos of samples indixated positive anomalies. Fixed carbon content in graphite gneiss which varies from 2.9 to 15.73% |
| | Highlights of Petrographic Studies | Under the microscope the rock is composed of graphite, calcite, feldspar and quartz and has a typical schistose texture. |
| | Drilling | No drilling carried out in the area. |
| | Borehole Density | No drilling carried out in the area. |
| | Trench and Pit | 22 nos of pitting (292.81 cum) |
| 4 | **Resources and Grade of Mineral** | |
| | Minerals | Graphite |
| | • Graphite (Reconnaissance Resource) expected to occur in three bands in the Kurunjakulam area to an assumed depth varying between 3 and 6 metres.<br>• Fixed carbon content in the rock which varies from 2.9 to 15.73% | |

| | Features | Details |
|---|---|---|
| 5 | **Mineralised Zones** | |
| | Number of Mineral Zones | - |
| | Trend (Dip and Strike) | The general strike of the rocks varies from NNW to NNE. with a dip around 60° in a general easterly direction. |
| | Extent of Mineralization | Graphite occurs in graphitic gneiss in the form of thin flakes of 2 to 3 mm in size as disseminations and is associated with quartz, Kaolinized feldspar and Kankar. No massive veins of pure graphite were encountered in any of the trenches put down in this area. The main band having strike length of 400 m in N-S direction with an average width of 1.5 m. The second band extends for a strike length of 400 m with an average width of 0.5 m. Another band of graphite gneiss having strike length of 120 m with an average width of 0.5 m. |
| | Justification | As per the data available in the report indicates the presence of graphite mineralization in the block area. The block may be recommended for putting for auction of composite license (CL) for up-gradation of level of exploration to assess the full economic potentiality of the graphite mineralization in the block. |
| 6 | **Accessibility** | |
| | Nearest Rail Head | Sankaran koil |
| | Road | Kurinjakulam is located about 18 kms. E.N.E. of Sankaran koil town which is the taluk headquarters and can be reached by motorable roads both from Sankaran koil and Kovilpatti via. Tiruvengadam. |
| | Airport | - |
| 7 | **Hydrography** | |
| | Local Surface Drainage Pattern | The Nichibanadhi and Uppodai rivers drain the area in a general northeasterly direction. |
| | Rivers etc | |
| 8 | **Climate** | |
| | Mean Annual Rainfall | 700mm to 750mm |
| | Temperature | The weather in Tenkasi in May is hot with a gentle breeze, with average highs of 90°F (32°C) and lows of 76°F (24°C). |
| | Temperature (June) | |
| 9 | **Topography** | |
| | Toposheet Number | 58 G/12 |
| | Morphology of the area | The area forms a part of the erstwhile Kuruvikulam Zamindari and is a plain country gently sloping towards north. |

**PART B**

**PARTICULARS OF STATUTORY LICENSE, PERMITS, PERMISSIONS, CONCESSIONS, APPROVALS AND CONSENTS RELATED TO MINING OPERATIONS**

| Sl.No. | Particulars | Details/ Status |
|---|---|---|
| 1 | Forest clearance | To be obtained by the preferred bidder |
| 2 | Wild life clearance (sanctuary, reserve or special zone clearances) | To be obtained by the preferred bidder |
| 3 | Environmental clearance | To be obtained by the preferred bidder |
| 4 | Mining plan approval | To be obtained by the preferred bidder |
| 5 | Consent to establish | To be obtained by the preferred bidder |
| 6 | Explosive license | To be obtained by the preferred bidder |
| 7 | Permission for mine opening | To be obtained by the preferred bidder |
| 8 | Permission of installation/ trial operation of equipment | To be obtained by the preferred bidder |
| 9 | Ground water clearance (Centre/State) | To be obtained by the preferred bidder |
| 10 | Railway siding approval | To be obtained by the preferred bidder |
| 11 | Approval for diesel storage | To be obtained by the preferred bidder |
| 12 | Power line from state Discom | To be obtained by the preferred bidder |
| 13 | Clearances relating to work under an existing transmission line or shifting of the transmission line | To be obtained by the preferred bidder |
| 14 | Grama Sabha consent | To be obtained by the preferred bidder |
| 15 | Any other clearances to start mining operation | To be obtained by the preferred bidder |

**PART C**

**PARTICULARS OF LAND**

| Sl. No. | Land Type | Area (in Hectares) |
|---|---|---|
| 1 | Total Concession Area | 265.66Ha |
| 2 | Forest Land with Status | - |
| 3 | Government Land with Status | - |
| 4 | Private Land with Status | - |
| 5 | Revenue survey details of the area | - |

**Note:**

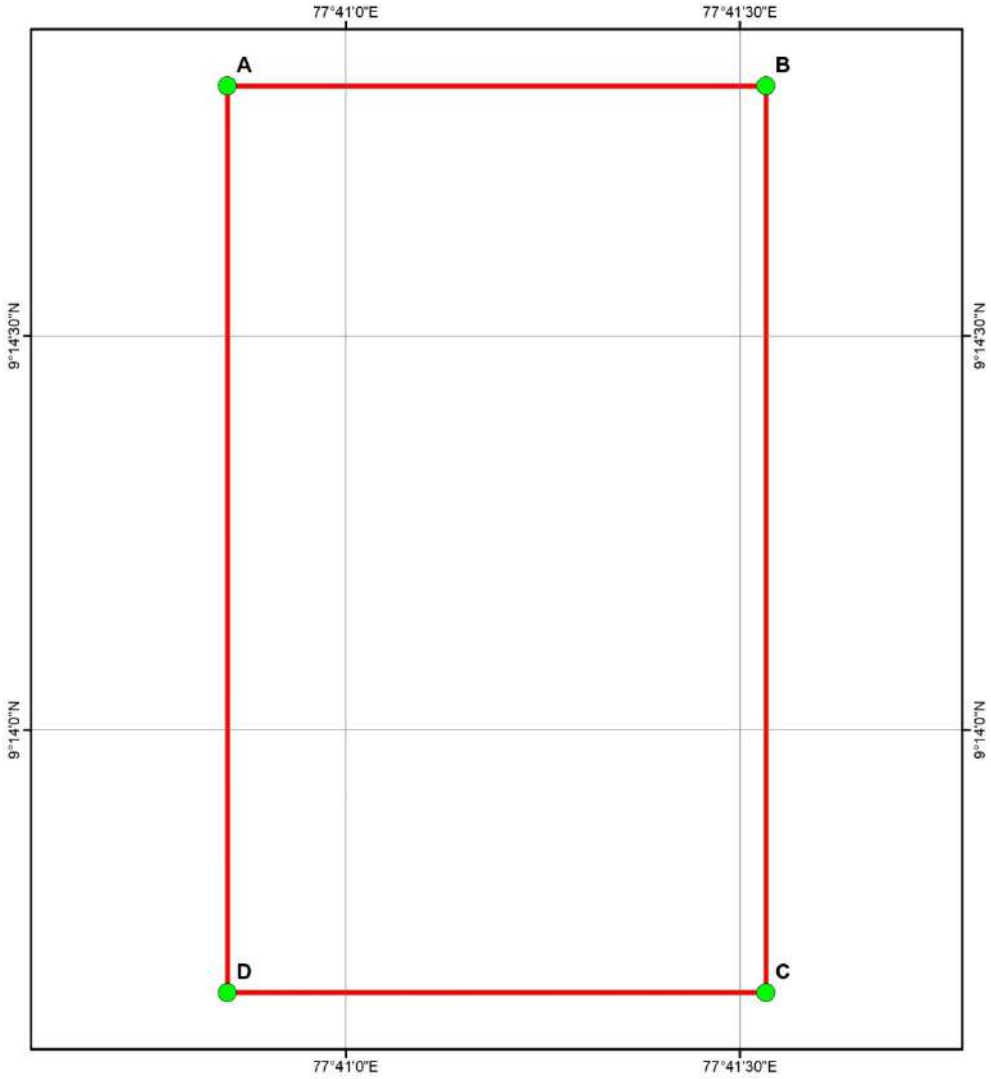
1. Mineral Block Summary has been prepared based on the available data in the Geological Memorandum (SR_TN_08_Kurunjakulam_III) and Geological Report submitted by the exploration agency.
2. Co-ordinate of the block boundary has been considered from the geological memorandum of the block.
3. Block area/ Concession area given in the mineral block summary is the calculated area of co-ordinates as provided in the Annexure-I.

**Annexure-I**

**Co-ordinates of Block Boundary Corner Points of Kurunjakulam Graphite Block**

| CARDINAL POINTS | Latitude | Longitude |
|---|---|---|
| A | 9° 14' 49.000" N | 77° 40' 51.000" E |
| B | 9° 14' 49.000" N | 77° 41' 32.000" E |
| C | 9° 13' 40.000" N | 77° 41' 32.000" E |
| D | 9° 13' 40.000" N | 77° 40' 51.000" E |

Kurunjakulam Graphite Block (265.66 ha), Village: Kurunjakulam, Tehsil: Sankaran Koi, District: Tenkasi, Tamil Nadu




N

| Coordinates of Corner Points of Kurunjakulam Graphite Block, Tenkasi District, Tamil Nadu | | | |
|---|---|---|---|
| Sl. No. | Points | Latitude | Longitude |
| 1 | A | 9° 14' 49.000" N | 77° 40' 51.000" E |
| 2 | B | 9° 14' 49.000" N | 77° 41' 32.000" E |
| 3 | C | 9° 13' 40.000" N | 77° 41' 32.000" E |
| 4 | D | 9° 13' 40.000" N | 77° 40' 51.000" E |

Part of Survey of India Toposheet No. 58G/12

1:10,000

0 0.125 0.25 0.5 0.75 1 Kilometers

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**Summary of the Mineral Block**

**PART A**

**GENERAL INFORMATION ABOUT MINERAL BLOCK**

| | Features | Details |
|---|---|---|
| 1 | **Location** | |
| | Mineral Block | **Iluppakudi Graphite Block** |
| i | Location | Block is bounded by,<br>Latitude: 9° 53' 29.760" N to 9° 54' 29.880" N<br>Longitude: 78° 20' 39.840" E to 78° 22' 30.000" E |
| ii | Corner Points (Latitude,Longitude) | Attached as Annexure-I |
| | Villages | Arasanur, Iluppakkudi, Kumaripatti |
| | Tehsil/ Taluka | |
| | District | Sivaganga |
| | State | Tamil Nadu |
| 2 | **Area (hectares)** | |
| | Total Area of Block for Auction | 633.36 Ha |
| | Mineralised Area | - |
| | Non-mineralised area | - |
| 3 | **Exploration** | |
| | Status (G2/ G3/ G4 etc.) | G-4 ( Reconnaissance Survey)<br>(Recommended for Composite License) |
| | Exploration Agency | Geological Survey of India, State Unit- Tamil Nadu and Puducherry, Southern Region, Chennai |
| | Highlights of Geochemical Survey | In Iluppakkudi area 10 BRS samples showing >2 % FC. Based on 167 trench samples from 15 trenches in Iluppakudi area indicates that the FC varies from 0.01% to 13.18 %. However, 30 trench samples showing >5 % FC. VM varies from 0.58% to 15.07%, moisture varies from 0.02% to 6.20%. |
| | Highlights of Petrographic Studies | The graphite shows bright metallic lusture under reflected light and occurs as subhedral to euhedral grains, flaky type, oriented along a preferred direction. Although graphite is associated with quartz, plagioclase feldspar, biotite but mostly associated along the boundary/within the quartz grain |
| | Drilling | No drilling carried out in the area. |
| | Borehole Density | No drilling carried out in the area. |
| | Trench and Pit | Trenching -20 nos (350 cum) |
| 4 | **Resources and Grade of Mineral** | |
| | Minerals | Graphite |

| | Features | Details |
|---|---|---|
| | Resources not estimated. | |
| 5 | **Mineralised Zones** | |
| | Number of Mineral Zones | - |
| | Trend (Dip and Strike) | The general trend of foliation observed in the area is ENE-WSW with dipping 70° to 80° towards southeast and rarely northerly. |
| | Extent of Mineralization | The graphite mineralisation is mainly controlled by lithology and structure. Graphite mineralisation reported in South West of Illuppakkudi, SE of Arasappanpatti and West of Panangadi villages associated with sheared quartzo-feldspathic rock, garnet biotite gneiss and sheared quartz. In Iluppakkudi area, discontinuous graphite occurrences noticed along WSW- ENE strike direction about 700 m long. Flaky nature of graphite mineralization concentrated in sheared portion of host rock in Illuppakkudi. |
| | Justification | As per the data available in the report indicates the presence of graphite mineralization in the block area. The block may be recommended for putting for auction of composite license (CL) for up-gradation of level of exploration to assess the full economic potentiality of the graphite mineralization in the block. |
| 6 | **Accessibility** | |
| | Nearest Rail Head | The nearest Railway station is Sivaganga on Trichy - Rameswaram Melur gauge section |
| | Road | The block area is well connected with district head quarter Sivaganga which is 10 km south-east, by Melur - Sivaganga state Highway, Sivaganga is well connected with state capital, Chennai by road as well as rail. |
| | Airport | Madurai |
| 7 | **Hydrography** | |
| | Local Surface Drainage Pattern | There is no perennial river in the investigated area expecting large number of tanks. |
| | Rivers etc | |
| 8 | **Climate** | |
| | Mean Annual Rainfall | 904.7mm. |
| | Temperature | The maximum temperature of 42˚-43˚C. The months of April and May are the hottest months and the cold weather prevails only during December – January. |
| | Temperature (June) | |
| 9 | **Topography** | |
| | Toposheet Number | 58 K/05 |
| | Morphology of the area | The area generally having plain topography. |

**PART B**

**PARTICULARS OF STATUTORY LICENSE, PERMITS, PERMISSIONS, CONCESSIONS, APPROVALS AND CONSENTS RELATED TO MINING OPERATIONS**

| Sl.No. | Particulars | Details/ Status |
|---|---|---|
| 1 | Forest clearance | To be obtained by the preferred bidder |
| 2 | Wild life clearance (sanctuary, reserve or special zone clearances) | To be obtained by the preferred bidder |
| 3 | Environmental clearance | To be obtained by the preferred bidder |
| 4 | Mining plan approval | To be obtained by the preferred bidder |
| 5 | Consent to establish | To be obtained by the preferred bidder |
| 6 | Explosive license | To be obtained by the preferred bidder |
| 7 | Permission for mine opening | To be obtained by the preferred bidder |
| 8 | Permission of installation/ trial operation of equipment | To be obtained by the preferred bidder |
| 9 | Ground water clearance (Centre/State) | To be obtained by the preferred bidder |
| 10 | Railway siding approval | To be obtained by the preferred bidder |
| 11 | Approval for diesel storage | To be obtained by the preferred bidder |
| 12 | Power line from state Discom | To be obtained by the preferred bidder |
| 13 | Clearances relating to work under an existing transmission line or shifting of the transmission line | To be obtained by the preferred bidder |
| 14 | Grama Sabha consent | To be obtained by the preferred bidder |
| 15 | Any other clearances to start mining operation | To be obtained by the preferred bidder |

**PART C**

**PARTICULARS OF LAND**

| Sl. No. | Land Type | Area (in Hectares) |
|---|---|---|
| 1 | Total Concession Area | 633.36 Ha |
| 2 | Forest Land with Status | - |
| 3 | Government Land with Status | - |
| 4 | Private Land with Status | - |
| 5 | Revenue survey details of the area | - |

**Note:**

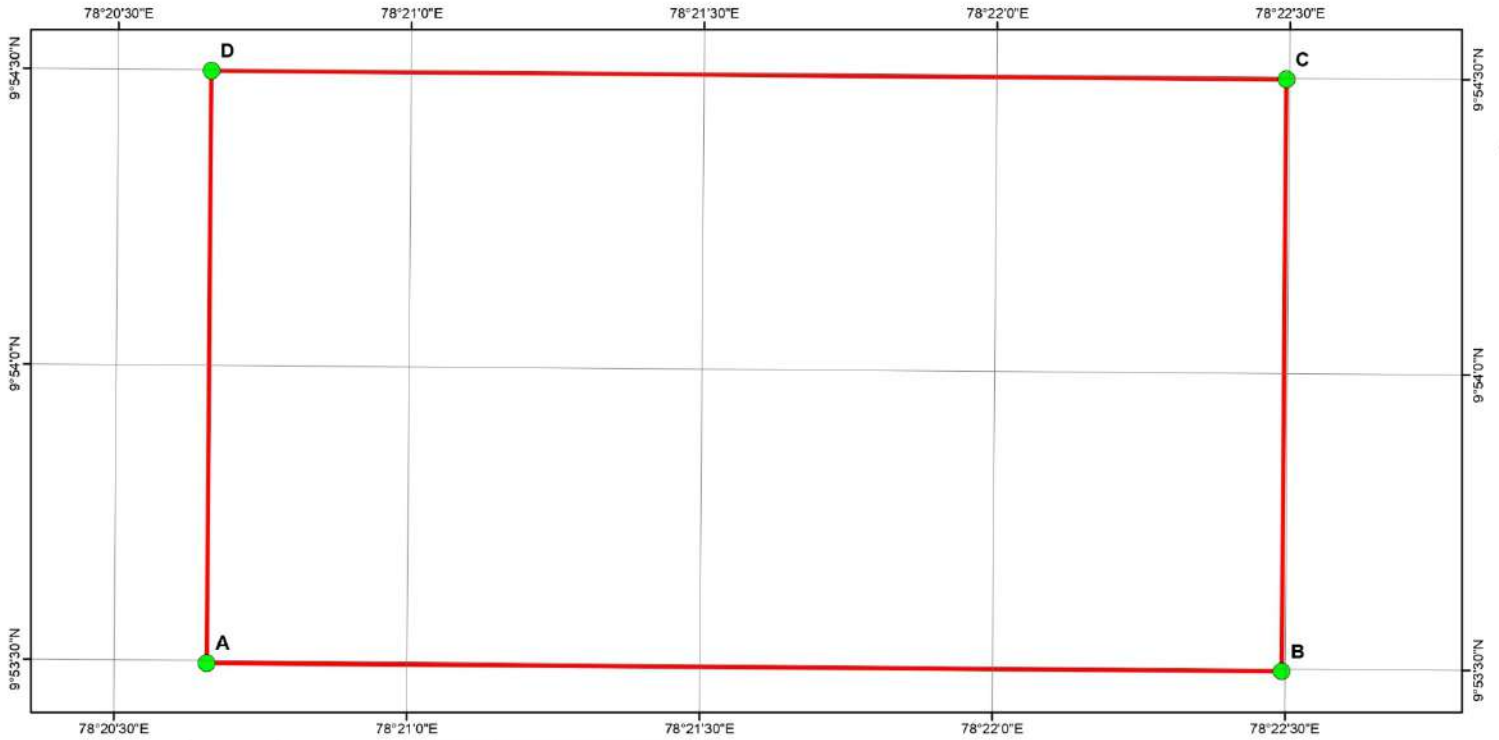
1. Mineral Block Summary has been prepared based on the available data in the Geological Memorandum (SR_TN_08_Iluppakudi_II) and Geological Report submitted by the exploration agency.
2. Co-ordinate of the block boundary has been considered from the geological memorandum of the block.
3. Block area/ Concession area given in the mineral block summary is the calculated area of co-ordinates as provided in the Annexure-I.

**Annexure-I**

**Co-ordinates of Block Boundary Corner Points of Iluppakudi Graphite Block**

| CARDINAL POINTS | Latitude | Longitude |
|---|---|---|
| A | 9° 53' 29.760" N | 78° 20' 39.840" E |
| B | 9° 53' 29.760" N | 78° 22' 30.000" E |
| C | 9° 54' 29.880" N | 78° 22' 30.000" E |
| D | 9° 54' 29.880" N | 78° 20' 39.840" E |

Iluppakudi Graphite Block (633.36 ha), Village: Arasanur, Illuppakkudi, Kumaripatti, District: Sivagangai, Tamil Nadu




| Coordinates of Corner Points of Iluppakudi Graphite Block, Sivagangai District, Tamil Nadu | | | |
|---|---|---|---|
| Sl. No. | Points | Latitude | Longitude |
| 1 | A | 9° 53' 29.760" N | 78° 20' 39.840" E |
| 2 | B | 9° 53' 29.760" N | 78° 22' 30.000" E |
| 3 | C | 9° 54' 29.880" N | 78° 22' 30.000" E |
| 4 | D | 9° 54' 29.880" N | 78° 20' 39.840" E |

Part of Survey of India Toposheet No. 58K/05

1:12,500

0 0.175 0.35 0.7 1.05 1.4 Kilometers

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**Summary of the Mineral Block**

**PART A**

**GENERAL INFORMATION ABOUT MINERAL BLOCK**

<table>
<tr><th></th><th>Features</th><th>Details</th></tr>
<tr><td>1</td><td>Location</td><td></td></tr>
<tr><td></td><td>Mineral Block</td><td>Mannadipatti Central Molybdenum Block</td></tr>
<tr><td>i</td><td>Location</td><td>The block is bounded by the<br>Latitudes: 12° 12’ 30.0” N to 12° 13’ 06.8” N and<br>Longitudes 78° 28’ 44.9” Eto 78° 29’ 08.0” E.</td></tr>
<tr><td>ii</td><td>Corner Points (Latitude,Longitude)</td><td>Co-ordinates of Block Corner Points:
<table>
<tr><th>Point ID</th><th>Latitude</th><th>Longitude</th></tr>
<tr><td>A</td><td>12° 13’ 06.8” N</td><td>78° 28’ 54.4” E</td></tr>
<tr><td>B</td><td>12° 13’ 00.6” N</td><td>78° 29’ 08.0” E</td></tr>
<tr><td>C</td><td>12° 12’ 42.8” N</td><td>78° 29’ 03.3” E</td></tr>
<tr><td>D</td><td>12° 12’ 30.0” N</td><td>78° 29’ 03.4” E</td></tr>
<tr><td>E</td><td>12° 12’ 31.1” N</td><td>78° 28’ 44.9” E</td></tr>
<tr><td>F</td><td>12° 12’ 53.8” N</td><td>78° 28’ 45.1” E</td></tr>
</table></td></tr>
<tr><td></td><td>Villages</td><td>Mannadipatti</td></tr>
<tr><td></td><td>Tehsil/ Taluka</td><td>Uttangarai</td></tr>
<tr><td></td><td>District</td><td>Krishnagiri</td></tr>
<tr><td></td><td>State</td><td>Tamil Nadu</td></tr>
<tr><td>2</td><td>Area (hectares)</td><td></td></tr>
<tr><td></td><td>Total Area of Block for Auction</td><td>58.68 Ha (0.6 sqkm as per Report)</td></tr>
<tr><td></td><td>Mineralised Area</td><td>3.00 Ha</td></tr>
<tr><td></td><td>Non-mineralised area</td><td>55.68 Ha</td></tr>
<tr><td>3</td><td>Exploration</td><td></td></tr>
<tr><td></td><td>Status (G2/ G3/ G4 etc.)</td><td>G-3 (Preliminary exploration)<br>(Recommended for Composite License)</td></tr>
<tr><td></td><td>Exploration Agency</td><td>Mineral Exploration and Consultancy Limited<br>(Formerly known as Mineral Exploration Corporation Limited), (A Govt. of India Enterprise - A Miniratna PSE), Dr. BabasahebAmbedkarBhavan, High Land Drive Road, Seminary Hills, Nagpur-440 006.</td></tr>
<tr><td></td><td>Drilling</td><td>Core drilling by GSI- 408.60m (4 boreholes)<br>Core drilling by MECL- 1221.00m (7 boreholes)<br>Total drilling- 1629.60m (11 boreholes)</td></tr>
<tr><td></td><td>Borehole Density</td><td>100m interval</td></tr>
<tr><td></td><td>Trench and Pit</td><td>Trenches – 15Nos (182cu.m)</td></tr>
<tr><td>4</td><td colspan="2">Quantity of Minerals (Grade wise)</td></tr>
<tr><td></td><td>Minerals</td><td>Molybdenum</td></tr>
<tr><td></td><td colspan="2">Geological Resources of Molybdenum</td></tr>
<tr><td></td><td colspan="2">The resource estimated by cross-section method is698578.667 Tonnes(0.699 million tonnes) with 0.031% Mo at 0.010% Mo cut off and 216.559 tonnes Mo metal content.</td></tr>
</table>

| | Features | Details |
|---|---|---|
| | The resource estimated by cross-section method is335001.373 Tonnes(0.335 million tonnes) with 0.055% Mo at 0.030% Mo cut off and 184.251 tonnes Mo metal content.<br>Total resource placed under inferred mineral resource (333) as per UNFC. | |
| 5 | **Mineralised Zones** | |
| | Number of Mineral Zones | There is a single lode L-I delineated in the block, which shows further splitting as L-IA, L-IB & L-IC in the strike and dip extensions. |
| | Trend (Dip and Strike) | The strike of foliation of the rock types varies from N-S to NE-SW in the block. The dips range from 70° to 75° towards east to southeast. |
| | Average thickness(m) | 2.50m |
| 6 | **Accessibility** | |
| | Nearest Rail Head | Uttangarai is the main railhead, about 13 km NNE of the exploration block. |
| | Road | The Mannadipatti Central Block is approachable by about 11 km fair weather metalled road from Hanumantheertham situated on the Uttangarai-Salem State Highway (SH-18) and is about 160 km from Bengaluru via NH-44 and about 265 Km from Chennai. |
| | Airport | The nearest airport is Bengaluru at a distance of 195 Km from the exploration block. |
| 7 | **Hydrography** | |
| | Local Surface Drainage Pattern | The area is drained by an ephemeral river Ponnaiyar, which has an easterly flow. It has several northeasterly and southeasterly flowing tributaries. |
| | Rivers etc | |
| 8 | **Climate** | |
| | Mean Annual Rainfall | The average rainfall for the region varies from 600mm to 700mm. |
| | Temperature | Winter temperature ranges from 17-20° C. Summer is very hot with temperature ranging from 35°C to 44°C. |
| | Temperature (June) | |
| 9 | **Topography** | |
| | Toposheet Number | 57 L/8 |
| | Morphology of the area | The area forms an undulating terrain with a number of NNE- SSW trending ridges, mounds and isolated hillocks. The general ground level drops from 400m above mean sea level (MSL) in the west to about 340m in the east. Maximum elevation of 397m above MSL is attained in the northwestern part of the Harur- Uttangarai Belt near Perumalnayakanpatti. |

**PART B**

**PARTICULARS OF STATUTORY LICENSE, PERMITS, PERMISSIONS, CONCESSIONS, APPROVALS AND CONSENTS RELATED TO MINING OPERATIONS**

| Sl.No. | Particulars | Details/ Status |
|---|---|---|
| 1 | Forest clearance | To be obtained by the preferred bidder |
| 2 | Wild life clearance (sanctuary, reserve or special zone clearances) | To be obtained by the preferred bidder |
| 3 | Environmental clearance | To be obtained by the preferred bidder |
| 4 | Mining plan approval | To be obtained by the preferred bidder |
| 5 | Consent to establish | To be obtained by the preferred bidder |
| 6 | Explosive license | To be obtained by the preferred bidder |
| 7 | Permission for mine opening | To be obtained by the preferred bidder |
| 8 | Permission of installation/ trial operation of equipment | To be obtained by the preferred bidder |
| 9 | Ground water clearance (Centre/State) | To be obtained by the preferred bidder |
| 10 | Railway siding approval | To be obtained by the preferred bidder |
| 11 | Approval for diesel storage | To be obtained by the preferred bidder |
| 12 | Power line from state Discom | To be obtained by the preferred bidder |
| 13 | Clearances relating to work under an existing transmission line or shifting of the transmission line | To be obtained by the preferred bidder |
| 14 | GramaSabha consent | To be obtained by the preferred bidder |
| 15 | Any other clearances to start mining operation | To be obtained by the preferred bidder |

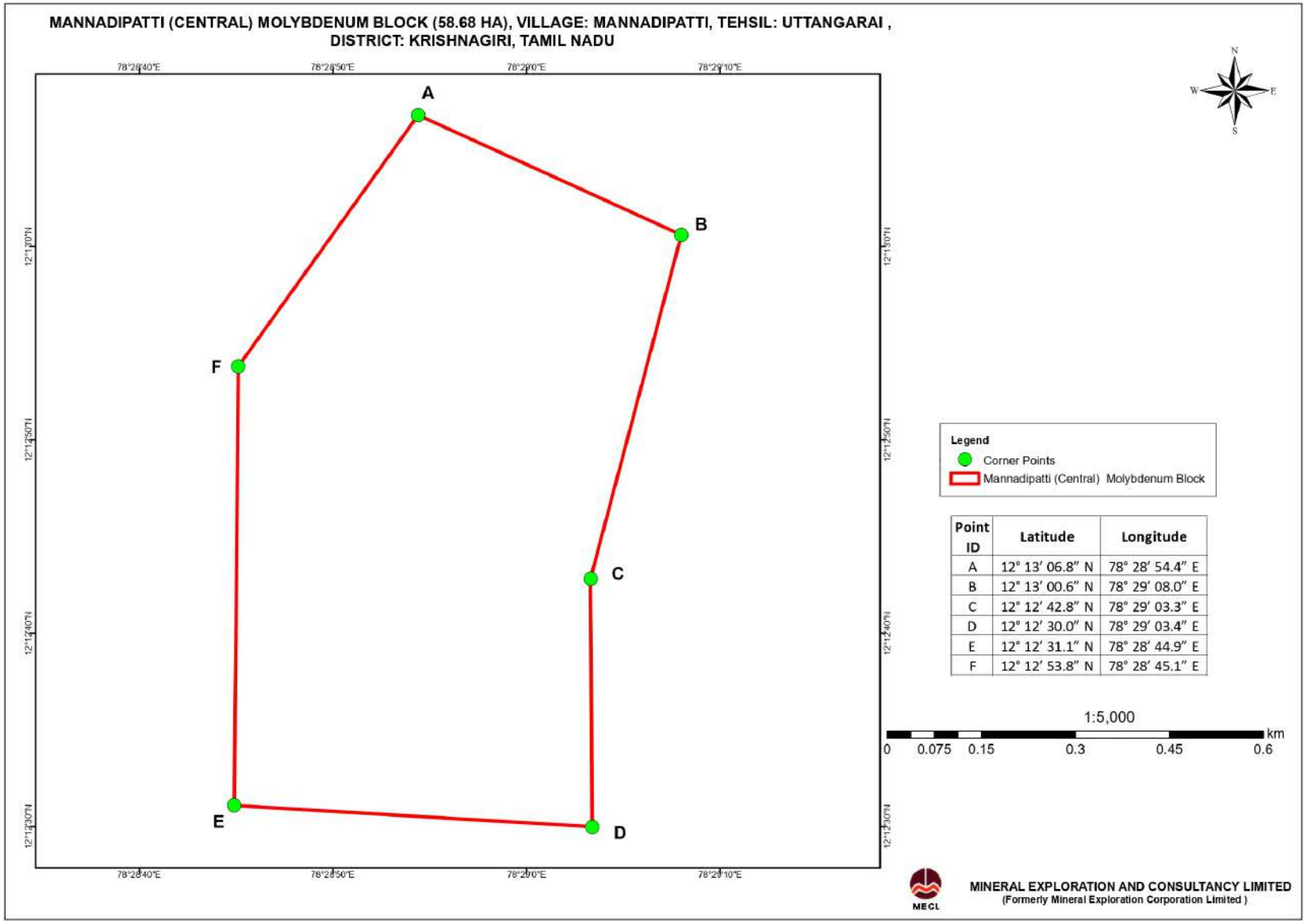
**PART C**

**PARTICULARS OF LAND**

| Sl. No. | Land Type | Area (in Hectares) |
|---|---|---|
| 1 | Total Concession Area | 58.68 Ha |
| 2 | Forest Land with Status | 41.4523 Ha (As per PM Gatishakti Portal) |
| 3 | Government Land with Status | - |
| 4 | Private Land with Status | - |
| 5 | Revenue survey details of the area | - |

**Note:**

1. Mineral Block Summary has been prepared based on the available data in the Geological Report submitted by the exploration agency.
2. Co-ordinate of the block boundary has been considered from the geological report of the block.
3. Block area/ Concession area given in the mineral block summary is the calculated area of co-ordinates as provided in the Annexure-I.


MANNADIPATTI (CENTRAL) MOLYBDENUM BLOCK (58.68 HA), VILLAGE: MANNADIPATTI, TEHSIL: UTTANGARAI ,
DISTRICT: KRISHNAGIRI, TAMIL NADU
78°28'40"E
78°28'50"E
78°29'0"E
78°29'10"E
12°13'0"N
12°12'50"N
12°12'40"N
12°12'30"N
A
B
C
D
E
F
N
W
E
S
Legend
Corner Points
Mannadipatti (Central) Molybdenum Block
Point ID
Latitude
Longitude
A
12° 13' 06.8" N
78° 28' 54.4" E
B
12° 13' 00.6" N
78° 29' 08.0" E
C
12° 12' 42.8" N
78° 29' 03.3" E
D
12° 12' 30.0" N
78° 29' 03.4" E
E
12° 12' 31.1" N
78° 28' 44.9" E
F
12° 12' 53.8" N
78° 28' 45.1" E
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km
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(Formerly Mineral Exploration Corporation Limited )

**Summary of the Mineral Block**

**PART A**

**GENERAL INFORMATION ABOUT MINERAL BLOCK**

| | Features | Details |
|---|---|---|
| 1 | **Location** | |
| | Mineral Block | **Marudipatti (Central) Molybdenum Block** |
| i | Location | The block is bounded by the<br>Latitudes: 12° 09’ 24.4729” N to 12° 9' 57.02825" N<br>Longitudes 78° 27’ 16.64903” E to 78° 27’ 33.75224” E. |
| ii | Corner Points (Latitude,Longitude) | Attached as Annexure-I |
| | Villages | Marudippatti, Tamaleripatti, Kilmorappur |
| | Tehsil/ Taluka | Harur |
| | District | Dharmapuri |
| | State | Tamil Nadu |
| 2 | **Area (hectares)** | |
| | Total Area of Block for Auction | 48.25 Ha (50.53Ha as per DGPS) |
| | Mineralised Area | - |
| | Non-mineralised area | - |
| 3 | **Exploration** | |
| | Status (G2/ G3/ G4 etc.) | G2 (General Exploration) |
| | Exploration Agency | Mineral Exploration and Consultancy Limited<br>(Formerly known as Mineral Exploration Corporation Limited), (A Govt. of India Enterprise - A Miniratna PSE), Dr. Babasaheb Ambedkar Bhavan, High Land Drive Road, Seminary Hills, Nagpur-440 006. |
| | Drilling | Core drilling by GSI- 1645.20m (14 boreholes)<br>Core drilling by MECL- 1335.00m (9 boreholes)<br>**Total drilling- 2980.20m (23 boreholes)** |
| | Borehole Density | 50m close interval |
| | Trench and Pit | 226 cu m of trenching (9 trenches) |
| 4 | **Quantity of Minerals (Grade wise)** | |
| | Minerals | Molybdenum |
| | **Geological Resources of Molybdenum** | |

**Resource at 0.01% Mo cut-off**

| Measured (331) | | Indicated (332) | | Inferred (333) | | Total | | Mo Metal Content (Tonnes) |
|---|---|---|---|---|---|---|---|---|
| Resource (Tonnes) | Grade (Mo %) | Resource (Tonnes) | Grade (Mo %) | Resource (Tonnes) | Grade (Mo %) | Resource (Tonnes) | Grade (Mo %) | |
| 842316.488 | 0.039 | 1080439 | 0.032 | 171608 | 0.043 | 2094363 | 0.036 | 753.971 |

<table>
<tr><td></td><td>Features</td><td colspan="9">Details</td></tr>
<tr><td></td><td colspan="10">
<table>
<tr><td colspan="9">Resource at 0.03% Mo cut-off</td></tr>
<tr><td>Resource (Tonnes)</td><td>Grade (Mo %)</td><td>Resource (Tonnes)</td><td>Grade (Mo %)</td><td>Resource (Tonnes)</td><td>Grade (Mo %)</td><td>Resource (Tonnes)</td><td>Grade (Mo %)</td><td>Mo Metal Content (Tonnes)</td></tr>
<tr><td>383651.118</td><td>0.065</td><td>398906.4</td><td>0.059</td><td>93127.4</td><td>0.07</td><td>875684.9</td><td>0.063</td><td>551.681</td></tr>
</table>
</td></tr>
<tr><td>5</td><td>Mineralised Zones</td><td colspan="9"></td></tr>
<tr><td></td><td>Number of Mineral Zones</td><td colspan="9">There is a single loe L-I delineated in the block, which shows further splitting as L-IA, L-IB (L-IB1 & L-IB2) in the strike and dip extensions.</td></tr>
<tr><td></td><td>Trend (Dip and Strike)</td><td colspan="9">The mineralised zone in the block prominently trends to N-S to N20°E–S20°W with minor warping along the shear zone over a strike length of 840.00m, having an average width of 6.00 m. The identified mineralised zones in general shows an average dip of 45° to 50° from horizontal and narrowing down depth.</td></tr>
<tr><td></td><td>Average thickness(m)</td><td colspan="9">Ranges from 0.42m to 22.13m</td></tr>
<tr><td>6</td><td>Accessibility</td><td colspan="9"></td></tr>
<tr><td></td><td>Nearest Rail Head</td><td colspan="9">Morappur</td></tr>
<tr><td></td><td>Road</td><td colspan="9">The block can be approached by Morappur-Echampadi motorable road and is approachable from Echampadi (9 km) or (11 km) from Morappur via Pariayapatti.</td></tr>
<tr><td></td><td>Airport</td><td colspan="9">The nearest airport is Chennai at a distance of 190 Km from the exploration block.</td></tr>
<tr><td>7</td><td>Hydrography</td><td colspan="9"></td></tr>
<tr><td></td><td>Local Surface Drainage Pattern</td><td colspan="9" rowspan="2">The area is characterised by dendritic drainage pattern with a number of small streams and nalas originating from the high altitude areas and draining into lakes and ponds.<br>Ponnaiyar River drains in the central part of the study area flowing easterly, whereas Vaniyar river drains in the southeastern part of the study area flows northeasterly.</td></tr>
<tr><td></td><td>Rivers etc</td></tr>
<tr><td>8</td><td>Climate</td><td colspan="9"></td></tr>
<tr><td></td><td>Mean Annual Rainfall</td><td colspan="9">The average rainfall in the area is 87.61 cm.</td></tr>
<tr><td></td><td>Temperature</td><td colspan="9" rowspan="2">During summer the temperature rises upto 41.4°C, while its falls down to 10.6°C in winter.</td></tr>
<tr><td></td><td>Temperature (June)</td></tr>
<tr><td>9</td><td>Topography</td><td colspan="9"></td></tr>
<tr><td></td><td>Toposheet Number</td><td colspan="9">Survey of India Toposheet No.57L/8.</td></tr>
<tr><td></td><td>Morphology of the area</td><td colspan="9">The exploration block, the ground elevation varies from 354mRL to 386mRL. The relief is about 20-32m from the general ground level.</td></tr>
</table>

## PART B

## PARTICULARS OF STATUTORY LICENSE, PERMITS, PERMISSIONS, CONCESSIONS, APPROVALS AND CONSENTS RELATED TO MINING OPERATIONS

| Sl.No. | Particulars | Details/ Status |
|---|---|---|
| 1 | Forest clearance | To be obtained by the preferred bidder |
| 2 | Wild life clearance (sanctuary, reserve or special zone clearances) | To be obtained by the preferred bidder |
| 3 | Environmental clearance | To be obtained by the preferred bidder |
| 4 | Mining plan approval | To be obtained by the preferred bidder |
| 5 | Consent to establish | To be obtained by the preferred bidder |
| 6 | Explosive license | To be obtained by the preferred bidder |
| 7 | Permission for mine opening | To be obtained by the preferred bidder |
| 8 | Permission of installation/ trial operation of equipment | To be obtained by the preferred bidder |
| 9 | Ground water clearance (Centre/State) | To be obtained by the preferred bidder |
| 10 | Railway siding approval | To be obtained by the preferred bidder |
| 11 | Approval for diesel storage | To be obtained by the preferred bidder |
| 12 | Power line from state Discom | To be obtained by the preferred bidder |
| 13 | Clearances relating to work under an existing transmission line or shifting of the transmission line | To be obtained by the preferred bidder |
| 14 | Grama Sabha consent | To be obtained by the preferred bidder |
| 15 | Any other clearances to start mining operation | To be obtained by the preferred bidder |

## PART C

## PARTICULARS OF LAND

| Sl. No. | Land Type | Area (in Hectares) |
|---|---|---|
| 1 | Total Concession Area | 48.25 Ha (50.53Ha as per DGPS) |
| 2 | Forest Land with Status | 38.4051 Ha |
| 3 | Government Land with Status | - |
| 4 | Private Land with Status | 9.8449 Ha |
| 5 | Revenue survey details of the area | - |

**Note:**

1. Mineral Block Summary has been prepared based on the available data in the Geological Report submitted by the exploration agency.
2. Co-ordinate of the block boundary has been considered after DGPS Survey of the boundary corner points of the block.
3. With respect to the DGPS boundary co-ordinates the total block area is 50.53 Ha. But as per revenue record of the area is 48.25 Ha. Hence, the total block area as indicated in the revenue record 48.25 Ha is taken as final block area. This ambiguity of area is purely with respect to revenue information available inside DGPS block boundary and all the reporting has to be done as per available revenue record.
4. The extent of the different land types mentioned above in "PART C" has been considered from the Prime Minister Gati Shakti portal and land record portal of the State Government. The actual status of the land classification and extent of individual land will be as per the concerned government department.

Annexure-I

**DGPS Co-ordinates of Block Corner Points of Marudipatti (Central) Molybdenum Block**

| CARDINAL POINTS | Latitude | Longitude |
|---|---|---|
| A | 12° 9' 56.87980" N | 78° 27' 16.64903" E |
| B | 12° 9' 57.02825" N | 78° 27' 33.45117" E |
| C | 12° 9' 24.71939" N | 78° 27' 33.75224" E |
| D | 12° 9' 24.4729" N | 78° 27' 16.9703 " E |

**Summary of the Mineral Block**

**PART A**

**GENERAL INFORMATION ABOUT MINERAL BLOCK**

| | Features | Details |
|---|---|---|
| 1 | **Location** | |
| | Mineral Block | **Kurchha Glauconite Block** |
| i | Location | Block is bounded by,<br>Latitude: 24° 35 27.27" N to 24° 35' 43.69" N<br>Longitude : 82° 52' 26.10" E to 82° 52' 40.91" E |
| ii | Corner Points (Latitude,Longitude) | Attached as Annexure-1. |
| | Villages | Kurchha, Ghoriya |
| | Tehsil/ Taluka | Obra |
| | District | Sonbhadra |
| | State | Uttar Pradesh |
| 2 | **Area (hectares)** | |
| | Total Area of Block for Auction | 17.30 Ha |
| | Mineralised Area | 8.00 Ha |
| | Non-mineralised area | 9.30 Ha |
| 3 | **Exploration** | |
| | Status (G2/ G3/ G4 etc.) | G-2 (General Exploration)<br>(Recommended for Composite License) |
| | Exploration Agency | Geological Survey of India, State Unit- Uttar Pradesh |
| | Drilling | 08 nos of boreholes with total drilling meterage of 280m.<br>Vertical Boreholes. |
| | Borehole Density | 100 m x 100 m grid pattern |
| | Trench and Pit | - |
| 4 | **Resources and Grade of Mineral** | |
| | Minerals | Glauconite |
| | Indicated Mineral Resource (332) of Glauconite is 1.8538 million tonnes with an average grade of 5.9569 % of potash (K2O) in ≥3% $K_2O$ cutoff grade over a strike length of 100m. | |
| 5 | **Mineralised Zones** | |
| | Number of Mineral Zones | 3 Zones |
| | Trend (Dip and Strike) | Attitude of the glauconitic sandstone beds are N65°W –S65°E to E-W with gentle dip (10°-30°) towards NE and north direction respectively. |
| | Extent of Mineralization | Exposure of glauconite mineralised zone had been delineated in Kurchha block, glauconite beds had been delineated on the surface having a strike length of over 200 m with an average width of 15-20 m. |
| | Justification | Based on the surface and sub surface observations made during the investigation and the encouraging values obtained from chemical analysis of the samples from the area, the area seems to be moderately promising for potash mineralisation and is recommended for taking up next stage of investigation/exploration. The block may be recommended |

| | Features | Details |
|---|---|---|
| | | for putting for auction of composite license (CL) for up-gradation of level of exploration to assess the full economic potentiality of the Glauconite mineralization in the block. |
| 6 | **Accessibility** | |
| | Nearest Rail Head | The nearest railway station is Chopan which is 28 km from the area. |
| | Road | The area can easily be approached by road from Varanasi and Mirzapur via Chopan. Semiya, Bargawan, Kurchha, Barwadih and Patwadh are important localities around the area of investigation |
| | Airport | Varanasi |
| 7 | **Hydrography** | |
| | Local Surface Drainage Pattern | The drainage pattern of the area is mainly dendritic. Son River and its tributaries form the major drainage system in the area. |
| | Rivers etc | |
| 8 | **Climate** | |
| | Mean Annual Rainfall | 1036.6 mm |
| | Temperature | The temperature varies from 30°C to 44°C in the summer and 2 °C to 15°C in the winter. |
| | Temperature (June) | |
| 9 | **Topography** | |
| | Toposheet Number | Survey of India Toposheet No- 63L/14 |
| | Morphology of the area | Physiographically, the area can be divided into three geomorphic sub-divisions i.e. i) plateau and table and topography, ii) Son valley along Son river and iii) isolated hills and jungle covered ravines The height of the plateau ranges from approximate 250-400 m above mean sea level whereas the valley of Son Rivers has elevation 150-200 m. The area toward south of Son valley is marked by hills, valley and forests with an elevation ranging from 200-400 m. |

**PART B**

**PARTICULARS OF STATUTORY LICENSE, PERMITS, PERMISSIONS, CONCESSIONS, APPROVALS AND CONSENTS RELATED TO MINING OPERATIONS**

| Sl.No. | Particulars | Details/ Status |
|---|---|---|
| 1 | Forest clearance | To be obtained by the preferred bidder |
| 2 | Wild life clearance (sanctuary, reserve or special zone clearances) | To be obtained by the preferred bidder |
| 3 | Environmental clearance | To be obtained by the preferred bidder |
| 4 | Mining plan approval | To be obtained by the preferred bidder |
| 5 | Consent to establish | To be obtained by the preferred bidder |
| 6 | Explosive license | To be obtained by the preferred bidder |
| 7 | Permission for mine opening | To be obtained by the preferred bidder |
| 8 | Permission of installation/ trial operation of equipment | To be obtained by the preferred bidder |
| 9 | Ground water clearance (Centre/State) | To be obtained by the preferred bidder |
| 10 | Railway siding approval | To be obtained by the preferred bidder |
| 11 | Approval for diesel storage | To be obtained by the preferred bidder |
| 12 | Power line from state Discom | To be obtained by the preferred bidder |
| 13 | Clearances relating to work under an existing transmission line or shifting of the transmission line | To be obtained by the preferred bidder |
| 14 | Grama Sabha consent | To be obtained by the preferred bidder |
| 15 | Any other clearances to start mining operation | To be obtained by the preferred bidder |

**PART C**

**PARTICULARS OF LAND**

| Sl. No. | Land Type | Area (in Hectares) |
|---|---|---|
| 1 | Total Concession Area | 17.30 Ha |
| 2 | Forest Land with Status | 3.385 Ha |
| 3 | Government Land with Status | 2.174 Ha |
| 4 | Private Land with Status | 11.741 Ha |
| 5 | Revenue survey details of the area | - |

**Note:**

1. Mineral Block Summary has been prepared based on the available data in the Geological Report submitted by the exploration agency.
2. Block area/ Concession area given in the mineral block summary is the calculated area of co-ordinates as provided in the Annexure-I.

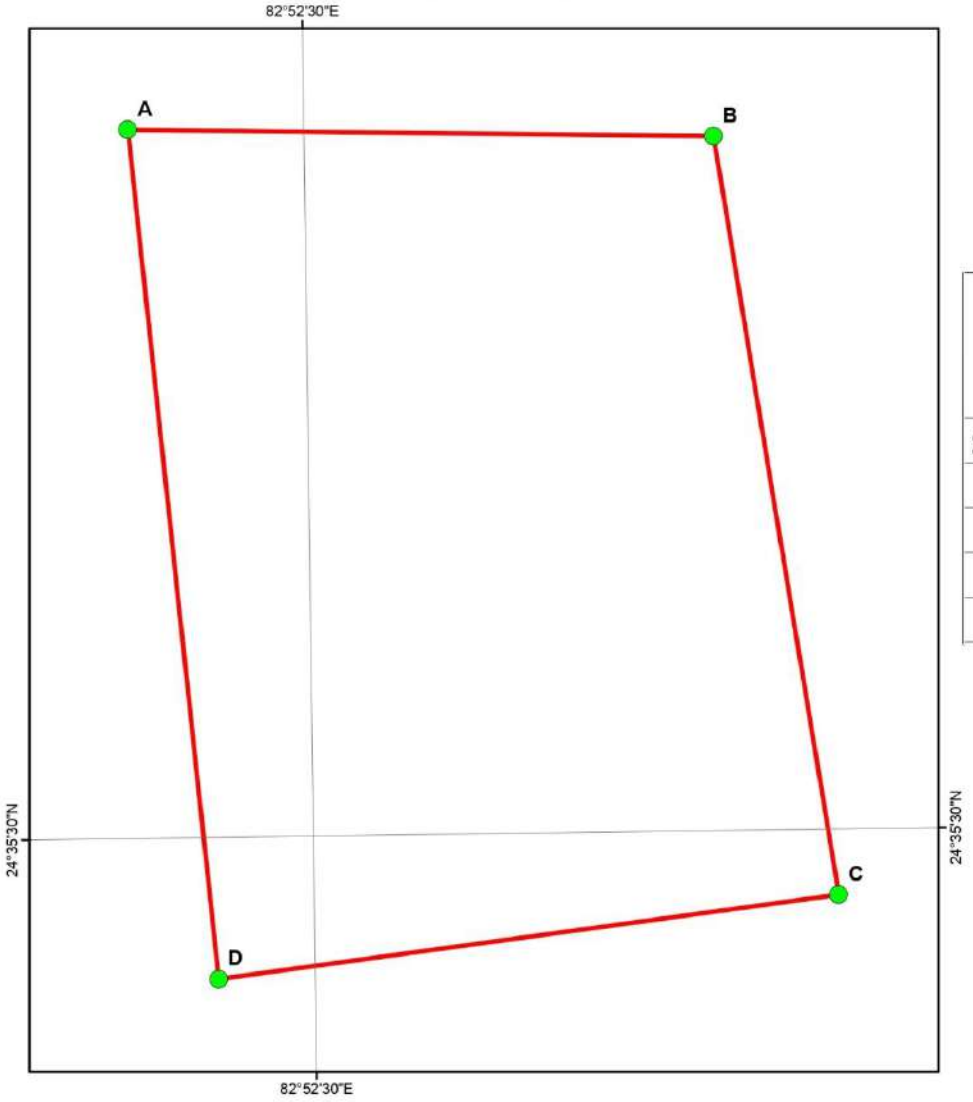
***

**Annexure-I**

## Co-ordinates of Block Boundary of Kurchha Glauconite Block

| Point | Latitude | Longitude |
|---|---|---|
| A | 24° 35’ 43.69" | 82° 52' 26.10" |
| B | 24° 35’ 43.41" | 82° 52'38.48" |
| C | 24° 35’ 28.73" | 82° 52'40.91" |
| D | 24° 35’ 27.27" | 82° 52'27.78" |

## Kurchha Glauconite Block (17.30 ha), Village: Kurchha, Tehsil: Obra, District: Sonbhadra, Uttar Pradesh




N

| Coordinates of Corner Points of Kurchha Glauconite Block, Sonbhadra District, Uttar Pradesh | | | |
|---|---|---|---|
| **Sl. No.** | **Points** | **Latitude** | **Longitude** |
| 1 | A | 24°35'43.69" N | 82°52'26.10" E |
| 2 | B | 24°35'43.41" N | 82°52'38.48" E |
| 3 | C | 24°35'28.73" N | 82°52'40.91" E |
| 4 | D | 24°35'27.27" N | 82°52'27.78" E |

Part of Survey of India Toposheet No. 63L/14

1:2,500

0 0.035 0.07 0.14 0.21 0.28 Kilometers

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Ministry of Mines, Govt of India Enterprise, MINIRATNA-I CPSE
An ISO 9001:2015, 14001:2015 & 45001:2018 Certified Company

**Summary of the Mineral Block**

**PART A**

**GENERAL INFORMATION ABOUT MINERAL BLOCK**

| | **Features** | **Details** |
|---|---|---|
| 1 | **Location** | |
| | Mineral Block | **Pahadi Kalan-Gora Kalan Phosphorite Block** |
| i | Location | Block Area is bounded by the<br>Latitude : 24° 18' 30.71"N to 24° 19' 32.02"N and<br>Longitude : 78° 42' 53.41"E to 78° 48' 17.29"E |
| ii | Corner Points (Latitude, Longitude) | Attached as Annexure-I |
| | Villages | Sonrai, Jalandhar, Pahadi Kalan, Gora Kalan, Piprat, Bamhori Kalan and Pisnari |
| | Tehsil/ Taluka | Madawara |
| | District | Lalitpur |
| | State | Uttar Pradesh |
| 2 | **Area (hectares)** | |
| | Total Area of Block for Auction | 1393.83 Ha |
| | Mineralised Area | 78.95 Ha |
| | Non-mineralised area | 1314.88 Ha |
| 3 | **Exploration** | |
| | Status (G2/ G3/ G4 etc.) | G-3 (Preliminary Exploration)<br>Recommended for Composite License |
| | Exploration Agency | Mineral Exploration and Consultancy Limited (Formerly known as Mineral Exploration Corporation Limited), (A Govt. of India Enterprise - A Miniratna PSE), Dr. Babasaheb Ambedkar Bhavan, High Land Drive Road, Seminary Hills, Nagpur-440 006. |
| | Drilling | 11 Core Boreholes (Total drilling meterage - 1019 m) |
| | Borehole Spacing | 800m interval |
| | Trench and Pit | Trenching- 246 cu.m. |
| 4 | **Quantity of Minerals (Grade wise)** | |
| | Minerals | Phosphorite |
| | **Summary of Grade wise Resource for Phosphorite with average grade** | |

| **Grade** | **Gross In-situ Resource (Tonnes)** | **Net In-situ Resource (Tonnes)** | **Average Grade (%)** |
|---|---|---|---|
| | | | **$P_2O_5$ %** |
| **BENEFICIABLE (5% to 16% $P_2O_5$)** | 20,774,723.47 | 16619778.776 | 8.66 |
| **SOIL RECLAMATION (16% to 25% $P_2O_5$)** | 3,083,112.91 | 2466490.326 | 17.68 |
| **TOTAL RESOURCE (333)** | 23,857,836.38 | 19086269.102 | 9.83 |
| | **23.85 mt** | **19.08 mt** | **9.83** |

| | Features | Details |
|---|---|---|
| 5 | **Mineralised Zones** | |
| | Number of Mineral Zones | - |
| | Trend (Dip and Strike) | General Strike of the ore body is N80°W - S80°E and dipping 30° towards S10°W. |
| | Justification | Present exploration of the block is carried out under G-3 stage and it can be further upgraded to G-2 stage for better geological confidence. |
| 6 | **Accessibility** | |
| | Nearest Rail Head | Lalitpur Railway Station (72 km), |
| | Road | Block is located about 70km south east from Lalitpur, which is the district headquarter of Lalitpur district. The nearest town is Madawara (9 km) and Mahrauni (34 km). The area is well connected with motorable/ metalled road. |
| | Airport | Bhopal (M.P)- approx 250 km. (Lalitpur airport under construction) |
| 7 | **Hydrography** | |
| | Local Surface Drainage Pattern | Drainage pattern of the area is of dendritic type. Major rivers are the Jamuni and Dhasan flowing through the western and eastern part of the block area respectively. |
| | Rivers etc | |
| 8 | **Climate** | |
| | Mean Annual Rainfall | The average annual rainfall in the area is 940 to 1000 mm. |
| | Temperature (January) | The area experiences hot climate during summer and cold during winter with temperature generally ranging from 18°C to 21°C in winter (January) and 32°C to 43°C in summer (May-June). |
| | Temperature (June) | |
| 9 | **Topography** | |
| | Toposheet Number | Survey of India Toposheet No- 54 L/11 and 54 L/15 |
| | Morphology of the area | The general surface level of the flat lying regions in the block area is 400 meter above the mean sea level, with low hills and mounds rising up to 440 in the eastern part of the block. Further south. |

**PART B**

**PARTICULARS OF STATUTORY LICENSE, PERMITS, PERMISSIONS, CONCESSIONS, APPROVALS AND CONSENTS RELATED TO MINING OPERATIONS**

| Sl.No. | Particulars | Details/ Status |
|---|---|---|
| 1 | Forest clearance | To be obtained by the preferred bidder |
| 2 | Wild life clearance (sanctuary, reserve or special zone clearances) | To be obtained by the preferred bidder |
| 3 | Environmental clearance | To be obtained by the preferred bidder |
| 4 | Mining plan approval | To be obtained by the preferred bidder |
| 5 | Consent to establish | To be obtained by the preferred bidder |
| 6 | Explosive license | To be obtained by the preferred bidder |
| 7 | Permission for mine opening | To be obtained by the preferred bidder |
| 8 | Permission of installation/ trial operation of equipment | To be obtained by the preferred bidder |
| 9 | Ground water clearance (Centre/State) | To be obtained by the preferred bidder |
| 10 | Railway siding approval | To be obtained by the preferred bidder |
| 11 | Approval for diesel storage | To be obtained by the preferred bidder |
| 12 | Power line from state Discom | To be obtained by the preferred bidder |
| 13 | Clearances relating to work under an existing transmission line or shifting of the transmission line | To be obtained by the preferred bidder |
| 14 | Grama Sabha consent | To be obtained by the preferred bidder |
| 15 | Any other clearances to start mining operation | To be obtained by the preferred bidder |

**PART C**

**PARTICULARS OF LAND**

| Sl. No. | Land Type | Area (in Hectares) |
|---|---|---|
| 1 | Total Concession Area | 1393.83 Ha |
| 2 | Forest Land with Status | - |
| 3 | Government Land with Status | - |
| 4 | Private Land with Status | - |
| 5 | Revenue survey details of the area | - |

**Note:**

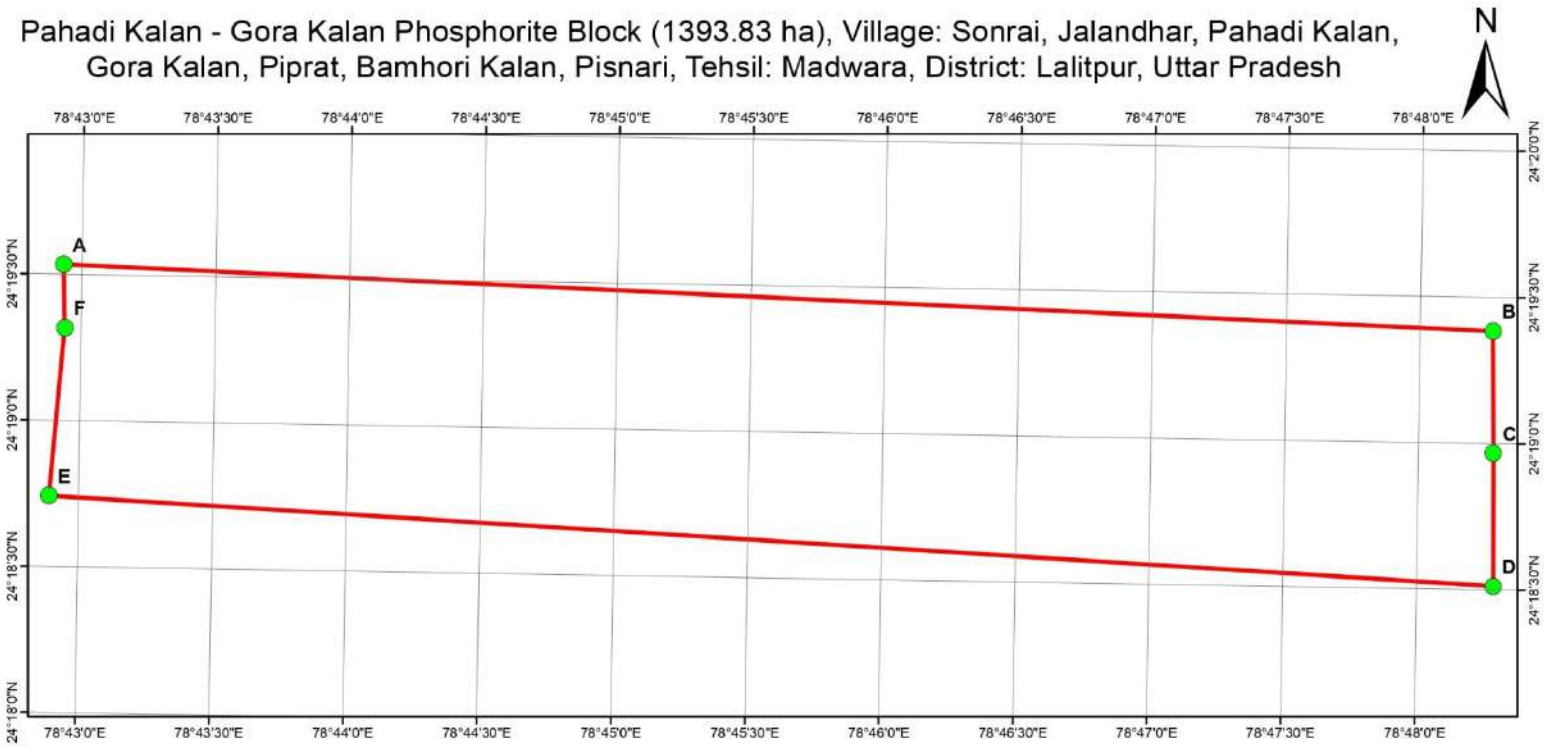
1. Mineral Block Summary has been prepared based on the available data in the Geological Report submitted by the exploration agency.
2. Co-ordinate of the block boundary has been considered from the Geological Report.
3. Block area/ Concession area given in the mineral block summary is the calculated area of co-ordinates as provided in the Annexure-I.

**Annexure-I**

**Co-ordinates of corner points of the block boundary of Pahadi Kalan- Gora Kalan Phosphorite Block, Lalitpur-District, Uttar Pradesh**

| Block Cardinal Points | Geographic (DD°MM'SS.SS") | |
|---|---|---|
| | Latitude | Longitude |
| A | 24° 19' 32.02"N | 78° 42' 55.95"E |
| B | 24° 19' 23.00"N | 78° 48' 16.31"E |
| C | 24° 18' 57.97"N | 78° 48' 16.87"E |
| D | 24° 18' 30.71"N | 78° 48' 17.29"E |
| E | 24° 18' 44.50"N | 78° 42' 53.41"E |
| F | 24° 19' 19.03"N | 78° 42' 56.37"E |

Pahadi Kalan - Gora Kalan Phosphorite Block (1393.83 ha), Village: Sonrai, Jalandhar, Pahadi Kalan, Gora Kalan, Piprat, Bamhori Kalan, Pisnari, Tehsil: Madwara, District: Lalitpur, Uttar Pradesh




| DGPS Coordinates of Corner Points of Pahadi Kalan - Gora Kalan Phosphorite Block, Lalitpur District, Uttar Pradesh | | | |
|---|---|---|---|
| Sl. No. | Points | Latitude | Longitude |
| 1 | A | 24° 19' 32.02"N | 78° 42' 55.95"E |
| 2 | B | 24° 19' 23.00"N | 78° 48' 16.31"E |
| 3 | C | 24° 18' 57.97"N | 78° 48' 16.87"E |
| 4 | D | 24° 18' 30.71"N | 78° 48' 17.29"E |
| 5 | E | 24° 18' 44.50"N | 78° 42' 53.41"E |
| 6 | F | 24° 19' 19.03"N | 78° 42' 56.37"E |

Part of Survey of India Toposheet No. 54L/14 & 54L/15

1:25,000

0 0.35 0.7 1.4 2.1 2.8 Kilometers

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**Summary of the Mineral Block**

**PART A**

**GENERAL INFORMATION ABOUT MINERAL BLOCK**

| | **Features** | **Details** |
|---|---|---|
| 1 | **Location** | |
| | Mineral Block | **Salal-Haimna Lithium, Titanium and Bauxite (Aluminous Laterite) Block** |
| i | Location | Block is bounded by,<br>Latitude:33°10'33.726"N to 33°09'30.407"N<br>Longitude:74°48'23.245"E to 74°49'54.363"E |
| ii | Corner Points (Latitude,Longitude) | Attached as Annexure-1 |
| | Villages | Salal, Gurha, Haimna |
| | Tehsil/ Taluka | Reasi |
| | District | Reasi |
| | State | UT: Jammu and Kashmir |
| 2 | **Area (hectares)** | |
| | Total Area of Block for Auction | 317.638 Ha |
| | Mineralised Area | - |
| | Non-mineralised area | - |
| 3 | **Exploration** | |
| | Status (G2/ G3/ G4 etc.) | G-3 (Preliminary exploration)<br>(Recommended for Composite License) |
| | Exploration Agency | Geological Survey of India, Lucknow |
| | Highlights of Geochemical Survey | It is inferred that the higher values of Al2O3 (%) and Li (> 200ppm) in BRS are mainly associated with rocks of bauxite column (pisolitic bauxite, non-pisolitic bauxite and claystone. Li and Al2O3 (%) scatter plot for the bedrock samples clearly depicts positive correlation among these two elements.<br>The streams samples were collected in a random manner, good values of Al2O3 (%) avg. 22.8% and Li avg. 299ppm were detected in analysed stream sediment samples. These considerably high values of Al2O3 (%) and Li (ppm) indicates the flux of sediments derived from the northerly dipping bauxite column. The high values and positive correlation of Al2O3 (%) and Li (ppm) analysis in BRS and stream sediment samples favors the potentiality of bauxite and it helped in borehole planning over bauxite to explore for third dimension. |
| | Drilling | 37 nos of boreholes with total drilling meterage of 487.55m. Core drilling. |
| | Borehole Density | 200m spacing |
| | Trench and Pit | 67.5 cum (03 nos of pits),<br>Each pit has dimension of 3m ×3m×2.5m. |
| 4 | **Quantity of Minerals (Grade wise)** | |
| | Minerals | **Lithium, Titanium and Bauxite (Aluminous Laterite)** |

| | Features | Details |
|---|---|---|
| | **Geological Resources of Minerals** | |
| | **Inferred Mineral Resources**<br>**Lithium:**5.9 mt with an avg. grade of **583ppm** at cutoff of **≥200ppm** for sub-horizontally dipping (20°) bauxite column, (3439.700 Tonnes Li metal content)<br>**Titanium (TiO2):** 5.1346mt with an avg. grade of 2.3% TiO2 with cut off ≥ 2% TiO2, which is associated with Lithium. (70798.432 Tonnes Ti Metal Content)<br>**Aluminous Laterite:** 13.2mt at an avg. grade 33.9% Al2O3 with cutoff ≥ 20% Al2O3. | |
| 5 | **Mineralised Zones** | |
| | Number of Mineral Zones | - |
| | Trend (Dip and Strike) | Bauxite lithology occurs as E-W to NW-SE trending slab/wedge of layered rocks with horizontal to sub horizontal dip towards the River Chenab in the north. |
| | Justification | As per the data available in the report, it is reported the presence of critical/strategic mineral mineralization in the block area. The block may be recommended for putting for auction of composite license (CL) for up-gradation of level of exploration to assess the full economic potentiality of the critical/strategic mineral mineralization in the block. |
| 6 | **Accessibility** | |
| | Nearest Rail Head | Shri Mata Vaishno Devi Railway Station is the nearest Railway Station situated in Katra. |
| | Road | The area is directly connected by National Highways (NH-44) from Jammu to Domel (30km) and from Domel to Salal (67 km via Katra-Reasi, NH-144) |
| | Airport | The nearest airport is at Satwari, Jammu that is 100 km from the block area. |
| 7 | **Hydrography** | |
| | Local Surface Drainage Pattern | There is no such river within the block area. There exist only seasonal low order streams with contributes to river Chenab. |
| | Rivers etc | |
| 8 | **Climate** | |
| | Mean Annual Rainfall | 1200 mm |
| | Temperature | The lower reaches experience extreme hot weather during May to August. The higher reaches become foggy during rainy and winter season. Avg. Temperature (annual) is 18.5° C. |
| | Temperature (June) | |
| 9 | **Topography** | |
| | Toposheet Number | Survey of India Toposheet No- 43K/16 |
| | Morphology of the area | The hilly topography with hills rising from 487m to 1038m elevation are present. |

**PART B**

**PARTICULARS OF STATUTORY LICENSE, PERMITS, PERMISSIONS, CONCESSIONS, APPROVALS AND CONSENTS RELATED TO MINING OPERATIONS**

| Sl.No. | Particulars | Details/ Status |
|---|---|---|
| 1 | Forest clearance | To be obtained by the preferred bidder |
| 2 | Wild life clearance (sanctuary, reserve or special zone clearances) | To be obtained by the preferred bidder |
| 3 | Environmental clearance | To be obtained by the preferred bidder |
| 4 | Mining plan approval | To be obtained by the preferred bidder |
| 5 | Consent to establish | To be obtained by the preferred bidder |
| 6 | Explosive license | To be obtained by the preferred bidder |
| 7 | Permission for mine opening | To be obtained by the preferred bidder |
| 8 | Permission of installation/ trial operation of equipment | To be obtained by the preferred bidder |
| 9 | Ground water clearance (Centre/State) | To be obtained by the preferred bidder |
| 10 | Railway siding approval | To be obtained by the preferred bidder |
| 11 | Approval for diesel storage | To be obtained by the preferred bidder |
| 12 | Power line from state Discom | To be obtained by the preferred bidder |
| 13 | Clearances relating to work under an existing transmission line or shifting of the transmission line | To be obtained by the preferred bidder |
| 14 | GramaSabha consent | To be obtained by the preferred bidder |
| 15 | Any other clearances to start mining operation | To be obtained by the preferred bidder |

**PART C**

**PARTICULARS OF LAND**

| Sl. No. | Land Type | Area (in Hectares) |
|---|---|---|
| 1 | Total Concession Area | 317.638 Ha |
| 2 | Forest Land with Status | - |
| 3 | Government Land with Status | - |
| 4 | Private Land with Status | - |
| 5 | Revenue survey details of the area | - |

**Note:**

1. Mineral Block Summary has been prepared based on the available data in the Geological Report submitted by the exploration agency.
2. Co-ordinate of the block boundary has been considered after DGPS Survey of the boundary corner points of the block.
3. Block area/ Concession area given in the mineral block summary is the calculated area of co-ordinates as provided in the Annexure-I.

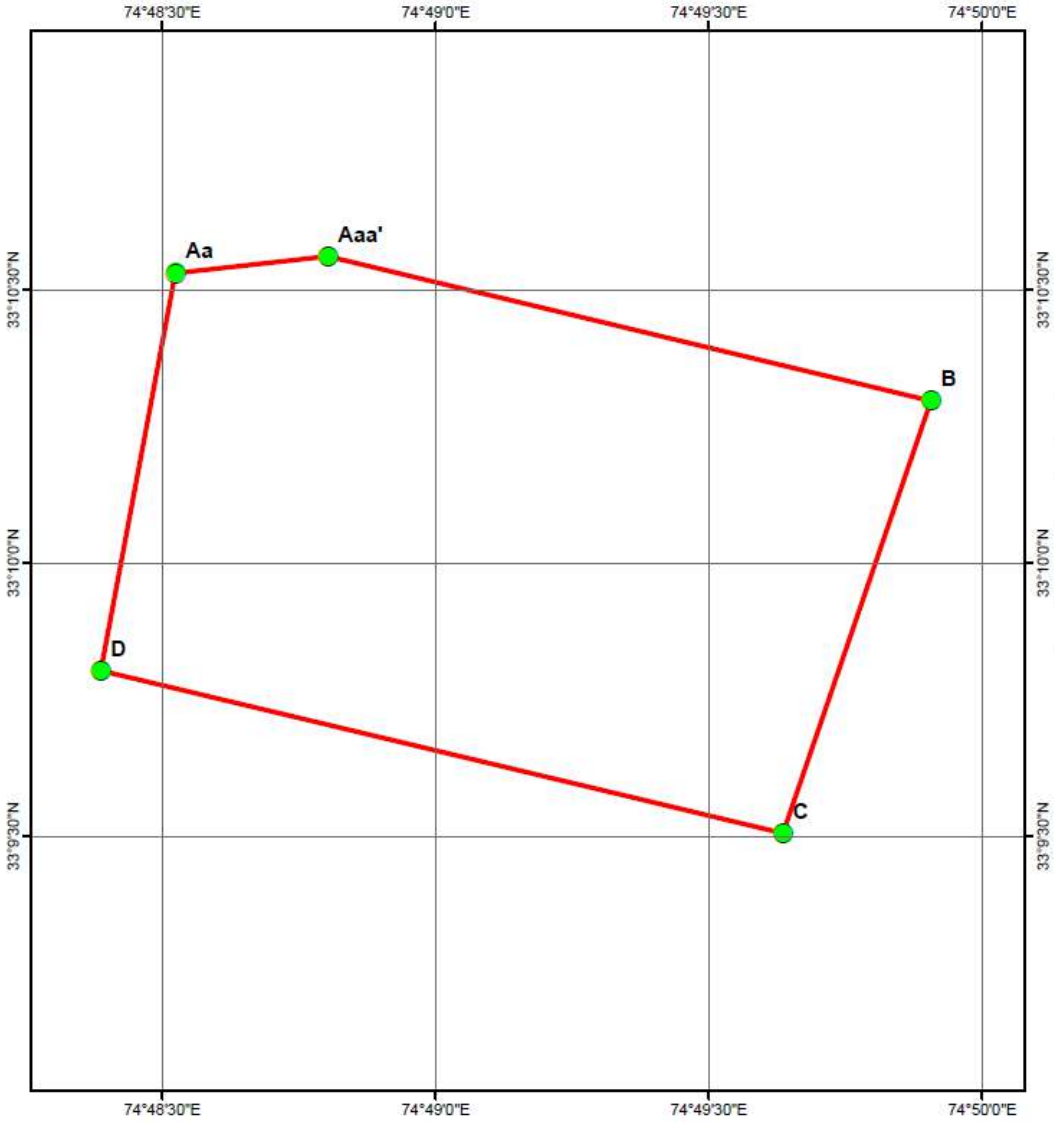
***

Annexure-I

**DGPS Co-ordinates of Block Boundary Corner Points ofSalal-Haimna Lithium, Titanium and Bauxite (Aluminous Laterite) Block**

| POINTS | LATITUDE | LONGITUDE |
|---|---|---|
| Aa | 33°10'31.886"N | 74°48'31.437"E |
| Aaa' | 33°10'33.726"N | 74°48'48.174"E |
| B | 33°10'17.864"N | 74°49'54.363"E |
| C | 33°09'30.407"N | 74°49'38.116"E |
| D | 33°09'48.231"N | 74°48'23.245"E |

## Salal-Haimna Lithium-REE-Titanium and Bauxite Block (317.638 ha), Village: Salal, Gurha, Haimna, Tehsil: Reasi, District: Reasi, Jammu and Kashmir




N

**Coordinates of Corner Points of Salal-Haimna Lithium-REE-Titanium and Bauxite Block, Reasi District, Jammu and Kashmir**

| Sl. No. | Points | Latitude | Longitude |
|---|---|---|---|
| 1 | Aa | 33°10'31.886"N | 74°48'31.437"E |
| 2 | Aaa' | 33°10'33.726"N | 74°48'48.174"E |
| 3 | B | 33°10'17.864"N | 74°49'54.363"E |
| 4 | C | 33°09'30.407"N | 74°49'38.116"E |
| 5 | D | 33°09'48.231"N | 74°48'23.245"E |

Part of Survey of India Toposheet No. 43K/16

1:15,000

0 0.2 0.4 0.8 1.2 1.6 Kilometers

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**Summary of the Mineral Block**

**PART A**

**GENERAL INFORMATION ABOUT MINERAL BLOCK**

| | **Features** | **Details** |
|---|---|---|
| 1 | **Location** | |
| | Mineral Block | **Katghora Lithium and REE Block** |
| i | Location | Block is bounded by,<br>Latitude: 22°30'38" to 22°31'40"<br>Longitude: 82°34'16" to 82°35'03" |
| ii | Corner Points (Latitude,Longitude) | Attached as Annexure-1 |
| | Villages | Katghora-Guchapur |
| | Tehsil/ Taluka | Katghora |
| | District | Korba |
| | State | Chhattisgarh |
| 2 | **Area (hectares)** | |
| | Total Area of Block for Auction | 256.12 Ha |
| | Mineralised Area | - |
| | Non-mineralised area | - |
| 3 | **Exploration** | |
| | Status (G2/ G3/ G4 etc.) | G-4 (Reconnaissance Survey)<br>(Recommended for Composite License) |
| | Exploration Agency | Geological Survey of India, State Unit: Chhattisgarh, Central Region, Raipur |
| | Highlights of Geochemical Mapping | Geochemical mapping brought out anomalous values of lithium ranging from 82.606 to 155 ppm in 7 nos. of composite stream sediment samples in and around Katghora area.<br>Bedrock samples reports shows, the content of Li in the granitoids of the investigated area ranges from 10 to 2000 ppm. Li content in homophanus leucogranite is 25-2000 ppm, in granitic pegmatite is 160-600 ppm and in pegmatite is 10-440 ppm.<br>The Li content in the channel samples ranges from 40 ppm to 1000 ppm. |
| | Highlights of ICPMS studies | Analysis carried out by LA-Q-ICP-MS at NCEGR, Faridabad yielded Li content in pink micas in a range of 1000 ppm to 4000 ppm and in golden brown micas 1000 ppm. Significantly, Li content is substantially higher in cores of pink mica grains compared to their margins.<br>EPMA study confirms the presence of REE phases like apatite, monazite, xenotime and churchite in all the samples of homophanus leucogranite. It confirms the presence of Ta-Nb phase in a sample of homophanus leucogranite.<br>Presence of REE phases such as cebaite [Ba3(Nd,Ce)2(CO3)5F2] and monazite has been identified by XRD analysis of heavy minerals separated from colluvial sediments (in two nos. of samples) |
| | Drilling | Drilling not carried out. |

| | Features | Details |
|---|---|---|
| | Borehole Density | Drilling not carried out. |
| | Trench and Pit | Pit/trench- 20.1 Cum |
| 4 | **Quantity of Minerals (Grade wise)** | |
| | Minerals | Lithium and REE |
| | **Geological Resources of Minerals** | |
| | Resources not estimated. | |
| 5 | **Mineralised Zones** | |
| | Number of Mineral Zones | - |
| | Trend (Dip and Strike) | NW-SE trend with 60-70° dip towards NE |
| | Justification | As per the data available in the report, it is reported the presence of Lithium and REE mineral mineralization in the block area. The block may be recommended for putting for auction of composite license (CL) for up-gradation of level of exploration to assess the full economic potentiality of the Lithium and REE mineral mineralization in the block. |
| 6 | **Accessibility** | |
| | Nearest Rail Head | Korba station |
| | Road | Bilaspur-Katghora-Ambikapur is connected by all-weather metalled road which passes through the block area. Katghora is well connected with the district headquarter Korba by NH 149B. |
| | Airport | Raipur |
| 7 | **Hydrography** | |
| | Local Surface Drainage Pattern | The major river draining the area is Hasdo River flowing from NW to SE almost through the central part with its main tributary Tan nadi in west. The sub-parallel, radial and dendritic drainage patterns. |
| | Rivers etc | |
| 8 | **Climate** | |
| | Mean Annual Rainfall | The total annual ranges from 1200 mm to 1500 mm. |
| | Temperature | Maximum temperature exceeds $45^0$ Celsius in the month of May and minimum temperature falls below $8^0$ Celsius in the month of December. |
| | Temperature (June) | |
| 9 | **Topography** | |
| | Toposheet Number | Survey of India Toposheet No- 64 J/10 |
| | Morphology of the area | The highest and lowest contour elevation in the study area are 914 m and 320 m respectively. |

**PART B**

**PARTICULARS OF STATUTORY LICENSE, PERMITS, PERMISSIONS, CONCESSIONS, APPROVALS AND CONSENTS RELATED TO MINING OPERATIONS**

| Sl.No. | Particulars | Details/ Status |
|---|---|---|
| 1 | Forest clearance | To be obtained by the preferred bidder |
| 2 | Wild life clearance (sanctuary, reserve or special zone clearances) | To be obtained by the preferred bidder |
| 3 | Environmental clearance | To be obtained by the preferred bidder |
| 4 | Mining plan approval | To be obtained by the preferred bidder |
| 5 | Consent to establish | To be obtained by the preferred bidder |
| 6 | Explosive license | To be obtained by the preferred bidder |
| 7 | Permission for mine opening | To be obtained by the preferred bidder |
| 8 | Permission of installation/ trial operation of equipment | To be obtained by the preferred bidder |
| 9 | Ground water clearance (Centre/State) | To be obtained by the preferred bidder |
| 10 | Railway siding approval | To be obtained by the preferred bidder |
| 11 | Approval for diesel storage | To be obtained by the preferred bidder |
| 12 | Power line from state Discom | To be obtained by the preferred bidder |
| 13 | Clearances relating to work under an existing transmission line or shifting of the transmission line | To be obtained by the preferred bidder |
| 14 | Grama Sabha consent | To be obtained by the preferred bidder |
| 15 | Any other clearances to start mining operation | To be obtained by the preferred bidder |

**PART C**

**PARTICULARS OF LAND**

| Sl. No. | Land Type | Area (in Hectares) |
|---|---|---|
| 1 | Total Concession Area | 256.12 Ha |
| 2 | Forest Land with Status | 84.8635 Ha (As per PM Gatishakti Portal) |
| 3 | Government Land with Status | - |
| 4 | Private Land with Status | - |
| 5 | Revenue survey details of the area | - |

**Note:**

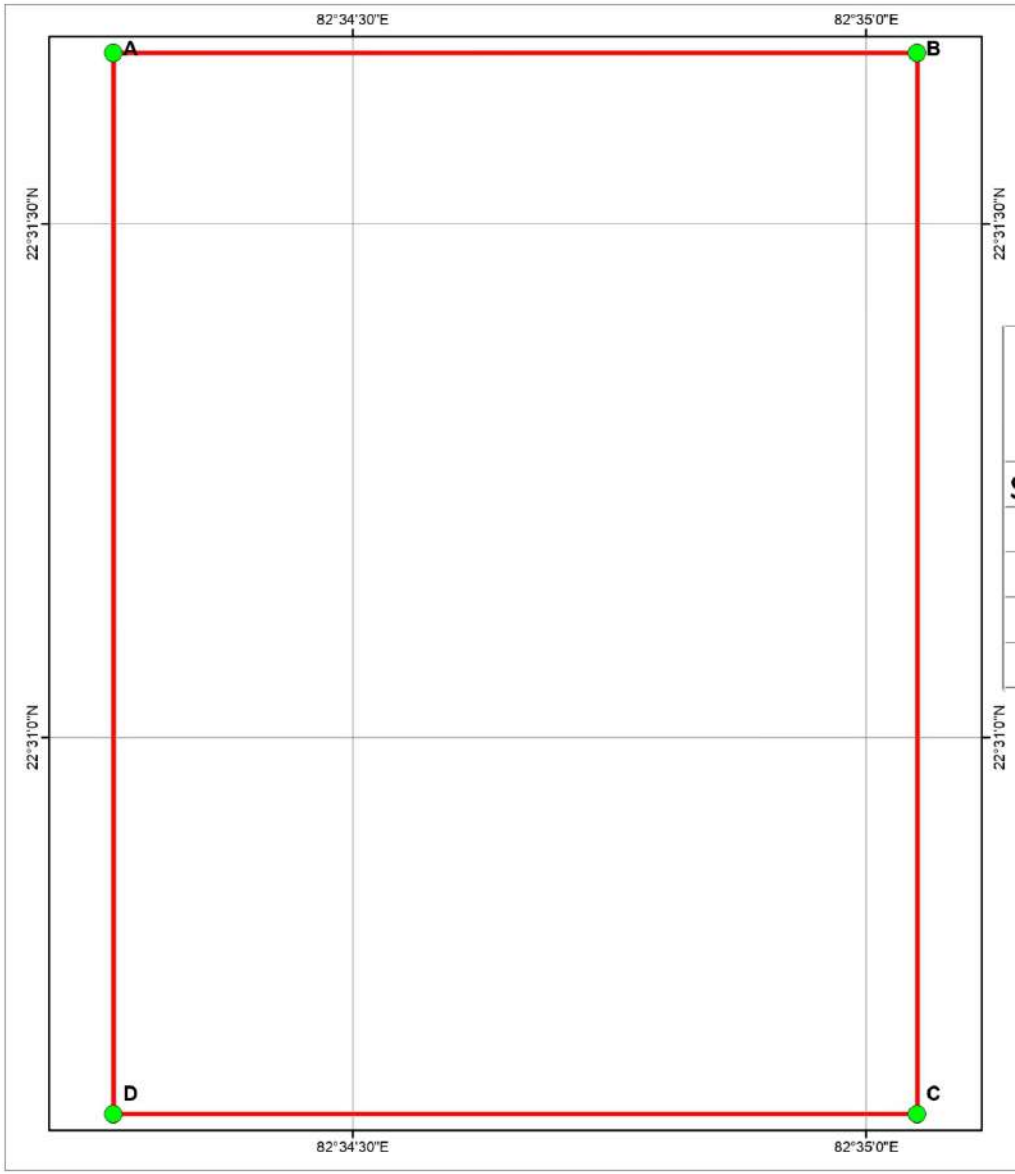
1. Mineral Block Summary has been prepared based on the available data in the Geological Memorandum (CR_CH_15_Katghora_II) and Geological Report submitted by the exploration agency.
2. Co-ordinate of the block boundary has been considered from Geological Memorandum of the block.
3. Block area/ Concession area given in the mineral block summary is the calculated area of co-ordinates as provided in the Annexure-I.

***

Annexure-I

**DGPS Co-ordinates of Block Boundary Corner Points of Katghora Lithium and REE Block**

| POINTS | LATITUDE | LONGITUDE |
|---|---|---|
| A | 22°31’40” | 82°34’16” |
| B | 22°31’40” | 82°35’03” |
| C | 22°30’38” | 82°35’03” |
| D | 22°30’38” | 82°34’16” |




Katghora Lithium and REE Block (256.12 ha), Village: Katghora, Guchapur, Tehsil: Katghora, Korba District, Chhattisgarh

N

**Coordinates of Corner Points of Katghora Lithium and REE Block, Korba District, Chhattisgarh**

| Sl. No. | Points | Latitude | Longitude |
|---|---|---|---|
| 1 | A | 22° 31' 40" N | 82° 34' 16" E |
| 2 | B | 22° 31' 40" N | 82° 35' 3" E |
| 3 | C | 22° 30' 38" N | 82° 35' 3" E |
| 4 | D | 22° 30' 38" N | 82° 34' 16" E |

Part of Survey of India Toposheet No. 64J/10

1:7,500

0 0.1 0.2 0.4 0.6 0.8 Kilometers

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