OMC | ODISHA NEW OPPORTUNITIES

Mining Happiness

Letter No. 18344 /OMC/Expl/2025
Date. 24/11/2025

To

The Director,
National Mineral Exploration and Development Trust Secretariat,
Ministry of Mines,
Room No. 325 & 326, Wing-F,
Udyog Bhawan,
Rafi Ahmed Kidwai Marg,
Rajpath Area, Central Secretariat,
New Delhi-110011

Sub: Proposal for approval of Kenamenta Block in Sundargarh District, Odisha, for Preliminary Exploration (G3-Stage) under NMEDT.

Ref: Notification No. 4326/S&M, Bhubaneswar, dtd. 21.05.2024

Sir,

In inviting a reference to the subject cited above, the Department of Steel & Mines, Government of Odisha, in exercise of the power conferred under the Rule 67 of Mineral Concession Rules 2016, has allotted Kenamenta Block in favour of Odisha Mining Corporation Ltd. for the exploration of Manganese Ore over an area of 0.7009 sq.km (70.09 ha.) in Sundargarh district, Odisha, vide its Notification No. 4326/S&M, Bhubaneswar, dtd. 21.05.2024.

In this regard, the proposal for Preliminary Exploration (G3 Stage) for Iron and Manganese Ore in Kenamenta Block has been prepared as per NMEDT format and enclosed herewith for kind consideration for NMEDT funding.

Encl: As above.

Yours faithfully,

24-11-2025

Chief General Manager
(Geology)

Odisha Mining Corporation Ltd.
(A Gold Category State PSU)
Registered Office : OMC House, Bhubaneswar - 751001, India
Tel : 0674-2377400/2377401, Fax: 0674-2396889, 2391629, www.omcltd.in
CIN : U13100OR1956SGC000313

Memo No. 18345 /OMC/Expl/2025 Date: 24/11/2025

Copy along with the enclosures forwarded to the Deputy Director General (Dy.DG), Geological Survey of India, Bhubaneswar, State Unit - Odisha, for kind information and necessary action.

24-11-2025

Chief General Manager
(Geology)

Memo No. 18346 /OMC/Expl/2025 Date: 24/11/2025

Copy along with the enclosures forwarded to Pr. P.S. to Additional Chief Secretary, Steel & Mines Department, for kind information of Additional Chief Secretary, Steel & Mines Department.

24-11-2025

Chief General Manager
(Geology)

Memo No. 18347 /OMC/Expl/2025 Date: 24/11/2025

Copy along with the enclosures forwarded to the Director, Directorate of Mines and Geology, Govt. of Odisha, Bhubaneswar, for kind information and necessary action.

24-11-2025

Chief General Manager
(Geology)

PROPOSAL FOR

PRELIMINARY EXPLORATION (G-3 STAGE) OF KENAMENTA BLOCK OVER AN AREA OF 0.7009 SQ.KM IN SUNDARGARH DISTRICT, ODISHA UNDER NMEDT.

FERROUS: IRON & MANGANESE

BY

ODISHA MINING CORPORATION LTD.
(A Gold Category State PSU)

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ODISHA MINING CORPORATION LTD.
Mining Happiness

Place: Bhubaneswar
Date: 11. 2025

SUMMARY OF THE KENAMENTA BLOCK FOR G3 STAGE EXPLORATION

SL. No.	Features	Details
	Block ID	Kenamenta Block
	Current Exploration Agency	Odisha Mining Corporation Ltd. (OMC), Bhubaneswar.
	Previous Exploration Agency	Geological Survey of India (GSI) Directorate of Mines & Geology, Odisha
	G4 stage Geological Report (Previous stage Geological Report)	Directorate of Mines & Geology, Odisha **(ANNEXURE I)**
	Commodity	Iron & Manganese
	Mineral Belt	Bonai-Keonjhar Iron Ore Belt
	Completion Period with entire time schedule to complete the project	12 months
	Objectives	To explore the Kenamenta Block up to G3 stage through • Geological mapping in 1:4000 scale • Topographic Survey • Diamond Core drilling • Core Sampling & Laboratory Studies • Geological Report
	Whether the work will be carried out by the proposed agency or through outsourcing and details thereof. Components to be outsourced and name of the outsource agency	• Geological mapping (OMC) • Topographic Survey (Outsourced agency to be selected through tendering) • Diamond Core drilling (Outsourced agency to be selected through tendering) • Laboratory Studies (Outsourced agency to be selected through tendering) • Geological Report (OMC)
	Name/ Number of Geoscientists	Three Geologists (OMC)
	Expected Field days (Geology, Geophysics, Surveyor)	Geologist - Field: 150 days Geologist - HQ: 60 days Surveyor: 30 days

1.	**Location**	
	Latitude	21°55'13.064" - 21°55'58.285"
	Longitude	85°21'9.238" - 85°21'38.253"
	Villages	Kenamenta
	Tehsil/ Taluk	Koira Tahasil
	District	Sundargarh
	State	Odisha
2.	**Area (hectares/ square kilometres)**	
	Block Area	0.7009 Sq. Km or 70.09 Ha.
	Forest Area	13.21 Ha.
	Government Land Area	36.16 Ha.
	Private Land Area	20.72 Ha.
3.	**Accessibility**	
	Nearest Rail Head	Jaroli Railway Station is at a distance of 15 km from the Block
	Road	Koira-Bamberi road is at a distance of 2 km South of the Block
	Airport	Biju Patnaik International Airport, Bhubaneswar is at a distance of 280 km from the Block.
4.	**Hydrography**	
	Local Surface Drainage Pattern (Channels)	Dendritic
	Rivers/Streams	Kakarpani Nala flows near by the block
5.	**Climate**	
	Mean Annual Rainfall	1230 mm
	Temperatures (December) (Minimum) Temperatures (May-June) (Maximum)	8°C (Minimum) to 43°C (Maximum) The region exhibits sub-tropical climate characterized by hot and dry summer, cold winter and erratic rainfall in monsoon. During summer (March to the mid-June), the maximum temperature rises up to 43°C and during winter (November to February), the average temperature drops down to 8°C. May is

		the hottest month and December is the coldest month of the year. The rainy season extends from mid-June to middle of October. The Relative humidity is around 60-70%.
6.	**Topography**	
	Toposheet Number	73G/5 (F45N5) A map showing the Kenamenta Block boundary over the part of Toposheet is presented as **PLATE I**.
	Morphology of the Area	Undulating to planar topography. A satellite image of the Kenamenta Block derived from Google Earth is presented as **PLATE II.**
7	**Availability of baseline geoscience data**	
	Geological Map (1:50K)	A map showing the block boundary of Kenamenta Block over the regional geological map of Bonai-Keonjhar iron ore belt (modified after Jones, Nanda and Beura) is presented as **PLATE III**. Geological map of GSI in 1:50K covering the Kenamenta Block, is presented as **PLATE IV**.
	Geochemical Map	Not Available
	Geophysical Map (Aero geophysical, Ground geophysical, Regional as well as local scale GP maps)	Not Available
8.	**Justification for taking up G3 mineral exploration**	• The Kenamenta Block forms a part of the eastern limb of the Bonai-Keonjhar Belt in Northern Odisha. This region is strategically positioned within an active iron and manganese mining area, with several surrounding mines signifying significant mineral potential.

		• The Directorate of Mines & Geology, Odisha, in its "*Report on Investigation of Manganese Ore around Kenamenta in Sundargarh District, Odisha*" during the Field Season 2012-13, reported the identification of a workable manganese deposit consisting of three bands in and around Kenamenta village. Of these, the Middle and Southern Bands partially fall within the Kenamenta Block allocated to OMC. • In the above study, a total of 0.4348 million tonnes of manganese ore and 0.0126 million tonnes of iron ore were estimated in the inferred category. The manganese percentage, ranging from 15.39%, was considered for resource estimation. • A preliminary field visit was conducted by OMC in the area, revealing that the block exhibits iron and manganese mineralization associated with brecciated cherty quartzites. A total of 09 surface samples were collected and chemically analyzed. Four manganese samples from the northern part of the block showed manganese content ranging from 14% to 54%, while five iron ore samples exhibited iron content ranging from 57% to 69%. Manganese mineralization was also observed in laterites along the hilltops.

		Additionally, canga iron ore was found along the slopes and valleys, while iron ore float deposits were identified within the soil cover of the block. • The proposed exploration program includes detailed geological mapping and the drilling of nineteen boreholes to assess the iron and manganese mineralization potential of the block.

1. Block Summary

1.1. Physiography

The Kenamenta Block features an undulating topography, with elevations ranging from 580 MSL to 600 MSL. The highest elevations are found in the central and southern parts of the block, surrounded by areas of flat terrain. The drainage pattern in this area is generally dendritic. The Kenamenta Block falls on the SOI Toposheet No. F45N5 (73G/5). A map showing the block boundary of Kenamenta Block over part of the SOI Toposheet is presented as **PLATE I**. A satellite image of the Kenamenta Block derived from Google Earth is presented as **PLATE II**.

1.2. Regional Geology

The Kenamenta Block forms the central part of the eastern limb of the Bonai-Keonjhar (BK) belt in Sundargarh and Keonjhar districts of Northern Odisha. The belt is disposed in the form of northerly low-plunging synclinorium in the form of a Horse-Shoe comprising of volcano-sedimentary rocks trending in NNE direction.

The iron and manganese mineralization in the region is confined within the Iron Ore Group found associated with BHJ/BHQ. The manganese ore bodies in the Bonai- Keonjhar belt belong to Precambrian Iron Ore Group of Meso-archean age and are found to be associated with volcano-sedimentary rocks and iron ore (Mishra et al., 2016). Manganese ore bodies of this region has been categorized into stratiform, stratabound-replacement and lateritoid types by Mishra et al., 2016. The various types of the iron ore found in this region include hard massive ore, laminated ore, powdery ore/blue dust, shaly ore and lateritic ore. A map showing the block boundary of Kenamenta Block over the regional geological map of Bonai- Keonjhar iron ore belt (modified after Jones, Nanda and Beura) is presented as **PLATE III**. The generalized stratigraphy succession of Bonai- Keonjhar is as follows:

Sub-recent	Soil & Alluvium
	Laterite
	Newer Dolerite
Kolhan Group	Quartzite
.....Unconformity.....	
	Singhbhum Granite
	Epidiorite (Intrusive)
Iron Ore Group	Upper tuffs and Volcanics
	Manganese bearing shale
	BIF (BHQ/BHJ) with iron ores
	Lower tuffs, volcanics and tuffaceous shale
	Sandstone and Conglomerate
.....Unconformity.....	
Older Metamorphic Group	Pellitic schist, quartzite, amphibolite

Geological map of GSI in 1:50K covering the Kenamenta Block, is presented as **PLATE IV**.

1.3. Geology of the Block

The Kenamenta Block is primarily covered by soil and cherty quartzites with less laterite. The iron and manganese mineralization in the block is found associated with the quartzites. OMC has carried out a preliminary survey in the Kenamenta Block and prepared a field interpreted geology map and is presented as **PLATE V**.

The stratigraphy succession of the block as evident from previous studies and from the preliminary field traverses are as follows:

Top	Soil	
	Laterite	
	Cherty Quartzite	(*Fe & Mn mineralization*)
Bottom	Shale	

Soil The soil is generally of lateritic type, with reddish brown colour overlain by laterite. The thickness of the soil is about 0.5 metre.

Laterite: The top of the hillocks is exposed with lateritic durcirusts. These laterites are often associated with ferrous or manganese mineralization. Additionally, the slopes and valleys are marked by canga ore.

Cherty quartzite: The cherty quartzite (as reported in the G4 stage exploration report by the DoMG, Govt. of Odisha) in the block is typically found in hillocks, surrounded by soil cover. The rock is highly brecciated and exhibits a pink to reddish colour, with a fine to medium grained texture. These are hard, compact and resistant to weathering, contributing to the prominence of the hillock formations in the area. Cherty quartzites in this region are associated with iron or manganese bearing zones and serve as important geological markers for mineralized areas. The quartzite to the north of Kenamenta village is associated with high grade of manganese. The eastern part of the village, as well as the southern part of the block area, is exposed with quartzites associated with iron ore mineralization.

Shale: The shale in the block is very poorly exposed due to extensive soil and lateritic cover. Wherever observed in abandoned pits, these shales occur underlying the cherty quartzites.

1.4. Mineral Potential of the Block

The block area exhibits iron and manganese mineralization found associated with brecciated cherty quartzites. Four manganese samples collected from the Northern part of the block during preliminary visit shows manganese content ranging from 14% to 54% and five iron ore samples have shown iron content ranging from 57% to 69%. Manganese mineralization has been found associated with laterites also along the hill tops. At the slopes and valleys, canga ore has been located. Floats of iron ore has been identified on the soil cover of the block.

1.5. Scope for proposed exploration

The scope of the proposed project is the preliminary exploration (G-3 stage) of Kenamenta Block over an area of 0.7009 Sq. Km in Sundargarh District, Odisha under NMEDT through the following activities:

a) Geological Mapping: To conduct detailed geological mapping at a 1:4000 scale to identify lithological units, structural features, and delineate iron and manganese ore mineralized zones.

b) Topographic Survey: To conduct topographic survey using Total Station or DGPS to generate contour maps and topographic profiles.

c) Diamond Core Drilling: To carry out drilling of nineteen diamond core boreholes to investigate subsurface continuity, thickness, and grade variations of iron and manganese mineralization.

d) Laboratory Analysis: To conduct chemical and physical studies of collected surface and drill core samples to determine mineral grades, mineralogical composition, and other relevant characteristics.

e) Geological Report: To prepare a comprehensive Geological Report in accordance with the provision of Rule 72 of Mineral Conservation and Development Rules, 2017.

1.6. Recommendations of G4 Stage Mineral Exploration Report.

In the G4 stage exploration report by the Department of Mines and Geology, Government of Odisha, it was concluded that the small pocket type manganese deposits in the region, in the form of manganese bands, may be assemble to form a workable deposit. An inferred resource of 0.43 lakh tonnes of manganese and 0.0126 million tonnes of iron ore was estimated in the study. The report also recommended further detailed exploration by adding more closely spaced boreholes.

1.7. Objectives

The objective of the proposed exploration for the Kenamenta Block is to conduct Preliminary Exploration (G3) in compliance with the as per Minerals (Evidence of Mineral contents) Amendment Rules-2021 and Mineral (Auction) Second Amendment Rules-2021. The exploration aims to identify and delineate iron and manganese mineralized zones through detailed geological mapping at a 1:4000 scale, topographic surveying, diamond core drilling of nineteen boreholes, and comprehensive laboratory analysis of the samples. The

exploration will focus on estimating both the quantity and quality of the ore body, progressing to G2 level exploration to prepare the block for auction.

2. Previous Work

Between 1919 and 1927, H.C. Jones and M.S. Krishnan (Jones 1934) has carried out traverses along various deposits in entire Singhbhum (Bihar), Keonjhar and Sundargarh districts (Odisha) and estimated a reserve of about 2970 million tonnes of iron ore with iron content of 60 per cent. Several other investigations were also carried out by Directorate of Mining & Geology, Government of Odisha around Mithirda, Baliapahar and Basada-Kriyakudar.

During 2008-09, P.K Panigrahi *et al.* of Directorate of Mining & Geology, Government of Odisha, carried out the iron and manganese ore assessment around Malngtoli - Mandajorha featured in Toposheet No. 73G/5. During the study, a geological mapping of 1:25,000 was conducted covering an area of 53 Sq. Km, and identified various rock types including BIF (BHQ/BHJ), upper shale, laterite, and iron ore. The study identified upper shale and mixed facies formations belonging to Koira Group of IOG containing manganese occurrences in north east and south of Kenamenta village. The occurrence at NE Kenamenta was reported to have a length of 250m and width of about 50m with thickness of 5m associated with chert and laterite. The manganese occurrence at the south of Kenamenta was of 200m length having 100m width and thickness of 5m. Of the 50 grab samples collected, 17 samples containing more than 57% iron and 9 samples with 20.5% were identified. A possible resource of 17.47 MT of iron ore and 0.36 MT of manganese ore have been estimated. The study recommended further exploration by drilling in more phased manner to augment the mineral resources.

In 2012-13, NN Singh Deo *et al.* of the Directorate of Mining & Geology, Government of Odisha, conducted a manganese ore exploration program in and around Kenamenta village, covering an area of 1.05 sq. km. The study area is partially covering the southern part of the Kenamenta Block allotted to OMC for exploration. The geological mapping at a 1:2000 scale identified several lithological units, including cherty quartzite, shale, and laterite, with

manganese ore occurring as isolated bands alongside brecciated chert. Three manganese-bearing bands - Northern, Middle, and Southern were delineated during the study. Two pits were excavated in the soil to study the continuity of Northern Band. Of these, one pit exposed manganese ore at a depth of 1.2m, while the other went barren up to a depth of 3m. Drilling in the largest band i.e. the Southern Band involved two boreholes totalling 59.48 meters, and analysis of 31 core samples revealed manganese grades ranging from 15.39% to 58.96%. Based on surface area methods, an inferred resource of 43,480 tonnes was estimated. The exploration was categorized as G-4 of MEMC Rules - 2015 and recommended further work with more numbers of boreholes to upgrade the status of exploration.

2.1. Preliminary works by OMC

During 2024, OMC has carried out a preliminary survey to assess the mineral potential of the Kenamenta block. During the visit, the team identified significant iron and manganese mineralization, primarily associated with brecciated cherty quartzites.

To gain a better understanding of the mineral content, a total of nine surface samples were collected and chemically analyzed at NABL certified Inspectorate Griffith India Pvt. Ltd., Bhubaneswar Laboratory. Four of the samples from the northern part of the block exhibited manganese content ranging from 14% to 54%, while five iron ore samples revealed iron concentrations between 57% and 69%. In addition to the quartzite deposits, manganese mineralization was also found to be associated with laterites along the hilltops, further indicating the area's rich mineralization. At the slopes and valleys, canga ore deposits were located, and floats of iron ore were observed on the soil cover, pointing to the presence of extensive iron ore reserves in the region. These findings highlight the block's significant potential for both iron and manganese mineral extraction, providing a strong foundation for further exploration and development activities in the area.

Sl. No.	Sample ID	Latitude	Longitude	Fe %	Mn %	SiO2 %	Al2O3 %	LOI %
1	KNM-SS-02	21°55'47.09"	85°21'34.13"	38.00	16.448	6.82	5.64	8.81
2	KNM-SS-03	21°55'41.49"	85°21'33.70"	64.03	0.546	3.42	2.48	2.21
3	KNM-SS-05	21°55'33.93"	85°21'32.19"	65.00	0.535	3.14	2.12	1.78
4	KNM-SS-09	21°55'55.28"	85°21'23.96"	10.35	54.344	1.37	1.21	12.45
5	KNM-SS-10	21°55'54.59"	85°21'30.24"	14.39	14.437		0.53	5.74
6	KNM-SS-12	21°55'56.41"	85°21'23.36"	10.01	52.278	0.40	3.43	13.07
7	KNM-SS-15	21°55'15.95"	85°21'35.15"	57.43	0.570	1.59	0.79	11.80
8	KNM-SS-16	21°55'16.08"	85°21'32.56"	69.03	0.475	1.57	1.10	1.00
9	KNM-SS-18	21°55'16.76"	85°21'19.11"	59.57	1.932	2.74	2.28	7.74

3. Block description

The Kenamenta Block is located in Koira Tahasil of Sundargarh District in Odisha. The block lies in between latitudes 21°55'13.064" to 21°55'58.285" and longitudes 85°21'9.238" to 85°21'38.253" and falls in the Toposheet No. 73G/5 (F45N5).

The location coordinates of the block corner points are tabulated below.

Block corner points	Longitude	Latitude	Easting	Northing
1	85°21'9.238"	21°55'13.129"	329838.6154	2424920.255
2	85°21'10.871"	21°55'20.218"	329887.8181	2425137.775
3	85°21'19.516"	21°55'26.922"	330138.1109	2425341.295
4	85°21'21.469"	21°55'33.404"	330196.2911	2425540.048
5	85°21'23.152"	21°55'38.985"	330246.4255	2425711.175
6	85°21'22.48"	21°55'45.957"	330229.44	2425925.805
7	85°21'22.049"	21°55'50.44"	330218.5501	2426063.813
8	85°21'21.498"	21°55'58.285"	330205.3257	2426305.255
9	85°21'29.918"	21°55'57.724"	330446.7487	2426285.413
10	85°21'37.022"	21°55'51.343"	330648.4961	2426086.985
11	85°21'37.47"	21°55'46.567"	330659.7811	2425939.962
12	85°21'37.054"	21°55'38.439"	330645.1716	2425690.113
13	85°21'37.597"	21°55'32.068"	330658.659	2425494.006
14	85°21'38.253"	21°55'24.363"	330674.9512	2425256.838
15	85°21'36.907"	21°55'18.728"	330634.4736	2425083.947

16	85°21'35.553"	21°55'13.064"	330593.7562	2424910.166
17	85°21'28.415"	21°55'13.082"	330388.923	2424912.91
18	85°21'17.204"	21°55'13.11"	330067.2099	2424917.218

4. Planned Methodology

The proposed methodology to carry out Preliminary Exploration (G3) in the Kenamenta Block will involve geological mapping, topographic surveying, diamond core drilling, laboratory studies and further resource estimation in accordance with Minerals (Evidence of Mineral contents) Amendment Rules-2021 and Mineral (Auction) Second Amendment Rules-2021. The details of the various activities to be undertaken during this exploration program are outlined in the subsequent sections.

4.1. Geological Mapping

Geological mapping will be conducted at a 1:4000 scale over 0.7009 sq.km of the Kenamenta Block to delineate contact of surface lithological types, identify structural features and outline manganese and iron ore-bearing zones. GPS will be used for mapping, and representative surface samples will be collected for further geochemical analysis. By incorporating all the attributes collected from the field and location details, a final map shall be prepared on GIS platform along with all the map elements.

4.2. Topographic Survey

The topographical survey will be carried out over the Kenamenta Block at a 1:4000 scale. The survey will utilize total station or DGPS to locate block boundary corner points and borehole location details in UTM, WGS-84 Datum.

4.3. Drilling, Logging & Sampling

The proposed exploration programme will involve diamond core drilling of nineteen vertical boreholes, totalling 1710 met metres res, to assess the extent, grade, and continuity of the iron and manganese ore bodies within the block. All proposed boreholes will initially be drilled with HQ core size, and NQ will be adopted subsequently in deeper zones or where the formations becomes harder. The borehole locations have been planned based on the preliminary

field visit, with an average depth of 90 metres per borehole. The drill cores will be systematically logged and record details such as core recovery, lithological units, colour, structural features, texture, mineralisation, and ore type. The sampling interval will be carefully assessed during logging. In mineralised zones, the core samples will be collected at one-metre intervals, except where lithological variations occur along the borehole length. The immediate hanging wall and footwall of the ore zone (up to five metres) will also be sampled at one-metre intervals. For sampling purposes, each drill core will be vertically split into two equal halves. One half will be retained in the core box for future reference, while the other half will be crushed and pulverised to pass through a -200 mesh (75-micron) sieve. After coning and quartering, the sample will be divided and packed into four 50g packets. One packet will be sent to an NABL-accredited laboratory for chemical analysis. The second will be preserved in the camp as a duplicate sample, while the third will be utilised for preparing composite samples for individual ore bands. The fourth will be kept either as a check sample or for any other specific future use. The map showing the proposed borehole locations in Kenamenta Block is presented as **PLATE VI**.

4.4. Laboratory Studies

The samples generated shall be sent to different laboratories for various chemical analysis and physical studies. 20 surface samples during geological mapping and 1,368 nos. of primary core samples are estimated from 19 nos. of bore holes and the samples will be chemically analyzed for Fe%, Mn%, SiO2%, Al2O3%, P%, S%, Insolubles & LOI. 10% of primary drill core samples i.e. 137 samples shall be considered as check samples. Further, 38 nos. of samples for composite samples are estimated from ore zones of primary drill core samples.

Five samples for preparation of thin section and ten samples for polished section are planned for petrological and minerographic studies respectively. For XRD studies, ten samples are considered. A limited set of ten drill core samples from all the boreholes is proposed for multi-element (34 elements) analysis as well as REE analysis by ICP-MS to obtain a comprehensive geochemical signature of the mineral deposit. This analysis will help identify

gangue elements influencing beneficiation, detect pathfinder and trace metals of economic significance, and establish geochemical correlations between lithological units. The data will provide valuable baseline information to guide further exploration and metallurgical studies. Bulk density shall be determined for fifteen numbers of samples.

5. Nature Quantum and Target

The quantum of work for the proposed G3 stage exploration of Kenamenta iron ore block is tabulated below:

Sl. No.	Item of Work	Unit	Quantum of Work	Remarks
1	**Tender related works & Outsourcing**		One time	
2	**Detailed Geological mapping**			
a.	Geological mapping at 1:4,000 scale	Sq. Km	0.7009	
3	**Survey**			
a.	Topographic survey and surface contouring	Sq. Km	0.7009	
b.	Demarcation of lease boundary, Fixation of Borehole and determination of co-ordinates & Reduced Level (RL) of the boreholes by DGPS	Per Point of observation	37	
4	**Core Drilling**			
a.	Drilling up to 300m (Hard Rock)	m	1710	19 boreholes; 90m/bh
5	**Laboratory Studies**			
A	Chemical Analysis			
i)	BH Core samples			
a.	Primary samples for Fe%, Mn%, SiO2%, Al2O3%, P%, S%, Insolubles & LOI	Nos	1388	80%drilling + 20 surface samples
b.	Composite samples for seven radicals (Fe%, Mn%, SiO2%, Al2O3%, P%, S%, Insolubles & LOI)	Nos	38	
c.	Analysis of drill core samples for determination of a package by 34 elements by ICP-MS	Nos	10	
d.	Analysis of drill core samples for quantitative REE analysis (14 REE elements/elements) by ICP-MS	Nos	10	
ii)	BH Core samples (10%External)			
a.	Check samples for Fe%, SiO2%, Al2O3%, P%, S%, Mn%, Insolubles & LOI	Nos	137	
B	Physical & Petrological Studies			
i	Preparation of thin section	Nos	5	
ii	Study of thin section	Nos	5	
iii	Digital Photograph of thin section	Nos	5	
iv	Preparation of polish section	Nos	10	
v	Study of polished section	Nos	10	
vi	Digital Photograph of polished section	Nos	10	
vii	XRD analysis for identification of minerals	Nos	10	
viii	Determination of insitu Bulk Density	Nos	15	
6	**Geological Report Preparation**	Nos	1	

6. Manpower deployment

Manpower deployment list may be provided later.

7. Break-up of expenditure

The G3 stage mineral exploration proposal for the Kenamenta Block includes geological mapping, topographic survey, core drilling, laboratory analysis, and report preparation. The estimated cost for this project is Rs. 413.364 lakhs, based on the Schedule of Charges (SoC) for NMEDT-funded projects (effective from 01.04.2020). The entire project is expected to be completed within a twelve-month period. A summary of the estimated costs for each activity, along with detailed cost breakdowns and the projected timeline, is provided in Table 1, Table 2, and Table 3, respectively.

Table 1: Summary of the estimated cost for each activity

Sl. No.	Activity	Amount (Rs.)
1	Geological works	33,27,720.00
2	Survey works	10,40,280.00
3	Drilling	2,15,68,230.00
4	Laboratory Studies	69,14,901.00
5	Peer review Charges	30,000.00
6	Additional cost related to Forest Clearance	1,64,220.00
7	Operational Cost	15,000,00.00
8	Tender Process Cost	5,00,000.00
9	Preparation of Exploration Proposal	5,00,000.00
10	Preparation of Geological Report	9,85,533.93
	Total Estimated Cost without GST	**3,50,30,884.93**
	Total Estimated Cost with GST	**4,13,36,444.22**
	Total in Lakhs	**413.364**

Table 2: Detailed cost estimate for Preliminary Exploration (G-3 stage) for Iron & Manganese Ore in Kenamenta Block, Sundargarh District, Odisha [Area: 0.7009 sq. km; No. of BH: 19 nos.; Borehole depth range- 90m; Schedule timeline- 12 months]

S. No.	Item of Work *	Unit	Rates as per NMET SoC 2020-21		Estimated Cost of the Proposal		Remarks
			SoC-Item No.	Rates as per SoC (a)	Qty. (b)	Total Amount (Rs) (a x b)	
A	**Geological Mapping & Other Geological Works**						
1	Detailed Geological mapping at 1:4,000 scale						
a	Charges for one Geologist per day in field (without labour)	day	1.3	11,000	150	16,50,000.00	
b	Charges for one Geologist per day at HQ	day	1.3	9,000	60	5,40,000.00	
c	Semi-skilled workers for mapping and other geological activities (2 Nos. per party)	day	5.7	674	300	2,02,200.00	Reimbursement will be claimed as per rates precribed by Central Labour Commission rates or respective State Govt. whichever is higher.
d	Charges for one Sampler per day (without labour) (one party)	one sampler per day	1.5.2	5,100	120	6,12,000.00	
e	Semi-skilled workers for sampling (4 Nos. per party)	day	5.7	674	480	3,23,520.00	Reimbursement will be claimed as per rates precribed by Central Labour Commission rates or respective State Govt. whichever is higher.
	Sub Total - A					**33,27,720.00**	
B	**Survey work**						

1	Demarcation of lease boundary, Fixation of Borehole and determination of co-ordinates & Reduced Level (RL) of the boreholes by DGPS	Per Point of observation	1.6.2	19,200	37	7,10,400.00	
a	Charges of one Surveyor per day (without labour) (one party)	one surveyor per day	1.6.1a	8,300	30	2,49,000.00	
b	Semi-skilled workers for survey (4 Nos per party)	day	5.7	674	120	80,880.00	Reimbursement will be claimed as per rates precribed by Central Labour Commission rates or respective State Govt. whichever is higher.
	Sub-Total -B					**10,40,280.00**	
C	**Drilling**						
1	Drilling in Hard Rock	per m	2.2.1.4a	11,500	1,710	1,96,65,000.00	Total 19 boreholes; Avg. 90 m/borehole
2	Drill Core Preservation	per m	5.3	1,590	1,197	19,03,230.00	
	Sub Total - C					**2,15,68,230.00**	
D	**Laboratory Studies**						
1	**Chemical Analysis**						
i)	**BH Core samples (Primary + Composite samples)**						
	a. Primary samples for Fe%, Mn%, SiO2%, Al2O3%, P%, S%, Insolubles & LOI	Nos	4.1.15a	4,200	1,388	58,29,600.00	20 nos. of Surface samples + 80% primary samples (i.e, 1,368 nos.) of total drilling
	b. Compsoite samples analysis for Fe%, Mn%, SiO2%, Al2O3%, P%, S%, Insolubles, Na2O%, K2O% & LOI	Nos	4.1.15a&4.1.15b	5,042	38	1,91,596.00	
	c. Analysis of drill core samples for determination of a package by 34 elements by ICP-MS	Nos	4.1.14	7,731	10	77,310.00	

	d. Analysis of drill core samples for quantitative REE analysis (14 REE elements/elements) by ICP-MS		4.1.13	5,380	10	53,800.00	
ii)	**BH Core check samples (10%External)**						
	a. Check samples for Fe%, SiO2%, Al2O3%, P%, S%, Mn%, Insolubles & LOI	Nos	4.1.15a	4,200	137	5,74,560.00	10% of primary samples
2	**Physical & Petrological Studies**						
i	Preparation of thin section	Nos	4.3.1	2,353	5	11,765.00	
ii	Study of thin section	Nos	4.3.4	4,232	5	21,160.00	
iii	Digital photomicrograph of thin section	Nos	4.3.7	280	5	1,400.00	
iii	Preparation of polish section	Nos	4.3.2	1,549	10	15,490.00	
iv	Study of polished section	Nos	4.3.4	4,232	10	42,320.00	
v	Digital photomicrograph of polished section	Nos	4.3.7	280	10	2,800.00	
vi	XRD analysis for identification of minerals	Nos	4.5.1	4,000	10	40,000.00	
vii	Determination of insitu Bulk Density	Nos	4.10	3,540	15	53,100.00	
	Sub Total - D					**69,14,901.00**	
E	**Total A to D**					**3,28,51,131.00**	
F	**Operational cost**		6.0 (iii)	In case of total outsourced cost more than Rs.1 crore		**15,000,00.00**	The operational charges shall be calculated on the cost of total outsourced component or certified actual payment made by OMC, whichever is lower.
G	**Tendering process cost**	One time	2.3	One time for outsourced component(s) of project work		**5,00,000.00**	Reimbursement will be claimed as per 2% of the approved project cost or 5 lakh whichever is lower

H	**Preparation of Exploration Proposal**	**5 Hard copies with a soft copy**	5.1	2% of the approved project cost or Rs. 5 Lakhs whichever is lower		**5,00,000.00**	Reimbursement will be claimed after submission of the Hard Copies and the soft copy of the final proposal along with Maps and Plan as suggested by the TCC-NMEDT in its meeting while clearing the proposal.
I	**Additional cost**						
i	Additional Expenses for obtaining Forest Clearance (Procurement of Village Sheets, Pillars for PBH and Boundary Corner Points, Preparation of Cadastral Map, Land Details, Authentication of Maps & Land schedules, Preparation of FC Proposal, etc.)		As per Clause 2.VI of the SoC			**1,64,220.00**	
J	**Geological Report Preparation:** including charges for typing of text, table etc.; digitization of maps/sections etc. on GIS in form of shape files; reprographic charges for photocopying of text, maps, plates, binding of reports etc.	**5 Hard copies with a soft copy**	5.2 (iii)	**Project exceeding ₹300 lakh:** Minimum of ₹9 Lakh or 3% of the work which ever is more subject to maximum of ₹20 Lakh and ₹10,000/ each additional copy.	1.00	**9,85,533.93**	Reimbursement will be claimed after submission of the final Geological Report in Hard Copies (5 Nos) and the soft copy to NMEDT.
K	**Peer review Charges**		As per EC decision			**30,000.00**	
L	**Total Estimated Cost without GST (E to K)**					**3,50,30,884.93**	
M	**Provision for GST (18% of L)**					**63,05,559.29**	GST will be reimburse as per actual and as per notified prescribed rate
N	**Total Estimated Cost with GST**					**4,13,36,444.22**	
			or Say Rs. In Lakhs			**413.364**	

Table 3: Estimated Time schedule

Time schedule for Preliminary Exploration (G-3 stage) for Iron & Manganese Ore in Kenamenta Block of OMC

Sl. No.	Activities	UoM	Qty.	1	2	3	4	5	6	7	8	9	10	11	12
1	Geological Mapping	Sq.km	0.7009												
2	Topographic Survey	Sq.km	0.7009												
3	Surface Drilling	m	1710												
4	Sampling & Chemical Analysis	Nos.	1583												
5	Physical Studies	Nos.	70												
6	Report Writing with Peer Review	months	3												

8. References

Mishra, P., Mishra, S.K., Singh, P.P., & Mohapatra, B.K. (2016). Reworked manganese ore bodies in Bonai-Keonjhar belt, Singhbhum Craton, India: Petrology and genetic study. Ore Geology Reviews, 78, 361–370.

Nanda SK, Beura D. Implicating the Origin and Depositional Environment of Banded Iron Formation (BIF) of Bonai-Keonjhar Iron Ore Belt in Eastern
India from its Petrography and Geochemistry. Geology of Ore Deposits. 2021; 63 (6):497–514.

Jones, H.C.-1934: The iron ore deposit of Bihar, Orissa, GSI, mem, vol-63, p-357 Murthy,V.N and Acharya, S -1975: Lithostratigraphy of the Precambrian rocks around Koira, Sundargarh and Kendujhar districts, Orissa.

P.K Panigrahi & R.K Mahanta (2009): Report on Assessment of Iron Ore Occurrence around Malangtoli- Mandajorha Area, Sundargarh District Krishnan M.S. (1982) Geology of India and Burma, CBS Publishers

C. Moharana & S Mohanty (2001): Interim Progress Report On Prospecting For Low Level Iron Ore Deposits Within the I.O.G. Of Sundargarh and Kendujhar Districts, Orissa (p-ii).

NN Singh Deo & R.K Mahanta (2013): Report on Investigation of Manganese Ore around Kenamenta in Sundargarh District, Odisha.

PLATE I

PLAN SHOWING KENAMENTA BLOCK (AREA 0.7009 SQ.KM) IN SUNDARGARH DISTRICT, ODISHA OVER PART OF SOI TOPOSHEET NO. F45N5 (73G/5)

Kenamenta Block with Corner Point (Area 0.7009 Sq.Km)

Block Corner Point	Longitude	Latitude	Block Corner Point	Longitude	Latitude
1	85°21'9.238"	21°55'13.129"	10	85°21'37.022"	21°55'51.343"
2	85°21'10.871"	21°55'20.218"	11	85°21'37.47"	21°55'46.567"
3	85°21'19.516"	21°55'26.922"	12	85°21'37.054"	21°55'38.439"
4	85°21'21.469"	21°55'33.404"	13	85°21'37.597"	21°55'32.068"
5	85°21'23.152"	21°55'38.985"	14	85°21'38.253"	21°55'24.363"
6	85°21'22.48"	21°55'45.957"	15	85°21'36.907"	21°55'18.728"
7	85°21'22.049"	21°55'50.44"	16	85°21'35.553"	21°55'13.064"
8	85°21'21.498"	21°55'58.285"	17	85°21'28.415"	21°55'13.082"
9	85°21'29.918"	21°55'57.724"	18	85°21'17.204"	21°55'13.11"

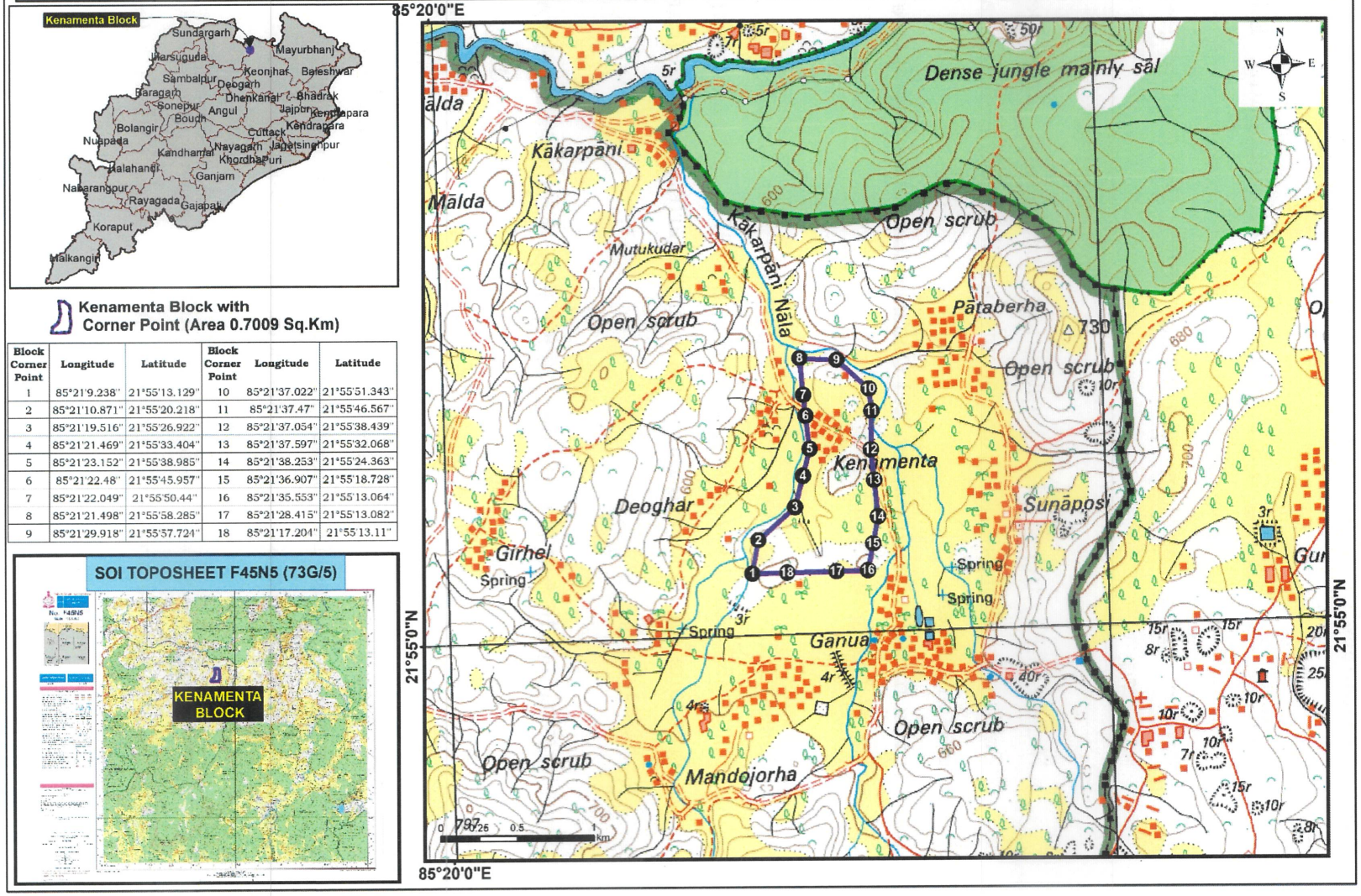


PLATE II


Google Earth Imagery Showing the Kenamenta Block Boundary (Area 0.7009 Sq.Km)
N
MG MOHANTY PATABEDA IRON MINE
MG MOHANTY PATABEDA IRON & MN MINE
TISCO-KHANDBANDH IRON MINE
PAWAN KUMAR AHLUWALIA IRON & MN GANUA
1 km
Legend
Kenamenta Block Boundry
Kenamenta Block Boundry Pillar Point
Mine Location
Google Earth

PLATE III

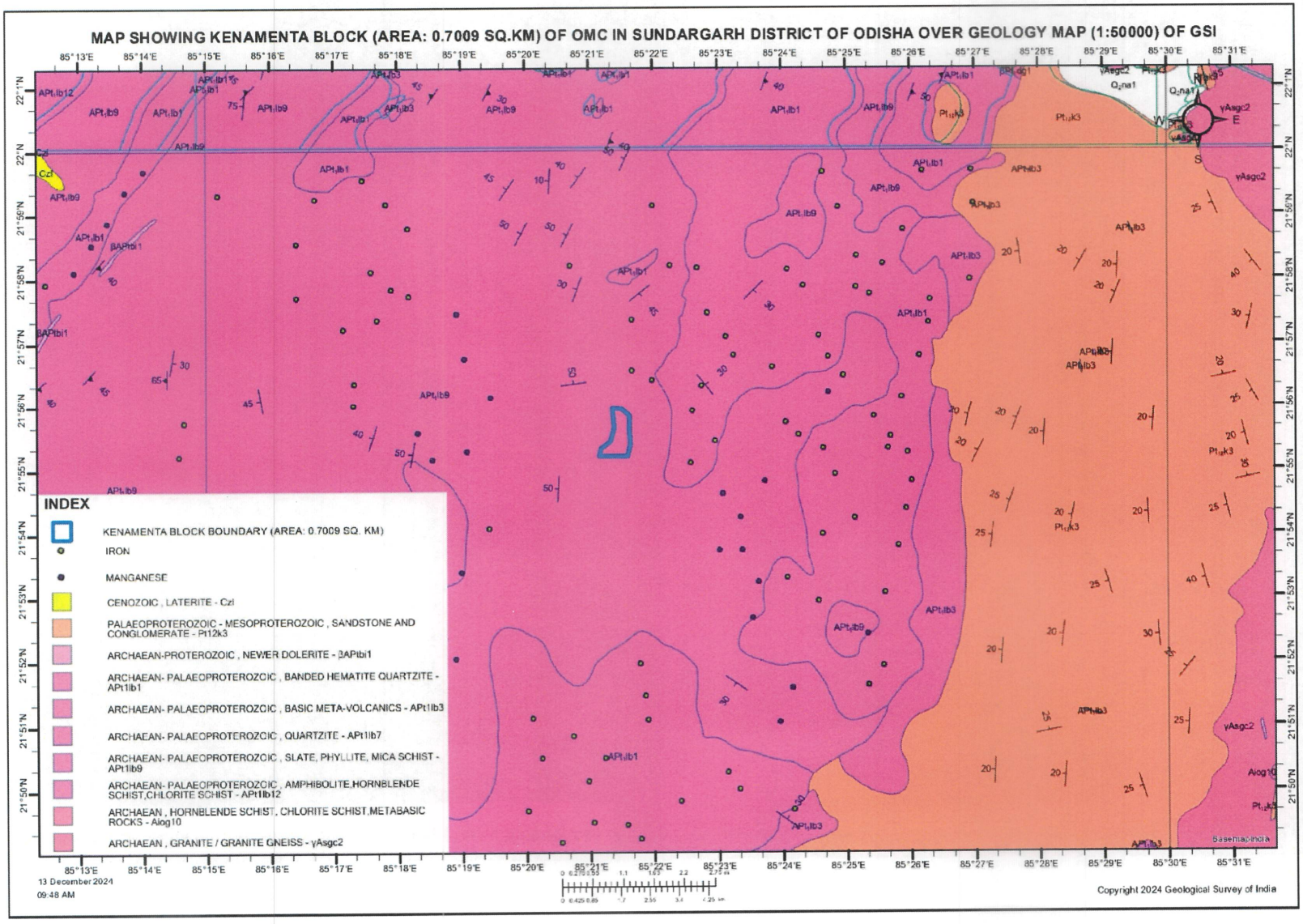

MAP SHOWING KENAMENTA BLOCK (AREA: 0.7009 SQ.KM) OF OMC IN SUNDARGARH DISTRICT OF ODISHA OVER GEOLOGY MAP (1:50000) OF GSI
INDEX
KENAMENTA BLOCK BOUNDARY (AREA: 0.7009 SQ. KM)
IRON
MANGANESE
CENOZOIC , LATERITE - Czl
PALAEOPROTEROZOIC - MESOPROTEROZOIC , SANDSTONE AND CONGLOMERATE - Pt12k3
ARCHAEAN-PROTEROZOIC , NEWER DOLERITE - ßAPtbi1
ARCHAEAN- PALAEOPROTEROZOIC , BANDED HEMATITE QUARTZITE - APt1lb1
ARCHAEAN- PALAEOPROTEROZOIC , BASIC META-VOLCANICS - APt1lb3
ARCHAEAN- PALAEOPROTEROZOIC , QUARTZITE - APt1lb7
ARCHAEAN- PALAEOPROTEROZOIC , SLATE, PHYLLITE, MICA SCHIST - APt1lb9
ARCHAEAN- PALAEOPROTEROZOIC , AMPHIBOLITE,HORNBLENDE SCHIST,CHLORITE SCHIST - APt1lb12
ARCHAEAN , HORNBLENDE SCHIST, CHLORITE SCHIST,METABASIC ROCKS - Alog10
ARCHAEAN , GRANITE / GRANITE GNEISS - γAsgc2
13 December 2024
09:48 AM
Copyright 2024 Geological Survey of India

PLATE IV

PLAN SHOWING KENAMENTA BLOCK (AREA 0.7009 SQ.KM) IN SUNDARGARH DISTRICT, ODISHA OVER REGIONAL GEOLOGY MAP OF BONAI KEONJHAR IRON ORE BELT

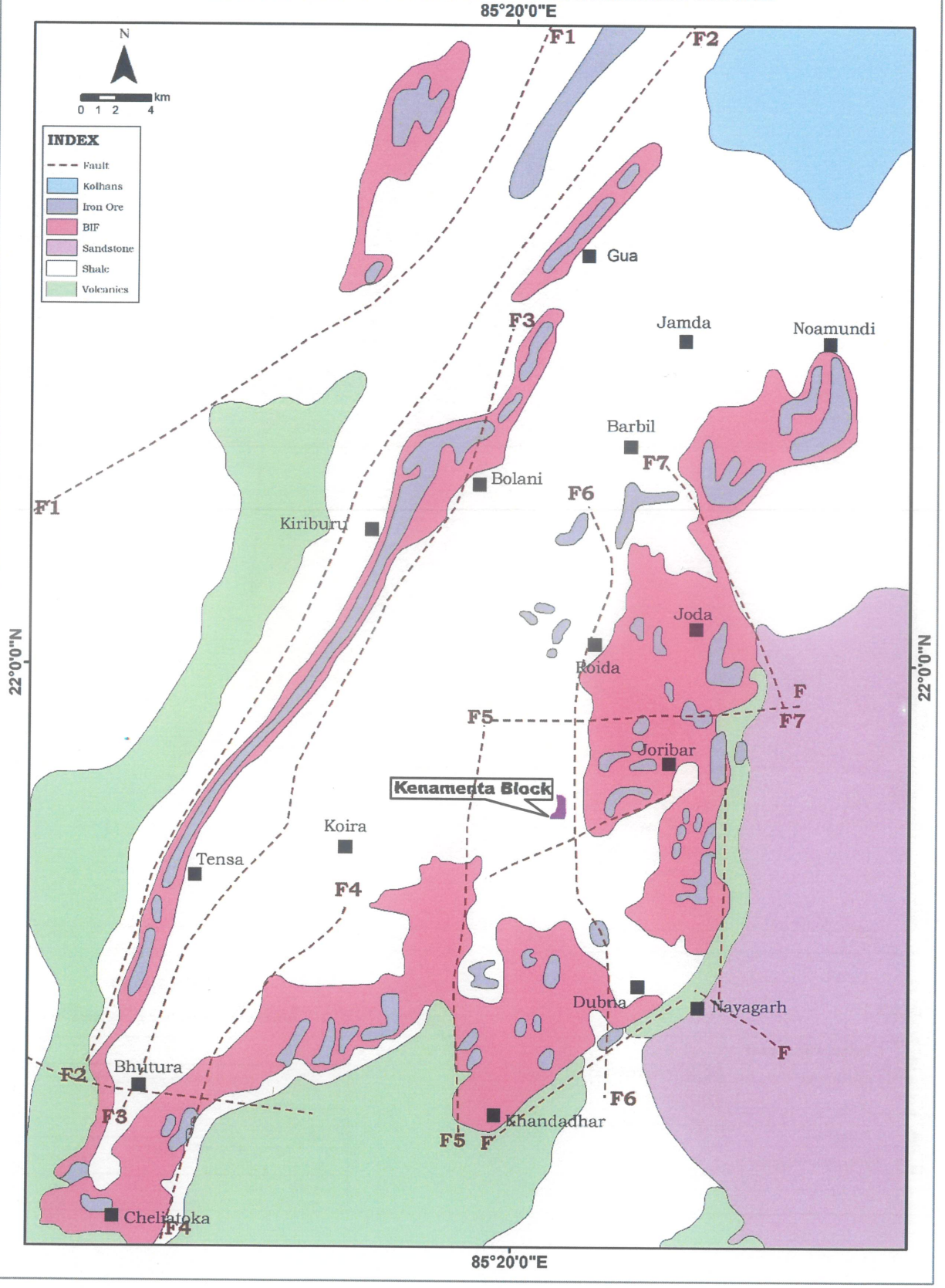
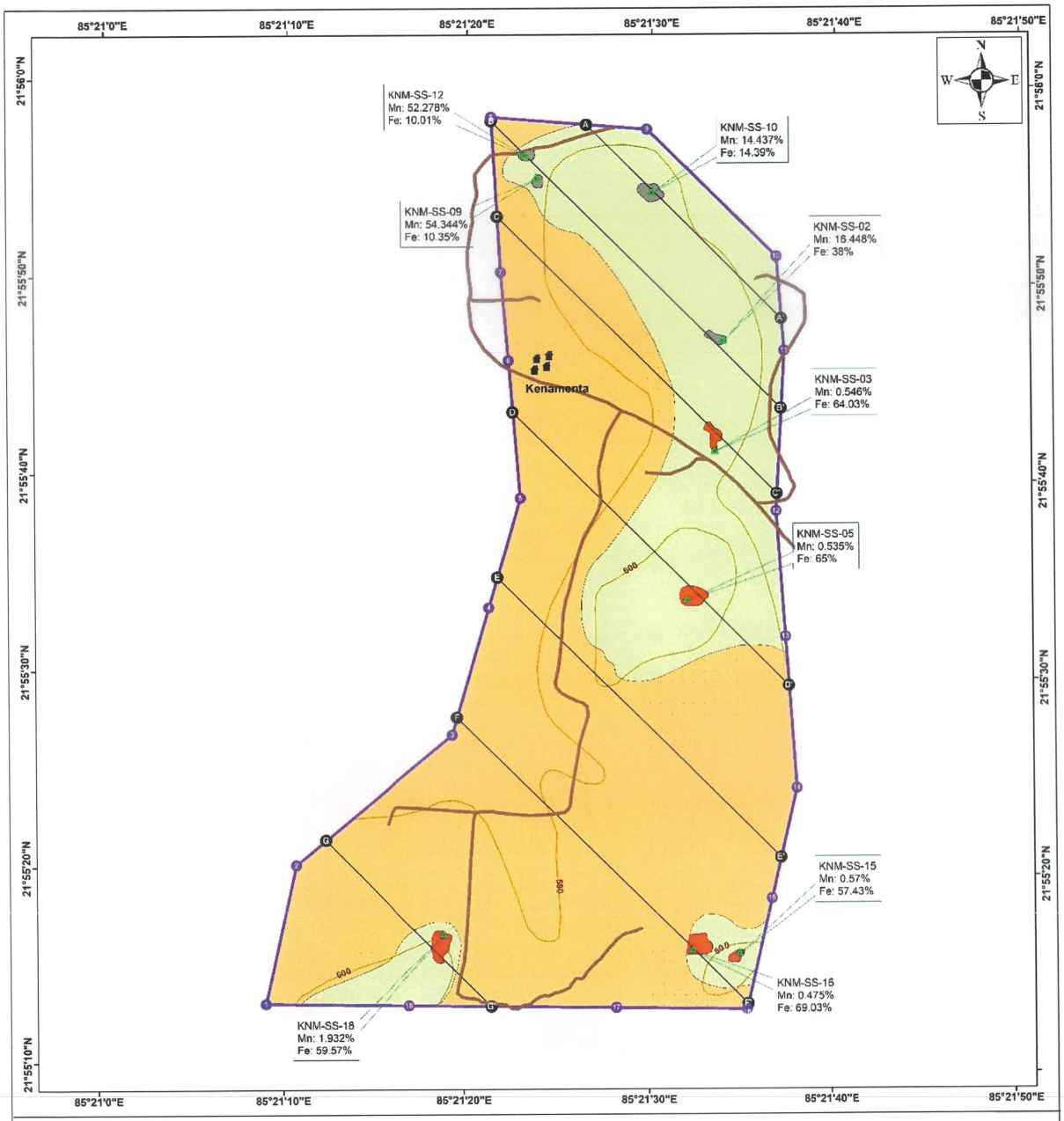


PLATE V



INDEX

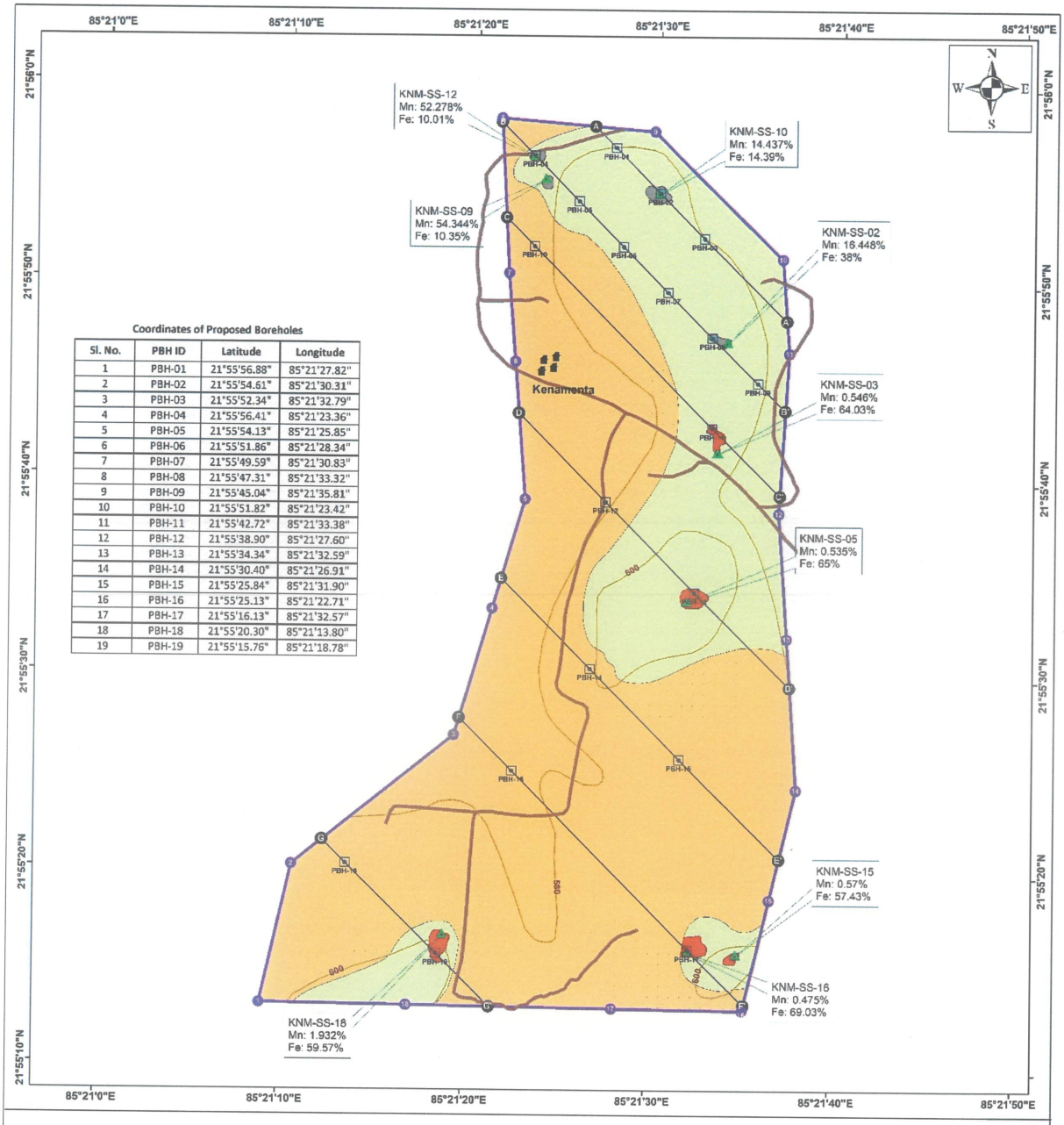
- Kenamenta Block Boundary
- Existing Road
- Contour
- Section line
- Surface Sample Location
- Soil
- Manganese Ore
- Iron Ore
- Cherty Quartzite

SCALE 1:4,000

0 50 100 200 300 400 Meters

OMC	ODISHA MINING CORPORATION LTD.
NAME OF BLOCK	KENAMENTA BLOCK
AREA OF BLOCK	0.7009 SQ.KM
NAME OF PLAN	**GEOLOGICAL PLAN**
SCALE	1: 4000
PLATE	V

PLATE VI



Coordinates of Proposed Boreholes

Sl. No.	PBH ID	Latitude	Longitude
1	PBH-01	21°55'56.88"	85°21'27.82"
2	PBH-02	21°55'54.61"	85°21'30.31"
3	PBH-03	21°55'52.34"	85°21'32.79"
4	PBH-04	21°55'56.41"	85°21'23.36"
5	PBH-05	21°55'54.13"	85°21'25.85"
6	PBH-06	21°55'51.86"	85°21'28.34"
7	PBH-07	21°55'49.59"	85°21'30.83"
8	PBH-08	21°55'47.31"	85°21'33.32"
9	PBH-09	21°55'45.04"	85°21'35.81"
10	PBH-10	21°55'51.82"	85°21'23.42"
11	PBH-11	21°55'42.72"	85°21'33.38"
12	PBH-12	21°55'38.90"	85°21'27.60"
13	PBH-13	21°55'34.34"	85°21'32.59"
14	PBH-14	21°55'30.40"	85°21'26.91"
15	PBH-15	21°55'25.84"	85°21'31.90"
16	PBH-16	21°55'25.13"	85°21'22.71"
17	PBH-17	21°55'16.13"	85°21'32.57"
18	PBH-18	21°55'20.30"	85°21'13.80"
19	PBH-19	21°55'15.76"	85°21'18.78"

INDEX

- Kenamenta Block Boundary
- Existing Road
- Contour
- Section line
- Surface Sample Location
- Proposed Borehole (G3)
- Soil
- Manganese Ore
- Iron Ore
- Cherty Quartzite

SCALE 1:4,000

0 50 100 200 300 400 Meters

OMC	ODISHA MINING CORPORATION LTD.
NAME OF BLOCK	KENAMENTA BLOCK
AREA OF BLOCK	0.7009 SQ.KM
NAME OF PLAN	**PROPOSED BOREHOLE PLAN**
SCALE	1: 4000
PLATE	VI