Proposal for Salaikena Block, Keonjhar District, Odisha for Reconnaissance Survey (G4 Stage) under NMET

(Gold)

By

OMC

Place: Bhubaneshwar

Date : 20/07/2023

Summary of the Block for Reconnaissance Survey (G4 Stage)
GENERAL INFORMATION ABOUT THE BLOCK

<table>
<tr><td></td><td>Features</td><td>Details</td></tr>
<tr><td></td><td>Block ID</td><td>Salaikena</td></tr>
<tr><td></td><td>Exploration Agency</td><td>OMC</td></tr>
<tr><td></td><td>Commodity</td><td>Gold</td></tr>
<tr><td></td><td>Mineral Belt</td><td>Bonai-keonjhar IOG Belt</td></tr>
<tr><td></td><td>Completion Period with entire Time schedule to complete the project</td><td>15 Months</td></tr>
<tr><td></td><td>Objectives</td><td>1. To identify and demarcate the chert/quartzite bands, quartz veins, older schists, shear zones by geological mapping in 1:12,500 scale.
2. To conduct geochemical survey (including stream, rock geochemistry and soil to identify the anomalous zones.
3. To cover the area by detail magnetic survey at close intervals to identify the structures related to mineralization.
4. To cover the identified key target areas from geochemical and magnetic survey by IP to identify the drilling targets
5. To prove the mineralized zones and check the subsurface continuity of the potential mineralized zones by scout drilling</td></tr>
<tr><td></td><td>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</td><td>The current exploration work will be carried out by OMC</td></tr>
<tr><td></td><td>Name/ Number of Geoscientists</td><td>Geologist – 01 HQ (150 Days)
Geologist – 02 Field (480 Days)</td></tr>
<tr><td></td><td>Expected Field days (Geology) Geological Party Days</td><td>500 days</td></tr>
<tr><td>1.</td><td>Location</td><td>
<table>
<tr><th>Block Boundary Cardinal Point</th><th>Easting</th><th>Northing</th><th>Latitude</th><th>Longitude</th></tr>
<tr><td>A</td><td>331997.1</td><td>2367146</td><td>21° 23’ 55.4892”</td><td>85° 22’ 23’ 45.4692”</td></tr>
<tr><td>B</td><td>335726.1</td><td>2369727</td><td>21° 25’ 20.6256”</td><td>85° 22’ 46.632”</td></tr>
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	Villages	Bagamunda,Barhadebata,Bhadimara,Dandargauni,Dumuria,Kalapokhari,Parunapani,Salaikana,Sonapenth and Telkoi
	Tehsil/ Taluk	Kanjipani
	District	Keonjhar
	State	Odisha
2.	**Area (hectares/ square kilometres)**	
	Block Area	28.765 Sq Km
	Forest Area	Data not Available
	Government Land Area	Data not Available
	Private Land Area	Data not Available
3.	**Accessibility**	
	Nearest Rail Head	Nearest Rail Head: Talchir (Odisha) Railway station is about 70 km south of Telkoi direction from the block.
	Road	National Highway No. 6 passes 4 km north of Salaikena, and Pallahara-Telkoi bus route passes 5 km west of Salaikena
	Airport	Bhubaneshwar Airport 184 km from Salaikena
4.	**Hydrography**	
	Local Surface Drainage Pattern (Channels)	The small stream originating in the hilly terrain fall in to the form Hanumantia Nala which is a source of gold bearing gravels. The Hanumantia nala flows east of Salaikena in a southerly direction to meet Samakoi Nadi which is a tributary of the Brahmini river.
	Rivers/ Streams	The Hanumantia nala flows east of Salaikena in a southerly direction to meet Samakoi Nadi which is a tributary of the Brahmini river.
5.	**Climate**	
	Mean Annual Rainfall	150 cm/annum
	Temperatures (December) (Minimum)	15°C
	Temperatures (June) (Maximum)	45°C
6.	**Topography**	
	Toposheet Number	73G/7
	Morphology of the Area	The hills surrounding the plains are occupied by the younger volcanic flows which attain a general height of 450 m above the MS L. The small stream originating in the hilly terrain fall in to the form Hanumantia Nala which is a source of gold bearing gravels. The Hanumantia nala flows east of Salaikena in a southerly direction to meet Samakoi Nadi which is a tributary of the Brahmini river.
7	**Availability of baseline geoscience data**	
	Geological Map (1:50K/ 25K)	Bhukosh Map on scale 1:50,000

	Geochemical Map	**Not Available**
	Geophysical Map (Aeromagnetic, ground geophysical, Regional as well as local scale GP maps)	**Aeromagnetic Available**
8.	**Justification for taking up Reconnaissance Survey / Regional Exploration**	The area was investigated by DoMG and one drillhole was drilled. Saleikena lies at a distance of 65 kms from Keonjhar., negotiable by a fair weather road via Telkoi. The area is featured in toposheet No. 73 G/7 and also approached through NH-6, via Barahdebta. The investigation for gold in the area was initiated in field season 1970-71 of DGOM. The possible source of gold indication in the area can be the quartz veins which exhibit the alterations and indications of sulphidisation The airborne magnetic image displays a moderate magnetic response with a feeble East-West linear structure cutting the block. Out of the 100 historic samples 27 samples exhibited gold values for traces to 67.6 g/t. The vertical hole has been drilled in the centre of the area upto a depth of 79.59 meters. Gold values of 0.6 and 0.3 g/t have been obtained by fire assay from amphibolite with bands of vein quartz at depth from 58.0 – 59.74m an 72 to 73.5 m respectively. Pitting and trenching revealed placer zones between two small hilllocks NE of Saleikena village. The placer zone has been traced for a strike length of 300 meters with width varying from 10 to 40 meters. Fine dust pellets and nuggets of gold have been recovered historically in the test pannings. Maximum yield of gold through panning has been 1 to 1.5 meters thick gravel zone below 0.5 meter of thick soil cover. The gravels consists of angular fragments of phyllite, quartz-sericite-schist and Quartz.

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

1. **Block Summary**

1.1. The area under investigation forms a part of toposheet 73 G/7 and lies between the North Latitudes 2l°23' and 21°28’ and East Longitudes 85° 23' and 85° 25'. Salaikena is a village nearest to the place of the work, and is situated 13 km away from the block headquarters Telkoi, 65 km from district headquarters Keonjhar and 310 km away from the State Capital Bhubaneswar. Calcutta-Bombay, National Highway No.6 passes 4 km north of Salaikena, and Pallahara-Telkoi bus route passes 5 km west of Salaikena. An MIP Road (unmetalled) leading to Hanumantia Minor Irrigation Project runs very close to the area of operation. The nearest railhead is situated at Talchir (in SE Railway) which is 70 km south of Telkoi.

1.2. The block falls in Part of the Survey of India Toposheet No. 73 G/7 covering an area of 28.7 Sq Km. Nearby villages viz. Bagamunda Barhadebata Bhadimara Dandargauni,,Dumuria Kalapokhari, Parunapani, Salaikena, Sonapenth and Telkoi etc. are well known for gold occurrences. The co-ordinates of the cardinal points of the block are given in the table below:

Block Boundary Cardinal Point	Easting	Northing	Latitude	Longitude
A	331997.1	2367146	21° 23’ 55.4892”	85° 22’ 23’ 45.4692”
B	335726.1	2369727	21° 25’ 20.6256”	85° 22’ 46.632”
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1.3. The area around Telkoi and Salaikena constitutes a part of greenstone belt comprising meta-volcanics and the associated phyllites and schists. The volcanics are mostly andesites and andesite-basalts. Basic intrusives viz. meta-gabbro and dolerite cut across the meta-volcanics. The youngest intrusive in this area is the granophyre 2 km west of Telkoi along a NW-SE shear zone mapped by R.N. Banerjee in the year 196l in toposheet 73 C/7. Quartz veins traverse all these rocks.

1.4. Primary gold mineralisation is mainly associated with the chert bands which occur as part of relict schist belt within tonalites. Detailed study shows that gold-arsenopyrite mineralisation is concentrated within the chert bands at their contact with schists and tonalities and also in thin silica and calcite veins occurring as fracture fillings within the chert. The quartz vien intrusives within the granites away from chert band do not show gold mineralisation, whereas micro veins of quartz intrusives within granite in close association with auriferous chert bands show gold mineralisation (Upadhye et. al., GSI, 1994).

1.5. Weathering and erosion of mineralised zones and concentration of gold in Recent and Quaternary placers of Ib and Mainly drainages is the secondary gold mineralization. The panning activity is mainly confined to Sonajori river. Many other localities of panning for gold are active

along Ib, Maini, Utial, Talda, Bharari, Makarkunda rivers and their tributaries. Besides this, panning of colluvial placers in the vicinity of different chert bands is carried out during monsoon.

1.6. The area was investigated by DoMG and one drillhole was drilled. Saleikena lies at a distance of 65 kms from Keonjhar., negotiable by a fair weather road via Telkoi. The area is featured in toposheet No. 73 G/7 and also approached through NH-6, via Barahdebta.

1.7. The investigation for gold in the area was initiated in field season 1970-71 of DGOM. Activities covered in the area:

1.8. Geological mapping-1:63360m, test panning of Nala beds, Trial Excavation and sampling. Large scale geological mpping (1:2000) of the area completed in 1971-72 field season. Simultaneous panning of the auriferous zone carried out. One bore hole was drilled to depth of 79.59 meters in placer zone during field season 1973-74.

1.9. Pitting and trenching revealed placer zones between two small hilllocks NE of Saleikena village. The placer zone has been traced for a strike length of 300 meters with width varying from 10 to 40 meters. Fine dust pellets and nuggets of gold have been recovered historically in the test pannings. Maximum yield of gold through panning has been 1 to 1.5 meters thick gravel zone below 0.5 meter of thick soil cover. The gravels consists of angular fragments of phyllite, quartz-sericite-schist and Quartz.

1.1. The vertical hole has been drilled in the centre of the area upto a depth of 79.59 meters. The drillhole intersected anomalous gold values at depth of 70-meter depth.

1.2. Later GSI also worked in the area in field seasons and a comprehensive report on the study area is presented. The results of the work revels the following:

1.2.1. Panning results of C-zone and gravel material collected in and around the old placer excavation zone near Salaikena show that fine dusts, small pellets and grains of gold are present in these material just above the saprolite horizon. No gold could be obtained by washing the material from the saprolite horizon. The results of test panning are given in appendix-I and location of test pits in plate V. It could be seen that most of the positive test pits fall more or less within the old placer excavation zone or very close to it. The results have thus helped in identifying a block of area for undertaking systematic pitting and bulk sampling.

1.2.2. 80 bulk samples (samples Nos. 100 to 179) analysed by the Bharat Gold Mines Ltd. fall in the cross-lines No and N3 and N4. Samples from the N3 crossline did not give any positive results for gold (assay values always less than 0.1 ppm Au) while gravel horizon samples from N4 cross-line gave higher values upto 0.6 ppm Au and the silver showed a rising trend upto 4 ppm in bed rock/saprolite (Appendix II, III, IV). A section along cross-line N4 showing Au, Ag values in pits is given in plate VI of the report. It could be seen from the section that the Ag and Au peaks fall in a part of ferruginous phyllite immediately overlying the altered metabasic in the valley. Altogether 95 bulk samples (nos. 180 to 273) were analysed for determination of Au and Ag in the chemical laboratories of GSI in Calcutta. These samples

were collected from pits along cross-lines N4, N5, N6 and N7. The results show that the gold values fall below 0.5 ppm in all the samples. Only 6 samples showed Ag values ranging from 1.0 ppm to 2.00 ppm, while the rest fall below the detection limit. Some grab samples collected from the shear and silicified zone north of Salaikena have yielded more than 1000 ppm copper. Since gold is often associated with sulphides, this zone may be examined by trenching, pitting and sampling and if necessary, by drilling.

1.2.3. It is recommended by GSI in their reports that In the Salaikena block the detailed mapping on 1:15000 scale and sampling at suitable interval should be extended to cover the areas southeast and southwest of Salaikena mounds for locating possible mineralized zones, if any.

2. Previous Work

The investigation for gold in the Telkoi Block (toposheet 73 G/7) was taken up in pursuance of the Annual Programme of the Geological Survey of India for the field season 1979-80 (Code No. P/73/G/ORS/79/8). An area of 60 sq km by reconnaissance survey, 30 sq km by large scale geological mapping on 1:15,840 scale and 1.1 sq km of detailed mapping on 1:2000 scale by plane table was covered besides undertaking pitting of 260 cu m and collection of 175 bulk and 63 grab samples, for gold and silver. The aim of the investigation was to search for the gold bearing lodes, if any in the area.

The area investigated comprises rocks belonging to pre Cambrian meta-volcanic and metasedimentary sequence (of Iron Ore Group) such as quartz-sericite schist, phyllite, silicified schist, ferruginous shales and phyllites with igneous intrusives and extrusives. Thin quartz veins of white and grey colour are found mostly within the phyllite. Some of the quartz veins show minor disseminations of pyrite and pyrrhotite. Gold was recovered in the past as well as in the present times from the gravel zone above the phyllite bedrock near Salaikena.

The area for detailed prospecting was delineated by panning C-zone samples inside and outside the old placer excavation area near Salaikena. The area showing positive gold value or panning was selected for bulk sampling. Samples each weighing about 1tonne was taken from gravel zone, saprolite .and bed rock horizons from 1 m x 1 m pits laid at 5 m interval along gross-lines at 50 m interval across the strike of the foliation. The samples were crushed and reduced in stages to 1400 gm weight using standard sieves and meshes. These samples were sent to the chemical laboratories of the BGML and GSI.

The analysis of 80 bulk samples by BGML and the rest by GSI laboratories shows that gold content, in saprolite and bed rock horizon are below 0.1 ppm and 0.5 ppm respectively. However, the gold values in gravel zone on N-4 cross-line range upto 0.6 ppm. It is interesting to note that most of the silver values in gravel zone, saprolite and bed rock horizons are consistently above the detection limits in this cross-line (i.e. (Pits No. 1 $N4E_1$ to 3 $N4E_2$) and the value range between 1 ppm to 4 ppm.

On the basis of the present investigation test borehole TK-1 was suggested on N-4 cross-line to test the mineralisation at depth. The analytical results of 175 bulk and 63 grab samples indicate uniform distribution of Cu, Co, Ni, V and Ag elements but of low level of confidence, (i.e. only upto meant 1st standard deviation level). All other elements viz. is, As, Sb, Bi, W, Mo, Sn, Pb and Zn fall below the detection limits.
The details of the maps are shown in the below plates taken from GSI reports.

PLATE I: Detailed geological map of Salaikena area, Keonjhar dist., Orissa.

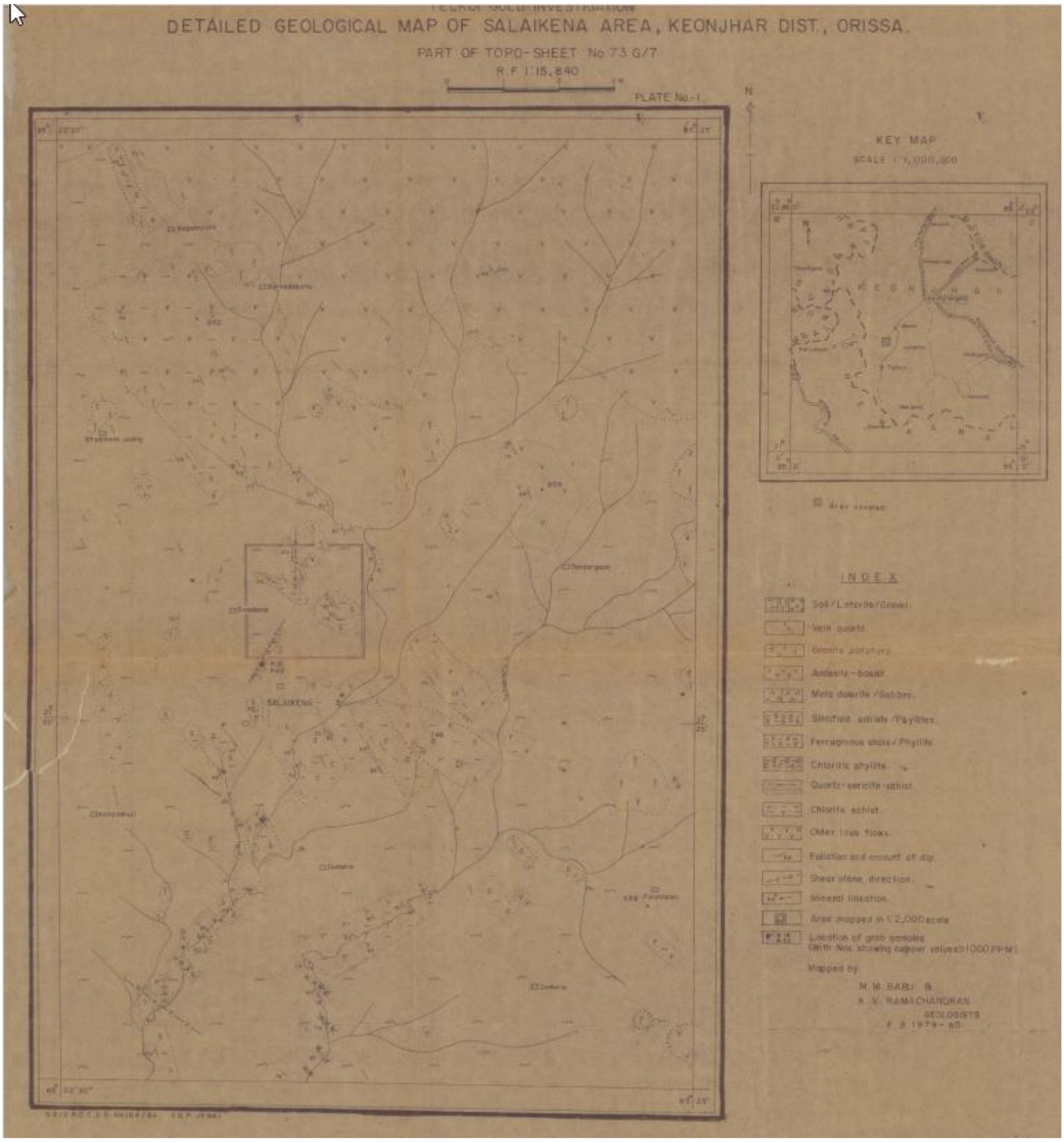

DETAILED GEOLOGICAL MAP OF SALAIKENA AREA, KEONJHAR DIST., ORISSA.
PART OF TOPO-SHEET No 73 G/7
R.F 1:15,840
PLATE No-1.
N
KEY MAP
SALAIKENA
INDEX
Soil/Laterite/Gravel.
Vein quartz.
Andesite-basalt.
Chloritic phyllite.
Quartz-sericite-schist.
Chlorite schist.
Older lava flows.
Foliation and amount of dip.
Shear plane direction.
Mineral lineation.
Area mapped in 1:2,000 scale
Location of grab samples
Mapped by
M.M. BABU &
K. V. RAMACHANDRAN
GEOLOGISTS

PLATE II: Telkoi gold investigation detailed geological map of Salaikena block, Keonjhar district, Orissa

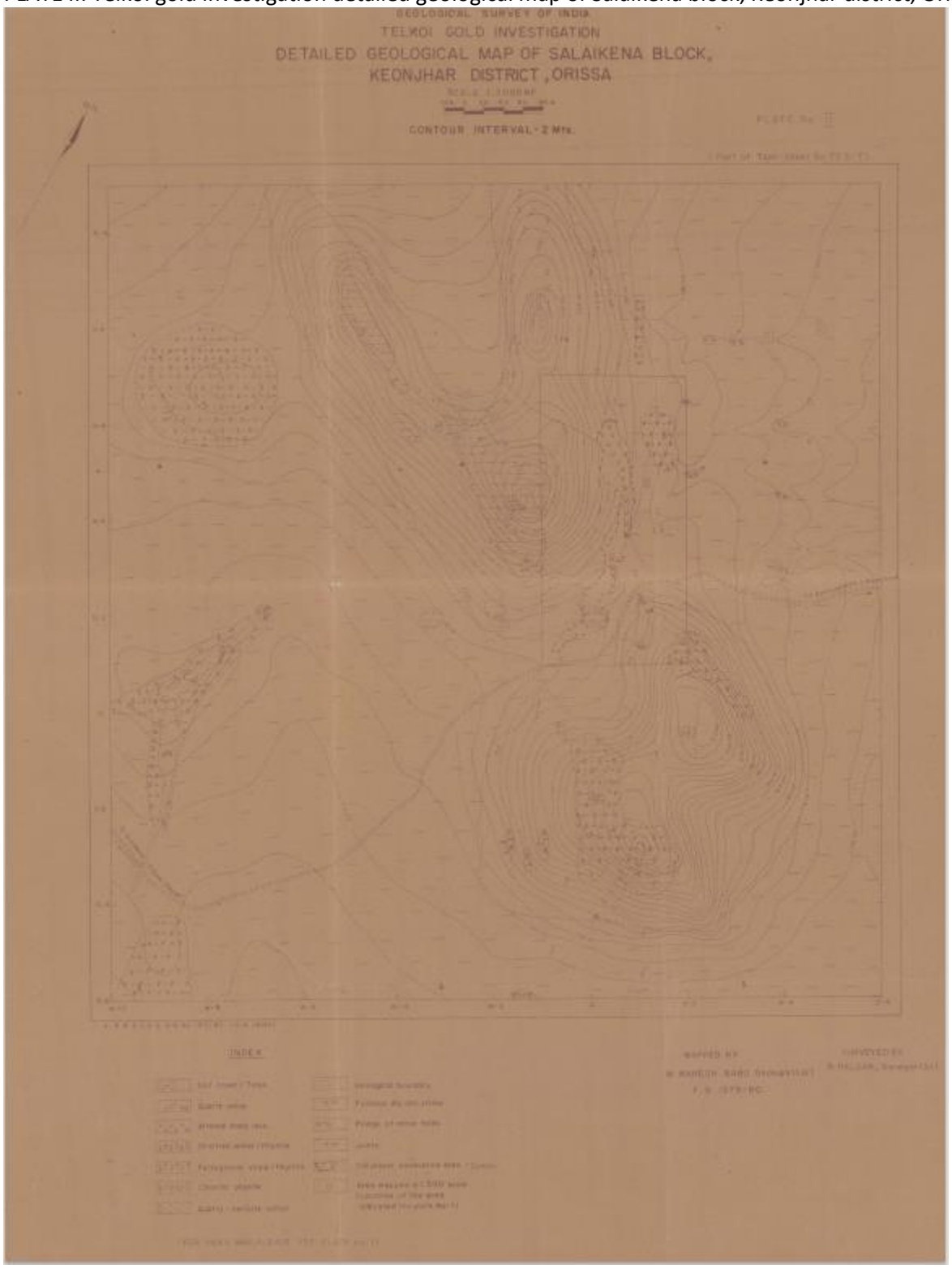


PLATE III: Telkoi gold investigation large scale geological map of the mineralized zone of Salaikena, Keonjhar districtst, Orissa, showing pit locations.

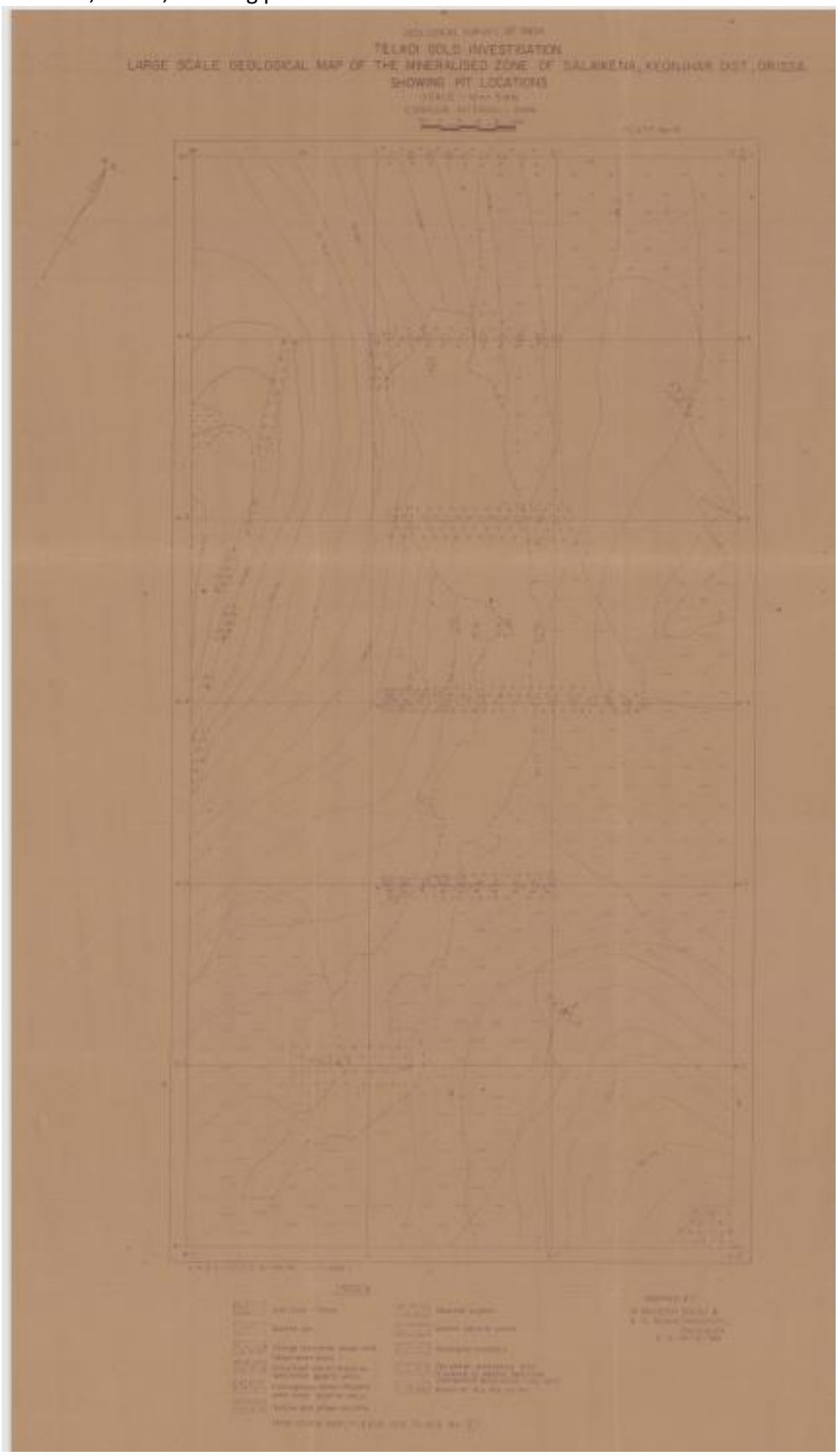


PLATE IV: Telkoi gold investigation map of the mineralised zone near Salaikena, Keonjhar dist., Orissa, showing pit locations with positive and negative incidence of gold from C-zone

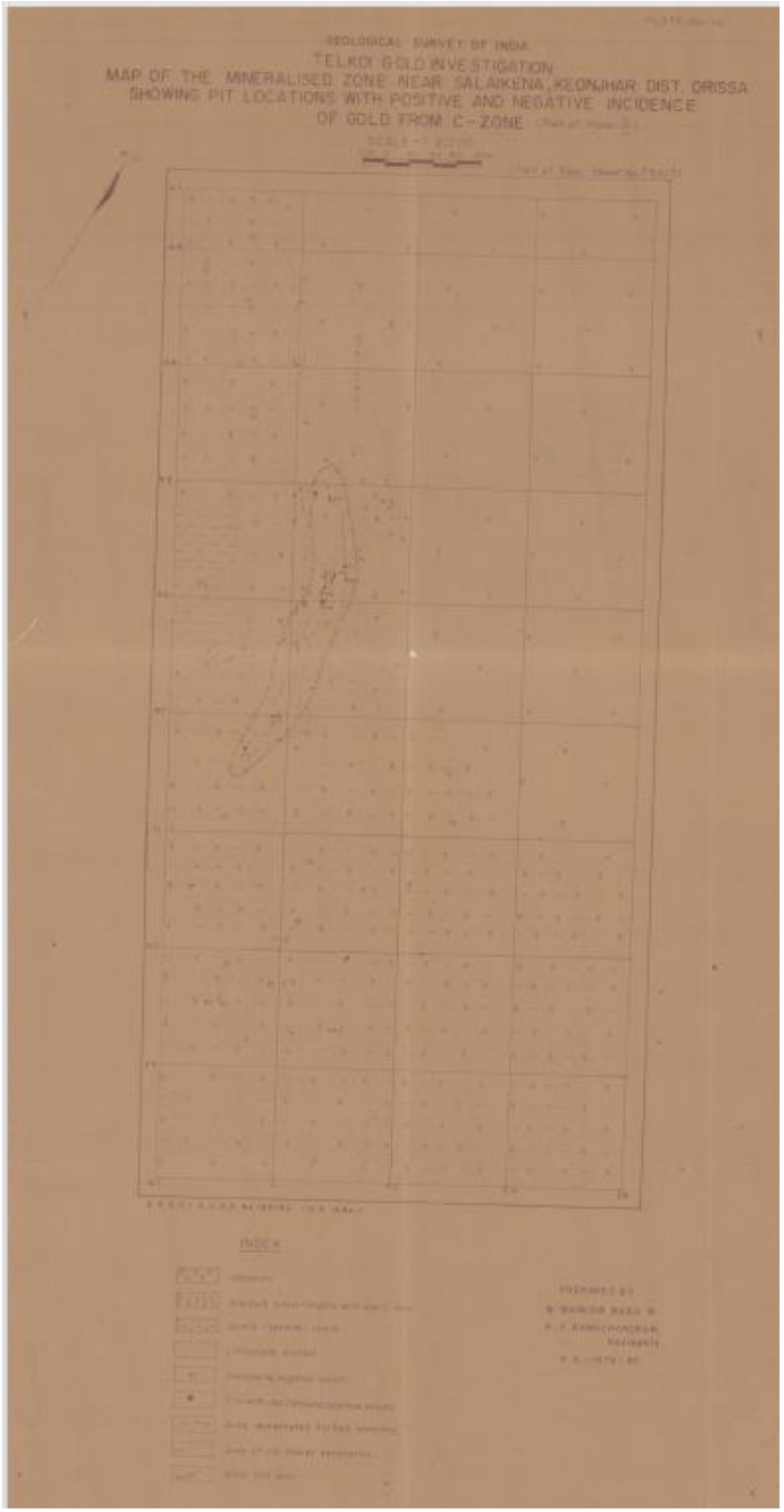


PLATE V (a): Telkoi gold investigation geochemical anomaly map for copper, nickel, cobalt & silver in 175 bulk samples collected from Salaikena area, Keonjhar dist, Orissa

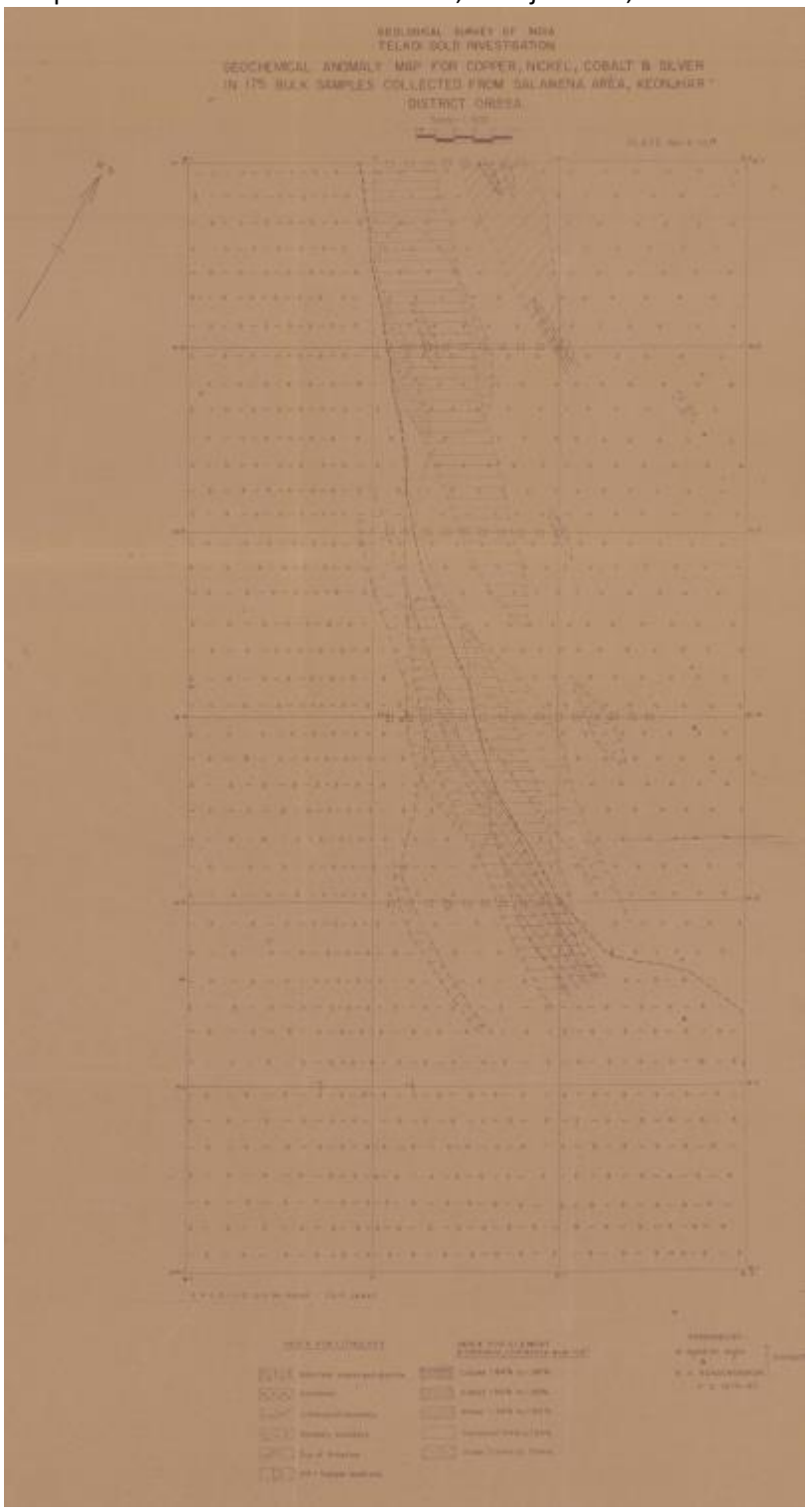


PLATE V (b): Telkoi gold investigation log/log probability curves for copper, vanadium, nickel, cobalt in bed rock, Saprolite & Gravee-zone bulk samples collected from Salaikena area, Keonjhar dist, Orissa

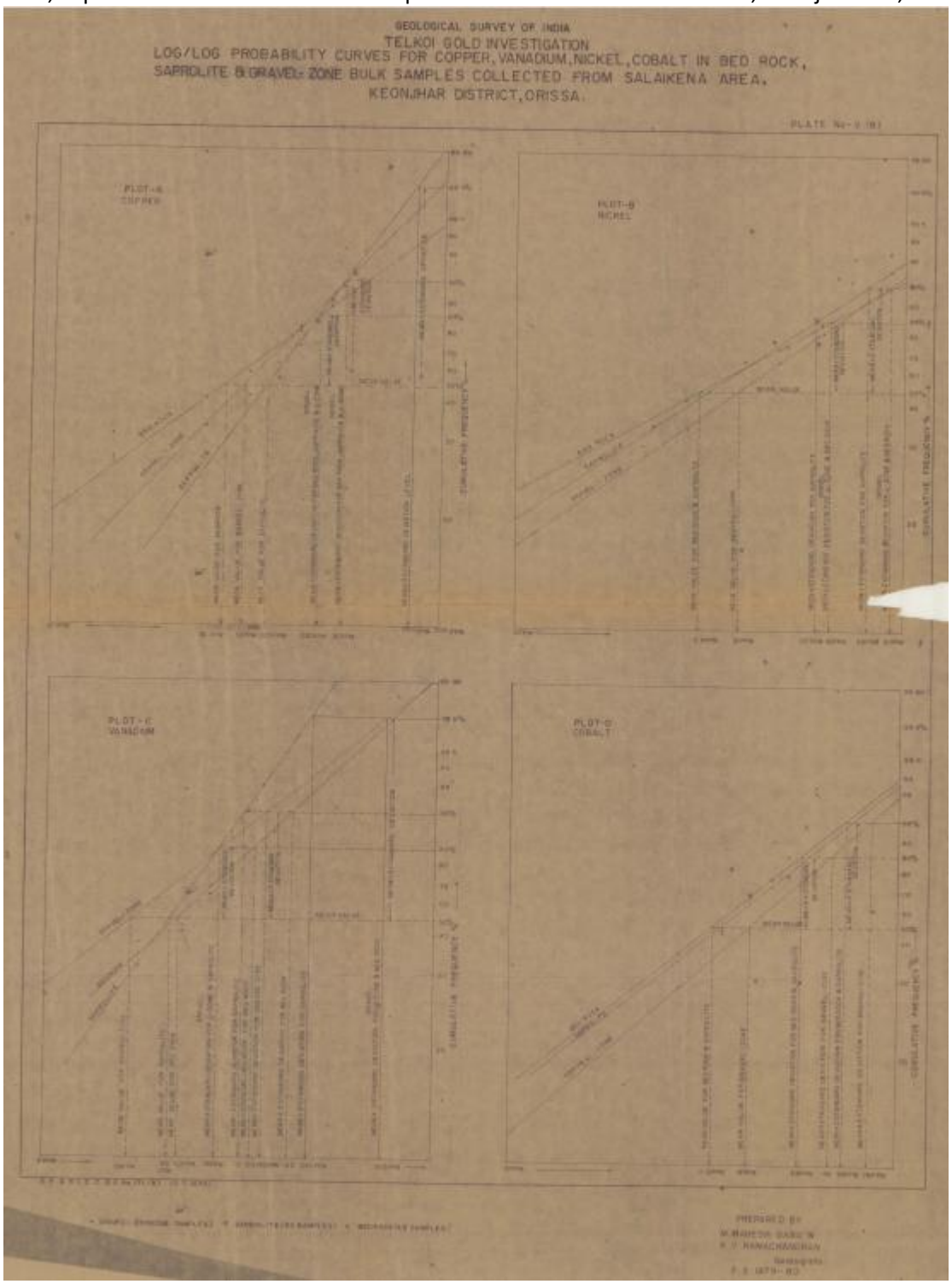
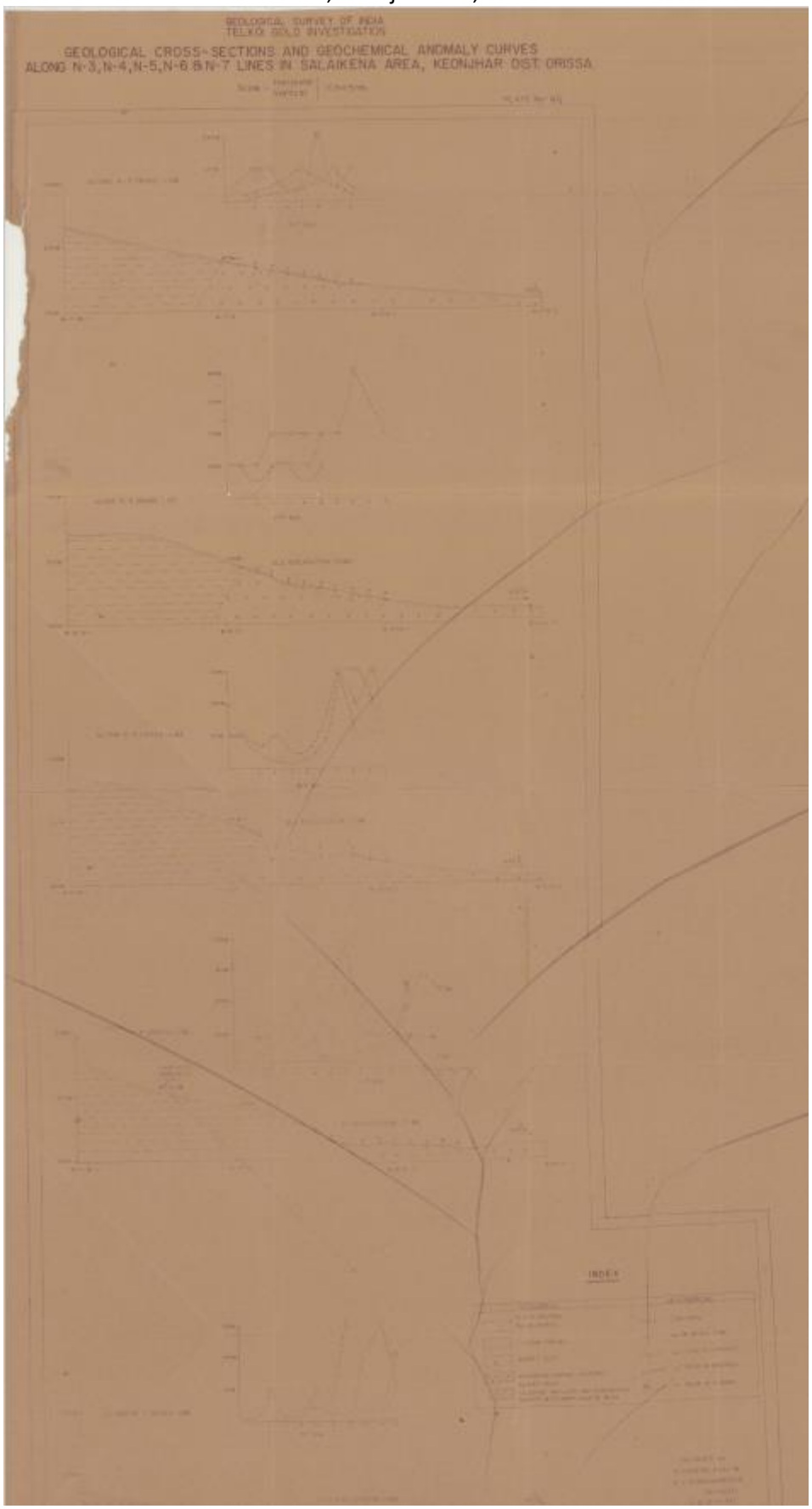


PLATE VI: Telkoi gold investigation geological cross-sections geochemical anomaly curves along n-3, n-4, n-5, n-6 & n-7 lines in Salaikena area, Keonjhar dist, Orissa



1. **Block description**

Block Boundary Cardinal Point	Easting	Northing	Latitude	Longitude
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2. **Planned Methodology**

Objective of the present exploration work is formulated as below:

1. To identify and demarcate the chert/quartzite bands, quartz veins, older schists, shear zonesin granite gneiss, by geological mapping in 1:12,500 scale

2. To conduct geochemical survey (including stream, rock geochemistry and soil to identify the anomalous zones.

3. To cover the area by detail magnetic survey at close intervals to identify the structures related to mineralization.

4. To cover the identified key target areas from geochemical and magnetic survey by IP to identify the drilling targtes

5. To prove the mineralized zones and check the subsurface continuity of the potential mineralized zones by scout drilling

3. **Nature Quantum and Target**

Components	G4 Stage	Unit	Quantity
Aerial reconnaissance			
Geological Survey	i) Geological Mapping at 1:12500	sq km	30
	ii) Updating available geological maps; Collating and Ground truthing of available GSI and DOMG maps	sq km	30
	iii) Detail Mapping at 1:2000 m of the target zones after Geological Mapping and magnetic survey	sq km	5
Geochemical Survey	i) Regional Rock sampling	Samples	250
	ii) Drainage and Morphometric Analysis	sq km	30

	iii) Stream Sampling	Samples	50
	iv) Soil Geochemistry	Samples	450
Geophysical Survey	Ground Magnetic / Drone	Line km	285
	IP Survey	Line km	50
Scout drilling	10 boreholes along the positive profiles delineated by IP and Geochemical Targets	Meters	1000
Sampling and Analysis	Primary Sample analysis 2 radicals (Au and As) by Fire Assay Rock+Stream+Soil – 750; Core-500;Check Samples-122	samples	1342
	Chemical Analysis (for Al, Ba, Bi, Ca, Cd, Co, Cu, Fe, K, Mg, Mn, Mo, Na, Ni, Pb, S, Sb, Sn, Sr, Ti, W, Zn, Cs, Ga, In, Te, Tl) Rock+Stream+Soil – 750; Core-400;Check Samples-122	samples	1342
Geological Report	Exploration Report [As per Mineral (Evidence of Mineral Contents) Rule-2015] /UNFC	No.s	1

4. Manpower deployment and Timelines

Time schedule (in months)																			
Sl. No.	**Activities**	**Unit**	**MONTHS** 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	**Total**
1	Camp Setting	Month	■															1 month
2	Geological Mapping (1: 12,500 scale)	Month	■	■	■													3 months
5	Rock Chip Sampling	Month	■	■	■													3 months
3	Drainage and morphometric analysis	Month	■	■														2 months
4	Stream Sampling			■	■	■												3 Months
6	Soil Geochemistry				■	■	■											3 months
7	Chemical analysis of Rock and Soil Samples	Nos.			■	■	■	■										720 Samples
8	Ground magnetics/Drone			■	■	■	■											285 LKM

9	IP survey																	50 LKM
10	Review of Field data																	1 month
11	Exploratory drilling (2 rigs) 1000	m.																1000 mts.
12	Geologist Party days in field (3 Party)	day	60	60	60	60	60					60	60	60				480
14	Labour (2 Nos) for 1 Geologist	day	120	120	120	120	120					120	120	120				960
15	Survey Party days (1 Party)			30	30									15				75
16	Labour (4 Nos.) for Survey Work			60	60									30				150
17	Chemical analysis of Core samples & Laboratory Studies	Nos.																500 Samples
19	Camp Demobilisation	Month																1 month
20	Geologist Party days in HQ		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	150
21	Geological Report Writing	Month																4 months
Note: 1. Commencement of project may be reckoned from the day the exploration acreage is available along with all statutory clearances.																		
2. Time loss on account of monsoon/agricultural activity/forest clearance/local law & order problem may be additional to above time line.																		

5. Break-up of expenditure

Tentative Cost has been estimated based on Schedule of Charges (SoC) of projects funded by National Mineral Exploration Trust (NMET) w.e.f. 01/04/2020. The total estimated cost for the Reconnaissance Survey is Rs. 486 Lakh. The summary of cost estimates is given in table below:

Sr. No. (SOC)	Work/Activity	Unit	Charges/ Cost (Rs.)	Total Unit	Total Cost (Rs.)
2.2.1.5	Drilling	per meters	12650	1000	12650000
1.5.1b	Geology & Survey Field	Man days	11000	555	6105000
1.5.1b	Geology HQ	Man days	9000	150	1350000
4.1.5a	Laboratory Chemical Analysis of precious metal in fire assay for Au	per sample	2380	1342	3193960

4.1.1	Laboratory Chemical Analysis of rock by conventional wet chemical method for 12 determinations (other than alumino silicates and phosphate rocks)	per sample	8157	1342	10946694
3.2a	Geophysics Magnetic	per station	1800	5700	10260000
3.4a	Geophysics IP	Line Km	69950	50	3497500
5.7	Charges for engaging skilled, semiskilled and unskilled workers for attending work associated with the mineral exploration project in the field (2 Numbers)	Per Labour	494	1110	548340
	Sub Total (1 to 5)				48551494
5.2	Geological Report with 5 copies		a minimum of 9 lakh or 3% of the Project Cost, whichever is more (if the value is exceeding Rs 300 lakhs)		1456544.82
TOTAL				**48551494**	
Total in Lakhs				**486**	

6. References

Karim M.A and Sahu N. K (1999) Preliminary exploration for gold in identification blocks of Keonjhar belt, Keonjhar district, Orissa
GSI – UE - 12821

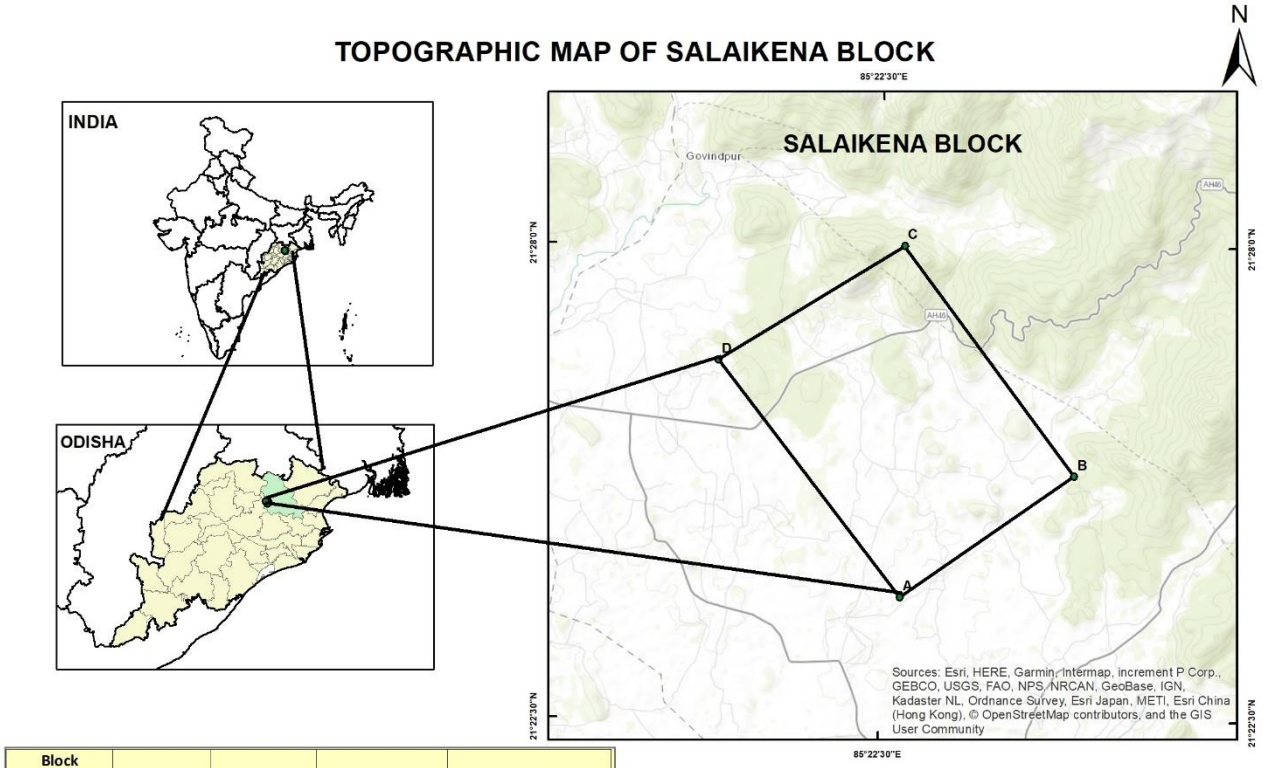
Singh A.K, Sahoo H.C, Mohapatra P.B, Rabbani S.G.A, Patnaik B.C, Mishra U.C, Mishra B.B. (1987) Report on the investigation for gold in Telkoi and Banspal blocks of Keonjhar district, Orissa
Department of Mining and Geology, Govt of Orissa
CO-3 KJR

REPORT ON THE INVESTIGATION FOR GOLD IN SALAIKANA AREA,TELKOI BLOCK, KEONJHAR DIST., ORISSA [PROGRESS REPORT FOR THE FIELD SEASON 1979-80] By M. Mahesh Babu & K. V. RamachandranGeologists

List of Plates

Plate 1: Geological map on 1:50,000 with location index.
Plate 2: Geological map/s on 1:50,000.
Plate 3: Ground geophysical map/s (NGPM) on 1:50,000.
Plate 4: Aeromagnetic map/s.
Plate 5: Proposed block boundary over Geological map.
Plate 6: Proposed block boundary over Land use/ Accessibility map. Not required at this stage.
Plate 7: Proposed block boundary over topographic map on 1:50,000.
Plate 8: Proposed Ground magnetic survey line within the block.

Plate 1: Topographic map of the block with location index.



Block Boundary Cardinal Point	Easting	Northing	Latitude	Longitude
A	331997.1	2367146	21° 23′ 55.4892″	85° 22′ 23′ 45.4692″
B	335726.1	2369727	21° 25′ 20.6256″	85° 22′ 46.632″
C	332108.4	2374674	21° 28′ 0.2964	85° 22′ 46.632
D	328121.1	2372238	21° 26′ 39.732″	85° 20′ 29.0328″

Plate 2: Geological map of the block on 1:50,000 geological map.

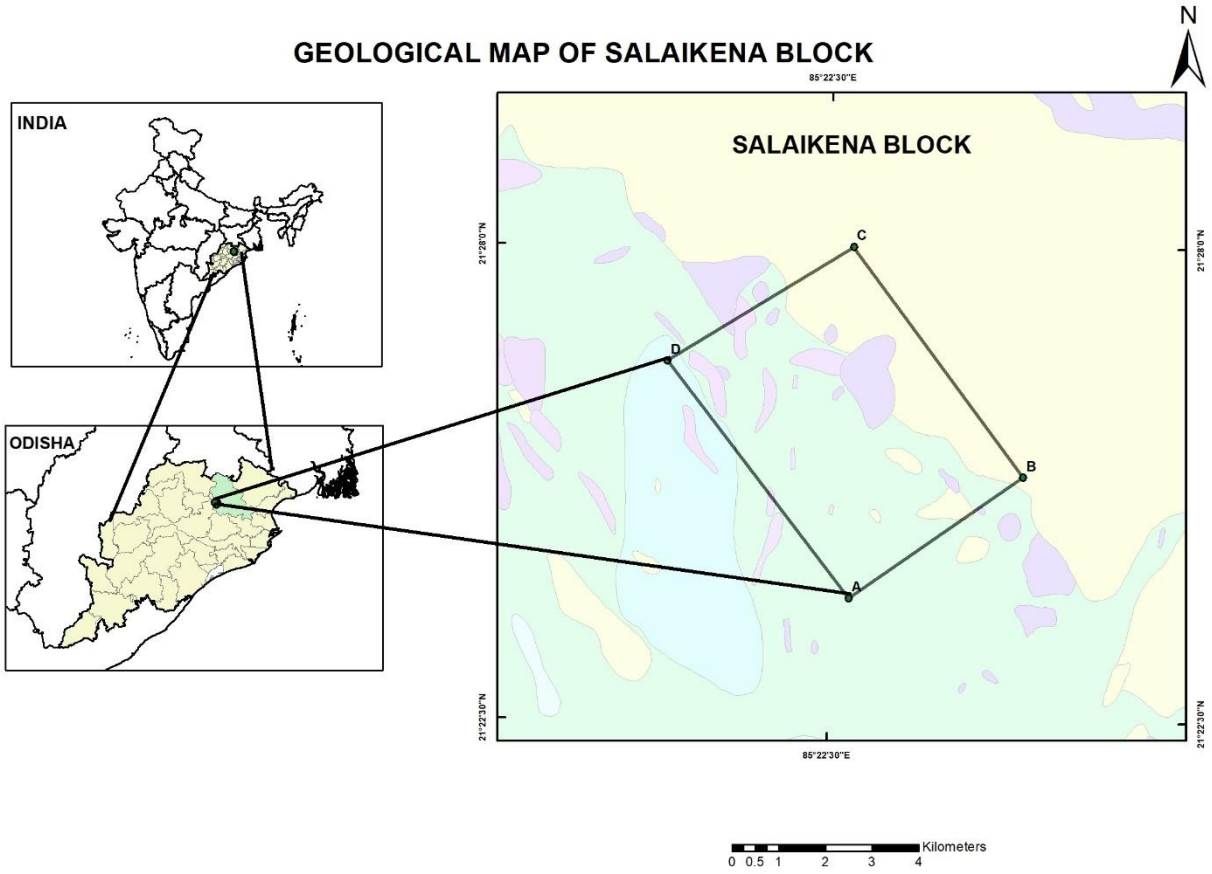
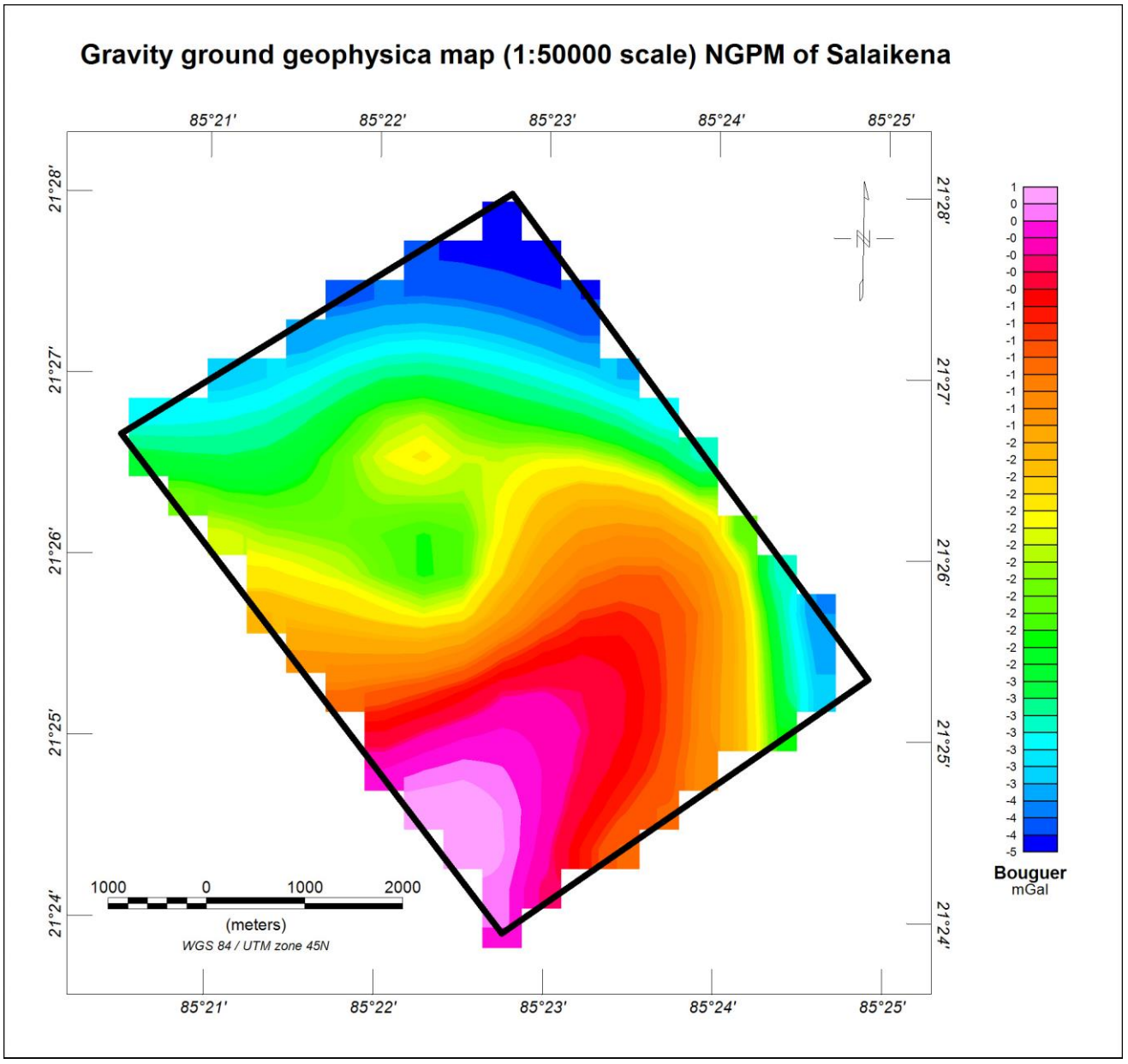


Plate 3: Ground geophysical map/s (NGPM) on 1:50,000.



Magnetic ground geophysica map (1:50000 scale) NGPM of Salaikena

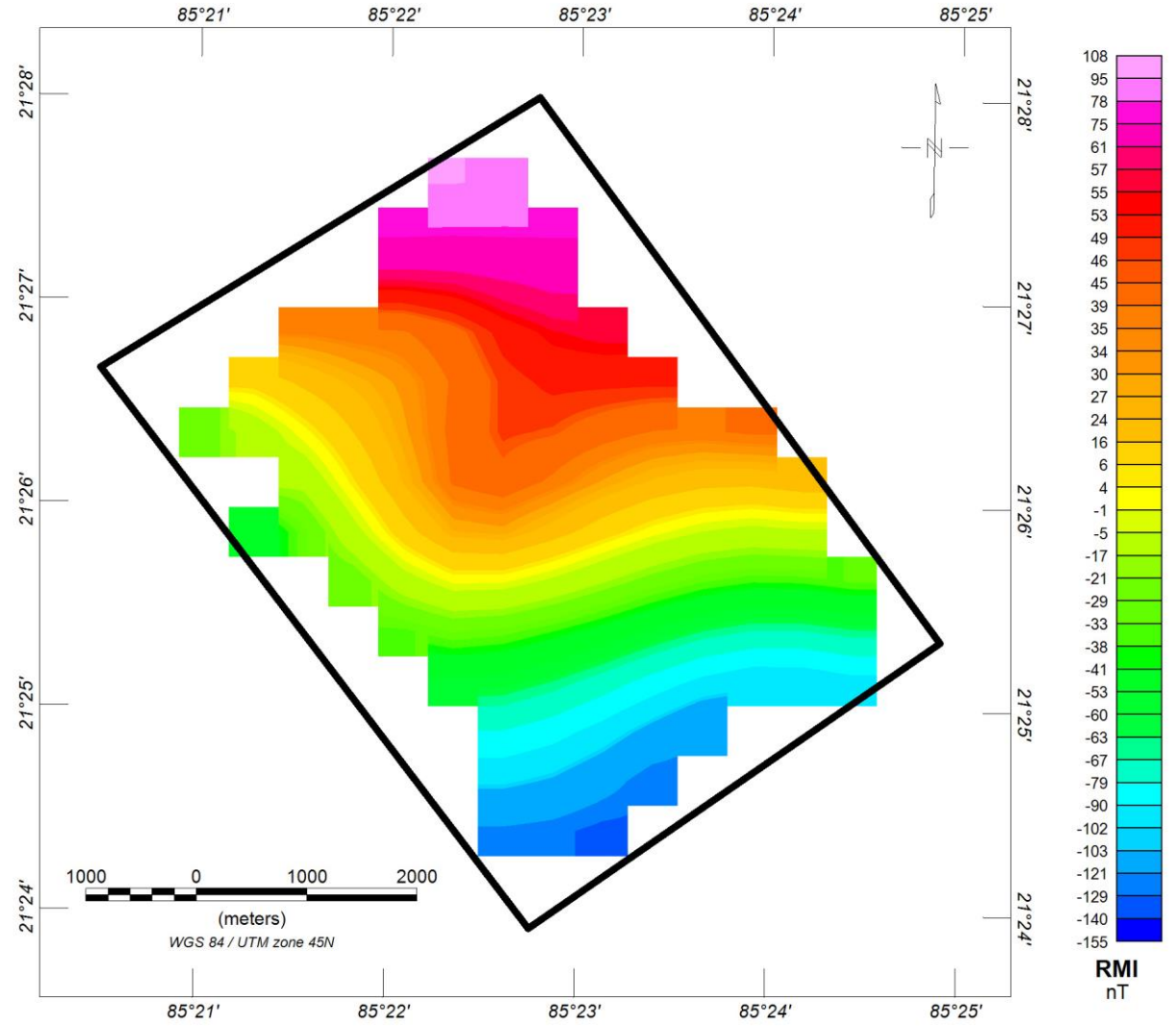


Plate 4 -Aeromagnetic map/s.

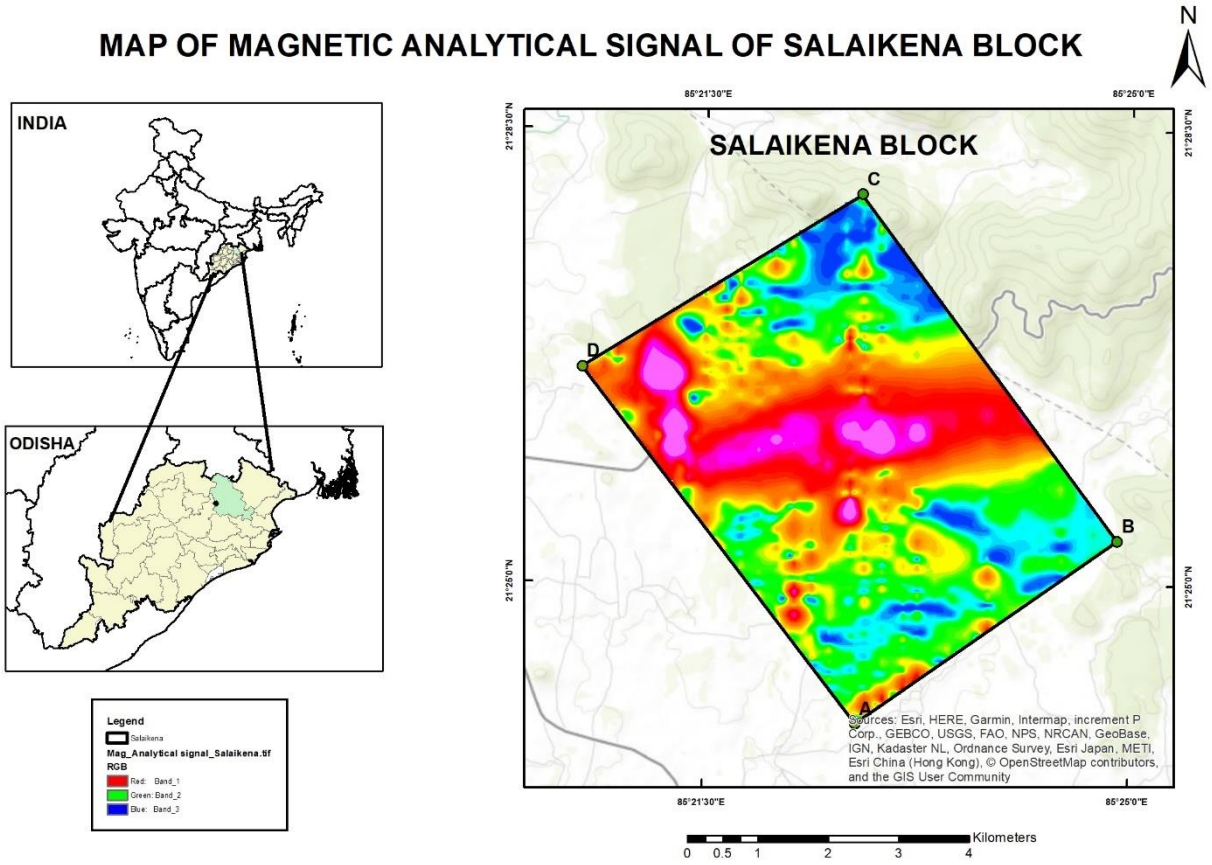
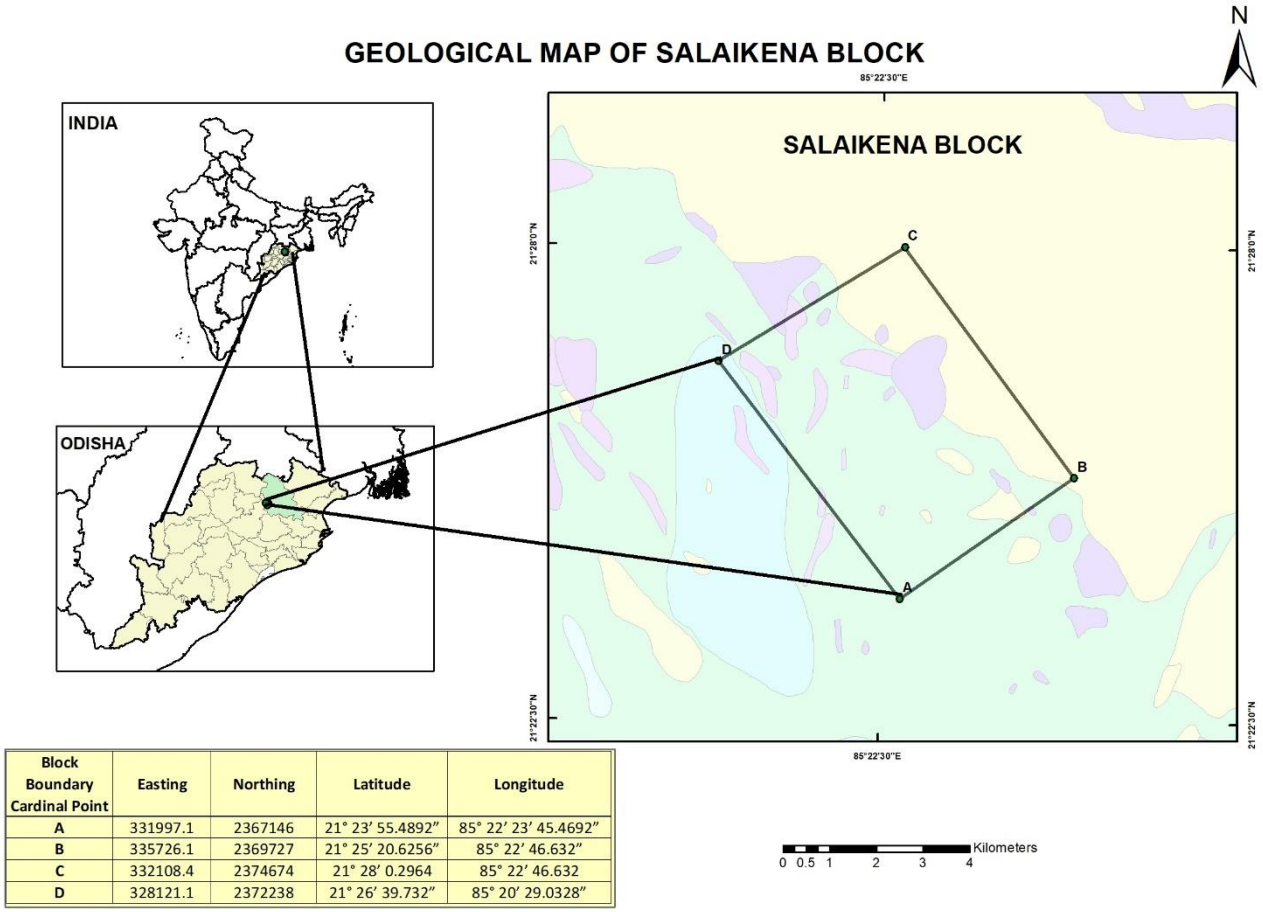


Plate 5: Proposed block boundary over Geological map.



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D	328121.1	2372238	21° 26′ 39.732″	85° 20′ 29.0328″

Plate 6: Proposed block boundary over Land use/ Accessibility map.
(Not required at this stage.)

Plate 7: Proposed block boundary over topographic map on 1:50,000.

Plate 8: Proposed Ground magnetic survey line within the block.