PROPOSAL FOR RECONNAISSANCE SURVEY (G-4 STAGE) FOR GOLD IN BARGUR BLOCK (117.50 SQ.KM AREA) BARGUR BELT OF KOLAR SCHIST BELT DISTRICT: KRISHNAGIRI. STATE: TAMIL NADU

COMMODITY: GOLD

BY

MINERAL EXPLORATION AND CONSULTANCY LIMITED

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SEMINARY HILLS. NAGPUR

PLACE: NAGPUR

DATE: 20.12.2023

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

	Features	Details
	Block ID	Bargur Block
	Exploration Agency	Mineral Exploration & Consultancy Limited (MECL)
	Commodity	Gold and associated minerals
	Mineral Belt	Barugur belt of Kolar Schist belt
	Completion period with entire Time schedule to complete the project	14 Months
	Objectives	The present exploration program at G4 stage has been formulated to fulfil the following objectives. i) To carry out Geological & Structural mapping on 1:12,500 scale for demarcation of Gold bearing formations (host rock) with the structural features to identify the surface manifestations and lateral disposition of the mineralized zones. ii) To collect surface (Bedrock/soil/stream sediment) samples & analyse for Gold & Silver and associated minerals to identify the host rock. iii) To carry out surface geophysical IP cum Resistivity, SP and Magnetic to demarcate potential areas for mineral targeting and giving sub-surface positive details of extension of concealed ore body iv) To carry out trenching/pitting work in the identified anomalous zones v) Based on the positive outcome of geological mapping, surface geochemical sample results, ground geophysical survey and trenching/pitting work scout drilling (500m in 5 Bhs) shall be carried out in the potential mineral bearing area to confirm the subsurface continuity of mineralisation. vi) To estimate Reconnaissance resource (334) for Gold along with accessory elements if any as per UNFC norms and Minerals (Evidence of Mineral Content) Rules-2015 at G-4 level.

	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	Work will be carried out by MECL
	Name/Number of Geoscientists	Two nos. Geoscientist (Field + HQ)
	Expected Field days (Geology, Geophysics, surveyor)	Geologist Party days:180 days
		Geophysicist Party days: 60 days
		Surveyor Party days:45 days

1.	**Location**	This area forms the northern part of Krishnagiri District of Tamil Nadu. The area is served by a good network of metalled roads. National Highway No.46 (Chennai-Bangalore road) passes through the southern end of the area. The area is well connected by Krishnagiri-Kuppam road on the west and Bargur-Gurivinayanapalli road on the east. There are also a number of foot-tracks connecting these roads. Bargur is the nearest Bus station and is just 1 km. from the south-eastern corner of the area. The nearest railway station by road is Jolarpettai junction which is about 35 km. from Bargur.
	Latitude and Longitude	Corner cardinal points of Bargur G4 Block (117.50 sq.km) is as below.
	Villages	Near village Sakalagunta, Bangaragunta, Kotur, Varattanapalli, Kottilattiuand Madepalli and Melpunkurutti
	Tehsil/Taluk	Krishnagiri
	District	Krishnagiri
	State	Tamil Nadu
2.	**Area (hectares/ square kilometres)**	
	Block Area	117.50 sq.km
	Forest Area	Block area covers Varatanapalli RF & part of Maharajagadi RF
	Government Land Area (Bilanam)	Data not available
	Charagaha	Data not available
	Private Land Area	Data not available
3.	**Accessibility**	
	Nearest Rail Head	Kuppam (20km), Patchur (15 km) &Jolarpet Junction (25km)

Sl. No.	Point	GCS-WGS1984 (DMS)	
		Latitude	Longitude
1	A	12°41'22.65" N	78°15'51.41" E
2	B	12°37'13.04" N	78°21'57.27" E
3	C	12°32'45.02" N	78°21'56.99" E
4	D	12°32'45.00" N	78°17'35.00" E
5	E	12°35'30.94" N	78°17'35.00" E
6	F	12°35'30.92" N	78°15'51.25" E

	Road	Well connected by NH and SH to major towns and cities.
	Airport	Bengaluru (143 km)
4.	**Hydrography**	
	Local Surface Drainage Pattern (Channels)	All the stream-lets are originating from the central hill (.746 hill) and diverging radially in the central part of the area. NW-SE trending ridges on the NW part of the block area (.785 hill) where drainage/stream lets originating from the peaks through valleys and flowing towards southeast direction.
	Rivers/ Streams	No major river exists in the area.
5.	**Climate**	
	Mean Annual Rainfall	Average annual rainfall is 80 cm.
	Temperatures (December) (Minimum) Temperatures (June) (Maximum)	The area experiences a comparatively dry tropical climate with a seasonal temperature variation from 17°C to 40°C. mainly during the south-west and the north-east monsoons from June to December.
6.	**Topography**	
	Toposheet Number	57 L/6
	Morphology of the Area	NW-SE trending ridges (.785 hill) of Maharajgadai RF on the NW part of the block area with valleys and Denudational/residual hills occupy the centre of the area surrounded by undulating terrain. The highest point in the hills is 746 m in the central part of block area. The drainage is generally controlled by structural features like foliation and joints.
7.	**Availability of baseline geoscience data**	
	Geological Map (1:50K/25K)	Regional geological map sourced from Bhukosh (1:50K) available. Detailed Geological map (1:2000 scale) of Sakalagunta (0.1 sq.km) of Bargur area is available (GSI, 1990)
	Geochemical Map	Not available.
	Geophysical Map (Aeromagnetic, ground geophysical, Regional as well as local scale GP maps)	Not available.
8.	**Justification for taking up Reconnaissance Survey/ Regional Exploration**	1. The proposed Bargur (G4) block area is part of Bargur belt and lies in the southern end of Kolar schist belt. The Bargur area is known for incidence of gold and two Ancient gold workings in Bargur area namely Sakalagunta and Bangaragunta were examined by M/s John Taylor & Sons in 1940s. 22 samples of soil collected from old dumps and shafts of Sakalagunta analysed 1.6 to 9.5 g/t gold. 15 out of 32 samples of soil and quartz collected from Bangaragunta analysed 1.5 g/t to 8 g/t gold (GSI, 1990, Records v (123 (5) p 169-183).

		2. During the F.S.1988-89, Gopalakrishnan of GSI carried out preliminary investigation for primary gold in Bargur area. The surface and trench samples from Bargur area shown the incidence of gold. Out of 35 surface samples collected, 16 samples analysed 0.1 to 0.9 g/t of gold and one quartz vein sample collected from the Bangaragunta old working dump analysed 12 g/t of gold. 3. Trenching work has established a 75m long auriferous mineralised zone trending in N15°-20°W-S15°-20°E direction. The width of the zone varies from 0.65 m. to 4.45 m with gold values ranging from 0.2 to 0.96 g/t. The mineralised rock is amphibolite with veins and veinlets of quartz and pegmatite veins. 4. Gopalakrishnan (1990) opined that "Further detailed work is recommended to trace the strike continuity of the zone. One grab sample from the Bangaragunta old working pit (?) dump assayed 12 g/t of gold. Few trenches may be opened to expose the mineralised quartz zone and to see the strike continuity of the Bangaragunta quartz zone. The assay data of surface grab samples of various rock types has clearly indicated that the amphibolite enclosures/ bands in migmatites are as extensively mineralised with gold as their counterparts in the Kolar Schist Belt. These enclaves should therefore be extensively prospected for gold". 5. In view of the above, the area hold potential for gold mineralisation and needs to be explored in detail with an integrated exploration approach at G4 stage to trace the further continuity of mineralisation in the extension areas and locate such possible ore bodies over a larger area (117.5 sq.km). The present G4 stage exploration will be helpful to figure out the exact potentiality of the prospect. 6. The positive outcome of the present exploration would be helpful and facilitate the Govt. for auctioning of the block.

PROPOSAL FOR RECONNAISANCE SURVEY (G-4 STAGE) FOR GOLD IN BARGUR BLOCK (117.50 SQ.KM AREA) BARGUR BELT OF KOLAR SCHIST BLET DISTRICT- KRISHNAGIRI, TAMIL NADU

1.0.0 BLOCK SUMMARY

1.1.0 Introduction

1.1.1 India ranked 6th in the world gold production in the year 1905, whereas, presently it produces gold from three mines namely Hutti, Uti, Hirabuddni of HGML in Karnataka and from one private mine in Prorjana Mine (Kundarkocha) in Jharkhand besides as by product from the copper mines of HCL.

1.1.2 Now the production of gold in India is a meagre one to two tonnes per annum only. But the fascination for the yellow metal in our country never dies; with the spiralling demand for the metal, makes more thrust for exploration in strategic mineral, Precious metal, PGE and Cobalt by Government of India.

1.1.3 During, preceding decades no large-scale metal deposit has been discovered in India. However, the possibility of working of small mineral bodies in proximity to each other, though technological advances and increased operational efficiency, cannot be ruled out. At the back drop of amendment of MMDR Act, 2015 by Government of India, an impetus is being given for funding, if not large deposits, but a cluster of small deposits occurring in close proximity to each other. Therefore, it is necessary and imperative to locate and explore such small deposits in clusters.

1.2.0 Background Information

1.2.1 The proposed Bargur block area is part of Bargur belt and lies in the southern end of Kolar Schist belt. Chigargunta Gold mine is away from Bargur by about 50km. Two ancient old workings for gold namely Sakalagunta and Bangaragunta in Bargur area located and reported incidence of gold in the area by the previous workers in the past.

1.2.4 During F.S.1988-89, GSI carried out preliminary investigation for primary gold in Bargur area Krishnagiri taluk, Dharmapuri district Tamil Nadu in part of Toposheet No.57 L/6. Geological mapping on 1:25,000

scale over 50 sq.km area and detailed geological mapping (plane-table mapping) on 1:2,000 scale, trenching and sampling were carried out over 0.1 sq.km area nearby old workings in the Bargur area. The trenching work has established a 75 m. long mineralised zone trending in N.15°-20°W-S15°-20°E direction. The width of the zone varies from 0.65 m to 4.45 m. and the gold values are ranging from 0.2 to 0.96 g/t of (weighted average) gold. The mineralised rock is amphibolite with very thin pegmatite veins. Further detailed work is recommended for tracing the strike continuity of the zone.

1.2.5 In light of the above, MECL is proposing to carry out Reconnaissance survey (G4) for Gold in Bargur area for tracing further strike continuity of mineralized zones and locate such ore bodies over a larger area (117.50 sq.km) in the proposed Barugur block of Krishnagiri District, Tamil Nadu.

1.2.6 In this connection, DGM, Govt. of Tamil Nadu given consent for carrying out Reconnaissance survey (G-4) for Gold in Bargur block, Dharmapuri/Krishnagir District, Tamil Nadu vide letter No.2804/MM11/2020 dated 08.11.2023.

1.3.0 Location and Accessibility

1.3.1 Bargur block falls in Toposheet No. 56 L/6. Kuppam is 20km away from the block. The nearest rail head is Kuppam (20Km), and Jolarpet Junction, which is 25 km. The nearest airport is Bengaluru (143 Km) from Bargur. **(Plate No.1).**

1.4.0 Physiography and Climate

1.4.1. NW-SE trending ridges (.785 hill) of Maharajgadai RF on the NW part of the block area with valleys and Denudational/residual hills occupy the centre of the area surrounded by undulating terrain. The highest point in the hills is 746 m in the central part of block area. The drainage is generally controlled by structural features like foliation and joints. The drainage is generally controlled by structural features like foliation and joints. All the stream-lets are originating from the central hill (.746 hill) and diverging radially in central part the block area. NW-SE trending ridges on the NW part of the block area (.785 hill) where drainage/stream lets originating from the peaks through valleys and flowing towards southeast direction.

1.4.2 The area experiences a comparatively dry tropical climate with a seasonal temperature variation from 17°C to 40°C. The average rainfall is 80 cms. Recorded mainly during the south-west and the north-east monsoons from June to December.

2.0.0. Regional Geology

2.0.1 The Bargur block area is part of Bargur belt and lies in the southern end of Kolar Schist Belt. The Bargur belt of Tamil Nadu represents the southern extension of the eastern tail of Kolar schist belt. Hornblende schist amphibolite occurs in the southern part of the Kolar schist belt where it has been designated as Bargur series (Gopalakrishnan et al., op.cit.). These are included in the Kolar Group of Subramanian and Selvan (op.cit.). The Bargur series (Formation) is made up of hornblende schist, amphibolite, banded iron formation and mica schist. The easternmost schist belt of Karnataka (Kolar schist belt) traced in a north - south direction extends at its southern end into the Dharampuri district of Tamil Nadu, where the belt splits up into two arms. Here, the rock types are the same as those of Kolar schist belt and include biotite and hornblende gneisses and amphibolites with banded ferruginous quartzite, quartzo-feldspathic gneiss and quartz-sericite schist. Banded Iron Formations consisting dominantly of quartz and iron oxides are significant components of the Bargur series. The common mineral constituents of the iron formation in amphibolite facies are quartz and magnetite with or without grunerite and cummingtonite. In granulite facies, the said mineral assemblage is added by hedenbergitic clinopyroxene, orthopyroxene and garnet. The iron formation represents a platformal environment of deposition (Naqvi and Rogers, op.cit.). Mafic granulites associated with the iron formations are meta-igneous as indicated by the composition of the constituent magnetites. The content of Cr, Ni, Mn, V and Ti is lower in the magnetites of the iron formations than the magnetites of the mafic granulites (Subba Reddy and Prasad, 1982).

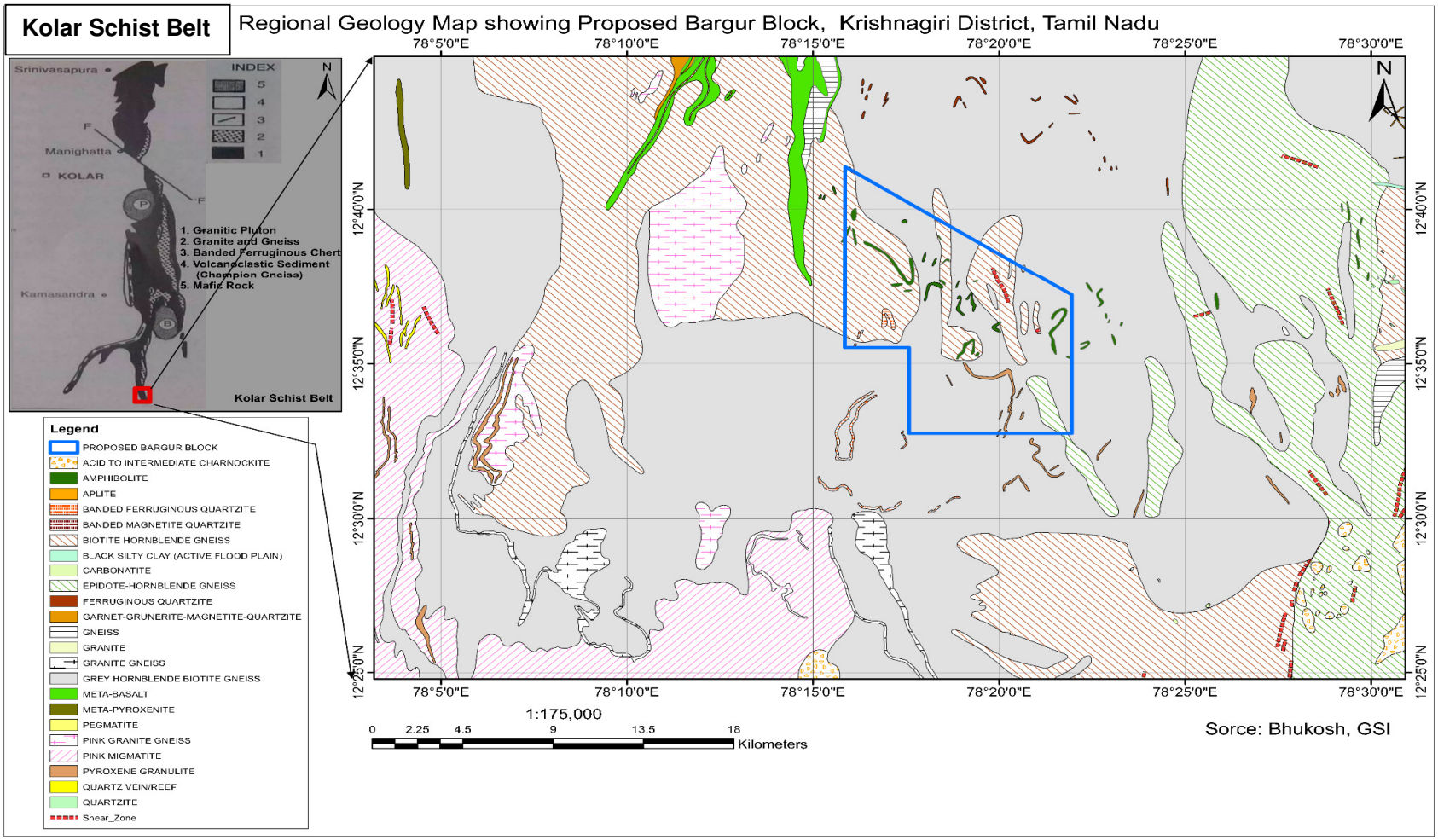
2.0.2 The generalized lithological succession of the area is given in the **Table I.A.** and location of the Bargur block area is shown **Fig. No.1.**

Table I.A
Lithological succession of the area (after GSI)

Age	Group	Litho-units
Archaean	Recent to Sub-recent	Soil/kankar
	Acid Intrusive	Quartz and Pegmatite veins
	Basic Intrusive	Dolerite Gabbro
	Peninsular Gneissic Complex	Migmatite Pyroxenite dyke
	Kolar Schist Belt	Amphibolite, Banded Iron Formation Meta-chert

2.1.0. Geology of the Block

1.2.1 The litho-units exposed in the area form a part of the Peninsular Gneissic Complex with lenses and enclaves of amphibolite and banded iron formation (in the form of ferruginous quartzite) and meta-chert of Kolar schist belt. The Peninsular Gneissic Complex is represented by migmatites which was earlier called as granite/gneiss/ granitoids. Migmatites form the major rock type of the area. The amphibolite and banded iron formations occur as enclaves within migmatite. The schist belt units are occurring as rafts within the migmatites. All these rock types are intruded by basic and ultrabasic dykes of dolerite/gabbro and pyroxenite composition and acid intrusive of Quartz and pegmatite veins. Two ancient/old workings for gold known as Sakalagunta and Bangaragunta located within Amphibolites in Bargur area. The description of rock types is give below. The geological map of the block area is given as **Plate No.III.**


Kolar Schist Belt
Regional Geology Map showing Proposed Bargur Block, Krishnagiri District, Tamil Nadu
Srinivasapura
Manighatta
KOLAR
Kamasandra
INDEX
5
4
3
2
1
1. Granitic Pluton
2. Granite and Gneiss
3. Banded Ferruginous Chert
4. Volcanoclastic Sediment (Champion Gneiss)
5. Mafic Rock
Kolar Schist Belt
N
78°5'0"E
78°10'0"E
78°15'0"E
78°20'0"E
78°25'0"E
78°30'0"E
12°40'0"N
12°35'0"N
12°30'0"N
12°25'0"N
Legend
PROPOSED BARGUR BLOCK
ACID TO INTERMEDIATE CHARNOCKITE
AMPHIBOLITE
APLITE
BANDED FERRUGINOUS QUARTZITE
BANDED MAGNETITE QUARTZITE
BIOTITE HORNBLENDE GNEISS
BLACK SILTY CLAY (ACTIVE FLOOD PLAIN)
CARBONATITE
EPIDOTE-HORNBLENDE GNEISS
FERRUGINOUS QUARTZITE
GARNET-GRUNERITE-MAGNETITE-QUARTZITE
GNEISS
GRANITE
GRANITE GNEISS
GREY HORNBLENDE BIOTITE GNEISS
META-BASALT
META-PYROXENITE
PEGMATITE
PINK GRANITE GNEISS
PINK MIGMATITE
PYROXENE GRANULITE
QUARTZ VEIN/REEF
QUARTZITE
Shear_Zone
1:175,000
0 2.25 4.5 9 13.5 18
Kilometers
Sorce: Bhukosh, GSI

1.3.2. **Banded Iron Formation:** Banded Iron Formation is represented by ferruginous quartzite and it occurs as lenses and bands trending parallel to the foliation trend of the country rock i.e, migmatite. The bands are tightly folded. The ferruginous quartzite at 1.5 km. NE of Varatanapalli (.607 hill) shows sulphur stains and disseminations of pyrite, chalcopyrite and arsenopyrite (?). Effects of silicification were also seen. In general, the banded iron formation is composed of quartz, magnetite, hematite and grunerite. The rock shows lateritic cappings on weathered surface at places.

1.3.3 **Amphibolite:** Enclaves of amphibolite in the form of lenses and bands are seen. The bands are tightly folded. The contact of amphibolite with the migmatite is sharp at many places. Three types of amphibolites are noticed, namely schistose, coarse-grained and tufted types. The schistose variety is common and the other two types are seen at a few places. In the Sakalagunta area all the three types are noticed.

1.3.4. **Migmatites:** The migmatites occupies the hills, knolls and hummocks, as well as plain. This unit was earlier called as granite gneiss/granitoid gneiss, hornblende-biotite gneiss, quartzo-felspathic gneiss and migmatite by the previous workers. In the areas of operation, the rock type exhibits typical migmatitic structures such as magmatic, and gneissic and folded structures at places.

1.3.5. **Basic Intrusive:** All the rock types of the area are intruded by basic dykes of gabbroic/doleritic composition. The gabbro dykes are generally trending in a WNW-ESE direction with swings to ENE-WSW. The dolerite dykes trend in a NNW-SSE direction and swing to NW-SE direction. Minor branching of the dykes is also noticed. The dykes are also showing variation from doleritic to gabbroic composition along the strike.

1.3.6 **Acid Intrusive:** Acid intrusives in the form of quartz and pegmatite veins are noticed in the area. These veins appear to be fracture fillings as well as along the foliation planes. In the Sakalagunta area, the pegmatite veins are seen cutting at an acute angle to the foliation of the migmatite.

2.2.0 Structure

2.2.1. The general trend of foliation of the rock types varies from N-S to NNE-SSW direction with moderate to steep dips on either side. Number of minor folds are noticed in the area. The tight isoclinal folds with the fold axis trending along N-S to NNE-SSW directions exhibited by amphibolite and banded iron formation may represent the earliest (F-1) fold activity in the area. These earliest folds are co-axial with the trend of foliation of the rock types. The amphibolite and banded iron formation also exhibit plunging open folds with fold axis trending along NNE-SSW to NE-SW direction. The plunge amount varies from 20° to 40° towards NE or SW. Joints are seen in all the rock types. Totally three sets of joints are noticed trending along N-S to NNE-SSW, ENE-WSW and NW-SE directions and the dip varies from 80° on either side to vertical.

2.3.0. Mineralisation

2.3.1 The Sakalagunta and the nearby Bangaragunta old workings for gold are associated with vein quartz in hornblende gneiss/ amphibolite enclaves in migmatites. These occurrences are in the southward continuity of the Kuppam arm of the famous Kolar Schist Belt. In the Kolar Schist Belt the main hosts of vein quartz with gold mineralisation are meta-basalts (amphibolite). The hornblende gneiss/amphibolite enclaves/rafts in the migmatite (granite-gneiss) country adjacent to the schist belt, are considered to be the high grade metamorphosed equivalents of the meta-basalts of the schist belt. These enclaves might also be as favourable as their parent rocks for gold mineralisation, as evidenced by the two known old workings in them, i.e, Sakalagunta and Bangaragunta (Gopalakrishnan, 1990).

2.3.2 Sakalgunta old working is located on a southerly plunging antiform of amphibolite and the Bangaragunta is located at 0.5 km WSW of Karakuppam within amphibolite enclave. Metachert enclave with

suphides was noticed at 1.3 km southwest of Chintagapalli. Sulphides identified are pyrite, chalcopyrite and arsenopyrite.

2.4.0 Mineral Potentiality based on geology, geophysics, ground geochemistry etc.

2.4.1 Ancient gold workings in Bargur area namely Sakalagunta and Bangaragunta were examined by M/s John Taylor & Sons in nineteen forties. 22 samples of soil collected from old dumps and shafts of Sakalagunta analysed 1.6 to 9.5 g/t gold. 15 out of 32 samples of soil and quartz collected from Bangaragunta analysed 1.5 g/t to 8 g/t gold (GSI, 1990, Records v (123 (5) p 169-183.

2.4.2. During the F.S.1988-89, Gopalakrishnan of GSI carried out preliminary investigation for primary gold in Bargur area and located Sakalagunta and Bangaragunta old workings in Bargur area. The surface and trench samples from Bargur area show the incidence of gold out of 35 surface samples collected, 18 samples analysed less than 0.1 g/t of gold, 16 samples analysed 0.1 to 0.9 g/t of gold and one quartz vein sample collected from the Bangaragunta old working dump analysed 12 g/t of gold. The analytical result of different rock types are given below Table I.B.

Table I.B
Analytical results of different rock types-Bargur area

Sr.No.	Rock type	No. of samples collected	Gold Values
1	BIF	8	<0.1 g/t (6 samples)
			0.1g/t (2 samples)
2	Qtz vein in Amphibolite	17	<0.1 g/t (7 samples)
			0.1 to 0.9 g/t (10 samples)
3	Amphibolite	8	<0.1 g/t (5 samples)
			0.1 g/t (3 samples)
4	1. Qtz vein from Bangaragunta old working dump	1	12.0 g/t
	2. Amphibolite with qtz vein from Bangaragunta old working dump	1	0.2 g/t

2.4.3. The above data clearly shows that the amphibolite enclaves in the migmatites are as widely and extending auriferous as the metabasalts of the schist belt.

2.4.4 Panning of old working dump material as well as the trench dumps in the Sakalagunta area showed the incidence of gold in the form of fine specs. The analytical results of trench groove (opened in the Sakalagunta area) samples established a N50°-S0°W - S15°-S0°E trending mineralised zone of 75 m. long and roughly along the axial zone of the antiformal fold. The highlights of the trench values are shown in the following **Table No.I.C**.

Table I.C
Highlights of Trench samples-Bargur area

Trench No.	Lithology	Weighted avg. of gold
T-1	Amphibolite with thin pegmatite veins	0.287 g/t over 4.25 m.
T-2	Amphibolite with thin pegmatite veins	0.7276 g/t over 4.45 m.
T-3	Amphibolite and pegmatite	0.96 g/t over 2.6 m
T-6	Amphibolite and quartz vein	0.2 g/t over 0.65 m.

2.4.5 Trenching work in the area revealed that Auriferous mineralized zone traced about 75m strike length and the width of the zone varies from 0.65 m. to 4.45 m. and the gold values (weighted average) are ranging from 0.2 to 0.96 g/t. The mineralised rock is amphibolite with veins and veinlets of quartz and pegmatite veins.

2.4.6 Gopalakrishnan (1990), recommended that “Further detailed work is recommended to trace the strike continuity of the zone. One grab sample from the Bangaragunta old working pit (?) dump assayed 12 g/t of gold. Few trenches may be opened to expose the mineralised quartz zone and to see the strike continuity of the Bangaragunta quartz zone. The assay data of surface grab samples of various rock types has clearly indicated that the amphibolite enclosures/ bands in migmatites are as extensively mineralised with gold as their counterparts in the

Kolar Schist Belt. These enclaves should therefore be extensively prospected for gold".

3.1.0. Previous Work

3.1.1 Boseworth Smith (1889) was the first worker to mention the extension of hornblende schist bands of Kolar Schist Belt with which gold bearing lodes are associated towards Maharaja-gadai and Adakonta as two arms branching out from Mallappakonda. Krishnaswamy (1950) described amphibolite, quartzite, banded ferruginous quartzite, granite and champion gneiss in the area. Iyengar and Gopal Rao (1957) mapped the area and reported charnockite, gneissic granite, amphibolite, hornblende schist and basic dykes. The Tamil Nadu State Geology branch under the UNDP (Ford et al., 1975) carried out regional geochemical orientation surveys and large-scale mapping of the southern extension of Kolar Schist Belt. Detailed sampling of amphibolite and quartzite for gold was carried out by them in the area north of Varatanapalli and Veppanapalli, but it failed to yield any encouraging result. Shrivastava (1983) carried out geological mapping in the area and few samples from vein quartz, amphibolite, sheared amphibolite and ferruginous quartzite have shown the incidence of gold values ranging from 0.1 to 0.7 g/t of gold. Gopalakrishnan (1984) collected regional groove and chip samples from ferruginous quartzite and the samples have yielded low gold values ranging from 0.2 to 0.4 g/t of gold.

3.1.2 Gopalakrishnan (1989) undertaken large scale geological mapping (1:25,000) over 50 sq.km area and Detailed mapping (plane-table mapping) on 1:2,000 scale, trenching and sampling was carried out over 0.1 sq.km area in the Bargur area. Nine trenches (112 cu.m) were opened to expose the mineralised zone of the Sakalagunta old working. The trenching work has established a 75 m. long mineralised zone trending in N15°-20°W-S15°-20°E direction. The width of the zone varies from 0.65 m to 4.45 m. and the gold values observed are ranging from 0.2 to 0.96 g/t of (weighted average) gold. The mineralised rock is amphibolite with very thin pegmatite veins. He

recommended further detailed work for tracing the strike continuity of the zone.

3.2.0. Observation and Recommendations of previous work

3.2.1 Gopalakrishnan (1990), recommended that “Further detailed work is recommended to trace the strike continuity of the zone. One grab sample from the Bangaragunta old working pit (?) dump assayed 12 g/t of gold. Few trenches may be opened to expose the mineralised quartz zone and to see the strike continuity of the Bangaragunta quartz zone. The assay data of surface grab samples of various rock types has clearly indicated that the amphibolite enclosures/ bands in migmatites are as extensively mineralised with gold as their counterparts in the Kolar Schist Belt. These enclaves should therefore be extensively prospected for gold”.

3.2.2 In light of the above, the area hold potential for gold mineralisation and needs to be explored in detail with an integrated exploration approach at G4 stage to trace the further strike continuity of mineralisation and locate such ore bodies over a larger area. The present exploration will be helpful to figure out the exact potentiality of the prospect in the proposed Bargur block area.

3.3.0. Scope of Proposed Exploration

3.3.1 The Reconnaissance Survey at G-4 stage comprises, large scale geological mapping (1:12,500 scale) with surface geochemical sampling (bedrock/channel/soil/stream sediment), Ground Geophysical survey, trenching/pitting scout drilling and associated survey, chemical analysis and physical analysis and Report preparation.

3.4.0 Objectives of Present Exploration

The present exploration program at G4 stage has been formulated to fulfil the following objectives.

i) To carry out Geological & Structural mapping on 1:12,500 scale for demarcation of Gold bearing formations (host rock) with the structural features to identify the surface manifestations and lateral disposition of the mineralized zones.

ii) To collect surface (Bedrock/channel/soil/stream sediment) samples & analyse for Gold & Silver and associated minerals to identify the host rock.

iii) To carry out surface geophysical IP cum Resistivity, SP and Magnetic to demarcate potential areas for mineral targeting and giving sub-surface positive details of extension of concealed ore body

iv) To carry out trenching/pitting work in the identified anomalous zones

v) Based on the positive outcome of geological mapping, surface geochemical sample results, ground geophysical survey and trenching/pitting work scout drilling (500m in 5 Bhs) shall be carried out in the potential mineral bearing area to confirm the subsurface continuity of mineralisation.

vi) To estimate Reconnaissance resource (334) for Gold along with accessory elements if any as per UNFC norms and Minerals (Evidence of Mineral Content) Rules-2015 at G-4 level.

3.5.0. Block description

3.5.1 The Bargur Block area falls in Survey of India Toposheet No. 56L/6 and covers an area of 117.50 sq.km in and around villages Sakalagunta, Bangaragunta, Kotur, Varattanapalli, Kottilattiu and Madepalli and Melpunkurutti of Krishnagiri District, State Tamil Nadu. The block location in toposheet is given in **Plate No.I.** The Co-ordinates of the corner points of the block area are given in **Table No.-III.A.**

Table-III.A: Co-ordinates of the corner points of the Bargur Block

Sl. No.	Point	GCS-WGS1984 (DMS)		UTM (m)	
		Latitude	Longitude	Northing	Easting
1	A	12°41'22.65" N	78°15'51.41" E	1404371.96	202867.71
2	B	12°37'13.04" N	78°21'57.27" E	1396583.52	213835.62
3	C	12°32'45.02" N	78°21'56.99" E	1388342.60	213744.65
4	D	12°32'45.00" N	78°17'35.00" E	1388422.31	205830.87
5	E	12°35'30.94" N	78°17'35.00" E	1393524.74	205883.37
6	F	12°35'30.92" N	78°15'51.25" E	1393556.74	202750.01

4.0.0 Planned Methodology

4.1.1 In accordance to the objective set for the block, the exploration programme is proposed. The Exploration shall be carried out as per Minerals (Evidence of Mineral Contents) Rule-2015. Accordingly, the following scheme of exploration is formulated in order to achieve the objectives. The details of different activities to be carried out are presented in subsequent paragraphs.

4.2.0. Geological Mapping

4.2.1. Large scale Geological mapping on 1:12,500 scale shall be carried out in the entire block area of 117.50 sq.km area. Rock types, their contact, structural features will be mapped. Surface manifestations of the ore bodies available along with their surface disposition will be marked on the map. Surface (bedrock/soil/stream sediment) samples shall be collected from the area for analysis of Gold (Au) and Silver (Ag) by fire assay method. Few selected samples shall be analysed for their Ni, Co, Cr, Cu, Pb, Zn, V, Ti and PGE contents.

4.3.0. Geochemical Sampling

4.3.1. Surface sampling (Bed Rock/Soil/Stream sediment):

4.3.2 During the course of Geological mapping the Bed rock/channel samples shall be collected from the outcrops along with soil and stream sediment samples. A total 200 Nos of surface geochemical samples (Bedrock/soil/stream sediment) shall be analysed for Au & Ag by fire assay method. Total 50 Nos selected samples shall be analysed for Ni, Co, Cr, Cu, Pb, Zn, V, Ti and PGE contents.

4.4.0 Check sampling:

4.4.1 In order to compare the analytical results of primary samples and to check any analytical bias total 10% of external check samples shall be analysed at NABL accredited laboratory. A total 20 Nos of external check geochemical samples (bedrock/soil/stream sediment) shall be analysed for assay of Au & Ag by fire assay method. Total 05 Nos external Check samples shall be analysed for Ni, Co, Cr, Cu, Pb, Zn, V, Ti and PGE.

4.5.0 Surveying:

4.5.1. DGPS and total station survey instruments shall be utilized for survey work in the block area. Survey party will be associated with geophysical survey team to fix the survey stations and profiles and plotting its location on map for proper interpretation of the survey data. During scout drilling, borehole fixation and determination of reduced level and co-ordinates of the boreholes will be undertaken.

4.5.0. Geophysical Survey:

4.5.1. In general, the area is plain land occupied by hills i.e. north-south striking ridges and surrounded by plain lands. Isolated hillocks and some undulations are seen at places. The area is covered with vegetation and shrubs and most of the plain land is under agriculture. In view of presence of vegetation and soil cover the need of the ground

Geophysical survey is felt to uncover the concealed extension of mineralized bodies if any in the area. On interpretation of data of geological mapping, geochemical sampling, if required surface geophysical survey will be carried out to assess the continuity of surface manifestations of mineralized zones in strike and dip direction.

4.5.2 In present exploration, Integrated ground geophysical survey shall be carried out to delineate potential mineralized zone in the area. Induced Polarization (I.P.) cum Resistivity, S.P & Magnetic Survey shall be carried out in the identified potential area at tentatively at 200m traverse/profile interval and 20m station interval tentatively involving cumulative 30 Lkm.

4.6.0. Exploratory Mining (Trenching/Pitting)

4.6.1. Shallow trenching (Excavation) shall be carried out in the potential zones/anomaly zones identified based on the results of Geological mapping, surface sampling and ground geophysical survey. A provision of shallow trenching of 200 cubic meter is kept. Trenching/pitting shall be done for correlation of mineralized zones (if any) on surface up to a depth of 2m after removal of soil/weathered column in the area. Locations of trenches on ground will be decided by field geologist based on field observations. A provision of 150 Nos of primary trench samples is kept for Au & Ag by fire assay method and 15 nos of external check (10%) samples shall be analysed for Au & Ag in external laboratory. Total 50 Nos of trench primary samples and 10% of external check samples shall be analysed for Ni, Co, Cr, Cu, Pb, Zn, V, Ti & PGE.

4.6.2. The trench /pit walls will be mapped on 1:200 scale.

4.6.3. Thus, a total of 200 cu m of shallow trenching/pitting work along with associated geological & laboratory studies shall be carried out in the area.

4.7.0. Core Drilling:

4.7.1. Based on the positive outcome of geological mapping, surface geochemical sample results, ground geophysical survey and trenching/pitting work, scout drilling (500m in 5 boreholes) shall be taken up in the identified potential mineral bearing area to confirm the subsurface continuity of mineralisation. The borehole shall be planned to intersect the ore body for 1st level intersections (60m vertical depth) and depth of each borehole shall be 100m.

4.7.2 Borehole deviation survey by multi-shot camera shall be carried out for all 5 No.s scout boreholes (500m)

4.7.3 Borehole geophysical logging shall be carried out for all 5 nos. scout boreholes (500m).

4.8.0. Drill Core Logging:

4.8.1. The drill core will be logged for rock types, structural features, textures, intersection of ore zones, types of mineralization and occurrence of various ore minerals. The logging for determination of Rock quality determination (RQD) will also be undertaken.

4.9.0. Drill Core Sampling:

4.9.1. During geological logging of drill core, mineralized zone will be marked on the basis of concentration of mineralisation and lithology. The primary sample length shall be maximum for 0.50m and sample length may vary due to variation in mineralisation and lithology, recovery factor etc. Total 150 Nos of primary and 15 Nos. of external check (10%) samples shall be analysed for Au & Ag by fire assay method. Total 50 Nos. of primary and 5 Nos. of external check 910%) samples shall be analysed for Ni, Co, Cr, Cu, Pb, Zn, V, Ti & PGE.

4.10.0 Whole Rock Analysis:

4.10.1 Whole Rock analysis for SiO_2, Al_2O_3, Fe_2O_3, TiO_2, MnO, CaO, Na_2O, K_2O+H_2O, MgO, P_2O_5, CO_2, & S radicals will be carried out on 10 Nos

samples to check the rock types, their variation in chemical composition.

4.11.0 Petrological & Mineralogical Studies:

4.11.1 During the course of Geological mapping and core logging total 10 samples from various lithounits from surface and boreholes will be studied for petrography studies. Total 10 samples collected from mineralized zones will be studies for ore mineral assemblages and their distribution, alteration, enrichment etc in polished sections.

4.12.0 Specific gravity determination:

4.12.1 Total 10 nos. drill core samples shall be subjected for specific gravity determination.

4.13.0 Composite Samples:

4.13.1 Total 10 Nos of composite samples (Borehole) shall be analysed for 34 elements analysis by ICP-MS method. Total 10 nos. composite samples collected from mineralized zones shall be analysed for Au & Ag by fire assay method.

5.0.0 Proposed quantum of work

5.0.1. Details of the particular, Quantum and the targets are tabulated in **Table No.-V.A.**

Table No-V. A
Envisaged Quantum of proposed work in Bargur Block (G4)

S. No.	Item of Work	Unit	Target
A	**Geological Mapping Other Geological Work & Surveying**		
	Geological mapping, (1:12,500 scale) & Trenching , drilling work	sq.km	117.50 sq.km
B	**Ground Geophysical Survey**		
	IP. Induced Polarization (I.P) cum Resistivity S.P and Magnetic	Line Km	30 Lkm
C	**Survey work for geophysical survey layout & Trenching work**		
	BH fixation & RL determination	Per Point of observation	5
D	**Trenching/Pitting**		
	a) Excavation of Trenches	cu.m	200
E	**DRILLING**		
	Drilling up to 300m (Hard Rock)	m	500
	Borehole deviation Survey by Multishot Camera	m	500
	Construction of concrete Pillar (12"x12"x30")	Nos.	5
	Drill Core Preservation	per m	160
F	**Borehole Geophysical Logging**	m	500
G	**LABORATORY STUDIES**		
1	**Chemical Analysis**		
i)	**Geochemical Sampling-Surface samples (Bedrock/Channel /Soil/Stream sediment) (Primary+10% External)**		
	a. Au & Ag by Fire Assay	Nos	220
	b. For Ni, Co, Cr, Cu, Pb, Zn, V, Ti	Nos	55
	c. For PGE	Nos	55
iii)	**Trench Samples**		
	Trench samples (Primary+10% External)		
	a) For Au & Ag by Fire Assay	Nos	165
	b. For Ni, Co, Cr, Cu, Pb, Zn, V, Ti	Nos	55
	c. For PGE	Nos	55
v)	**BH Core samples (Primary+ 10%External)**		
	a) For Au & Ag by Fire Assay	Nos	165
	b. For Ni, Co, Cr, Cu, Pb, Zn, V, Ti	Nos	55
	c. For PGE	Nos	55
vii)	**Composite Samples**		
	a. For Au & Ag by fire assay	Nos	10
	b. 34 Elements by ICPMS	Nos	10
2	**Physical & Petrological Studies**		
i	Petrological studies	Nos	10
ii	Mineralogical studies	Nos	10
vi	Whole Rock Analysis	Nos	10
vii	Sp. Gravity Determination	Nos	5
H	**Geological Report**	No.	1

6.0.0 Manpower Deployment

6.0.1 Manpower deployment List may be provided later.

7.0.0 Cost estimate

7.0.1. Cost has been estimated based on actual schedule of rates mandated in the circular OM No. 61/1/2018/NMET dated 31st March 2020 for promotional projects of MOM. The total estimated cost is **Rs. 286.09 Lakhs** with a timeline of 14 months. The summary of cost estimates for Reconnaissance Survey (G4 stage) is given in **Table No.-VII.A** and details of cost estimates is given in **Table No. –VII.B.** Tentative Time schedule/action plan for proposed Reconnaissance Survey (G4) for is given in **Table No. VII-C.**

Table No-VII.A: Summary of Cost Estimates (G4 stage)

Sl. No.	Item	Total
A	Geological Work	3555360
B	Geophysical Survey	5336559
C	Survey work	560220
D	Pitting & Trenching	666000
E	Drilling	7125900
F	Borehole Geophysical logging	311125
G	Laboratory Studies	5449920
	Sub total	23005084
H	Report	750000
I	Peer Review	30,000
J	Proposal Preparation	460,102
	Total	24245186
K	GST (18%)	4,364,133
Total cost including 18% GST		28,609,319
SAY, in Lakhs		**286.09**

Table No-VII.B

Table No.VII.B

Cost Estimates for Reconnaissance Survey (G4) for Gold in Bargur block, District: Krishnagiri. Tamil Nadu. [Block area- 117.50 sq. km; Nos. of Borehole- 5; Borehole depth range- upto 100m; Schedule timeline- 14 months]

S. No.	Item of Work	Unit	Rates as per NMET SoC 2020-21		Estimated Cost of the Proposal		Remarks
			SoC-Item -Sl No.	Rates as per SoC	Qty.	Total Amount (Rs)	
A	**Geological Mapping Other Geological Work & Surveying**						
	Geological mapping, (1:12,500 scale) & Trenching , drilling work	140 sq.km					
i	a. Charges for Geologist per day (Field) for geological mapping & trenching work, drilling work	day	1.2	11,000	180	1,980,000	
ii	b. Labours Charges; Base rate	day	5.7	504	360	181,440	Amount will be reimburse as per the notified rates for unskilled labor by the Central Labour Commissioner or respective State Govt. whichever is higher
	c. Charges for Geologist per day (HQ)	day	1.3	9,000	60	540,000	
	d. Charges for one Sampler per day (1 Party)	one sampler per day	1.5.2	5,100	120	612000	
	e. Labours (4 Nos)	day	5.7	504	480	241920	Amount will be reimburse as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher
	Sub Total- A					**3,555,360**	
B	**Ground Geophysical Survey**						
1	IP. Induced Polarization (I.P) cum Resistivity S.P and Magnetic (30 Lkm)	Per Line Km	3.4b	1,448,693	3	4,346,079	(8 -10 line Km=14,48,693/-) (30LKm cummulative)
3	Geophysicist party days (Field)	per day	3.18	11,000	60	660,000	
4	c. Labours Charges	day	5.7	504	120	60480	Amount will be reimburse as per the notified rates for unskilled labor by the Central Labour Commissioner or respective State Govt. whichever is higher
5	Geophysicist party days (HQ)	per day	3.18	9,000	30	270,000	
	Sub Total- B					**5,336,559**	
C	**Survey work for geophysical survey layout & BH**						
a	DGPS Survey for BH fixation & RL determination	Per Point of observation	1.6.2	19,200	5	96000	5 Bhs
b	Charges of Surveyor (1 party) for Geophysical survey layout work & Block boundary demarcation	one surveyor per day	1.6.1a	8,300	45	373500	
c	Labours Charges for survey work;	day	5.7	504	180	90720	Amount will be reimburse as per the notified rates for unskilled labor by the Central Labour Commissioner or respective State Govt. whichever is higher
	Sub-Total C					**560,220**	
D	**Trenching/Pitting**						
	a) Excavation of Trenches	per cu.m	2.1.1.	3,330	200	**666000**	
E	**DRILLING**						
1	Drilling up to 300m (Hard Rock)	m	2.2.1.4a	11,500	500	5,750,000	
2	Borehole deviation Survey by Multishot Camera	m	2.2.6	330	500	165,000	
3	Land / Crop Compansation (in case the BH falls in agricultural Land)	per BH	5.6	20,000	5	100,000	Amount will be reimburse as per actuals or max. Rs. 20000 per BH with certification from local authorities
4	Construction of concrete Pillar (12"x12"x30")	per borehole	2.2.7a	2,000	5	10,000	
5	Transportation of Drill Rig & Truck associated per drill (2 rigs)	Km	2.2.8	36	2,400	86,400	1200 km to & fro from Nagpur/ Rig
6	Monthly Accomodation Charges for drilling Camp (up to 2 Rigs)	month	2.2.9	50,000	3	150,000	
7	Drilling Camp Setting Cost	Nos	2.2.9a	250,000	1	250,000	
8	Drilling Camp Winding up Cost	Nos	2.2.9b	250,000	1	250,000	
9	Road Making (Flat Terrain)	Km	2.2.10a	22,020	5	110,100	Road Making will be considered as per the requirement and Road Making Charges will be reimbursed for max. 5 km.
10	Drill Core Preservation	per m	5.3	1,590	160	254,400	
	Sub Total E					**7,125,900**	
F	**Borehole Geophysical Logging**	5 Bhs of 350m each	3.12	622.25	500	**311,125**	Base Rate Rs.10, 88, 941/1750=622.25per m
G	**LABORATORY STUDIES**						
1	**Chemical Analysis**						
i)	**Geochemical Sampling-Surface samples (Bedrock/Channel /Soil/Stream sediment)**						
	a. Au & Ag by Fire Assay	Nos	4.1.5a (Base rate 2380)	4,760	200	952,000	
	b. For Ni, Co, Cr, Cu, Pb, Zn, V, Ti	Nos	4.1.7a & 4.1.7b	3,511	50	175,550	Rs.2506 for 5 radicals & Rs 335 for each subsequent radical
	c. For PGE	Nos	4.1.5d	11,800	50	590,000	
ii)	**Surface Check samples (10% External)**						
	b) For Au & Ag by Fire Assay	Nos	4.1.5a (Base rate 2380)	4,760	20	95,200	
	b. For Ni, Co, Cr, Cu, Pb, Zn, V, Ti	Nos	4.1.7a & 4.1.7b	3,511	5	17,555	
	c. For PGE	Nos	4.1.5d	11,800	5	59,000	
iii)	**Trench & Check Samples from**						
	Trench samples						
	a) For Au & Ag by Fire Assay	Nos	4.1.5a (Base rate 2380)	4,760	150	714,000	
	b. For Ni, Co, Cr, Cu, Pb, Zn, V, Ti	Nos	4.1.7a & 4.1.7b	3,511	50	175,550	Rs.2506 for 5 radicals & Rs 335 for each subsequent radical
	c. For PGE	Nos	4.1.5d	11,800	50	590,000	
iv)	**Trench Check samples (10% External)**						
	a) For Au & Ag by Fire Assay	Nos	4.1.5a (Base rate 2380)	4,760	15	71,400	
	b. For Ni, Co, Cr, Cu, Pb, Zn, V, Ti	Nos	4.1.7a & 4.1.7b	3,511	5	17,555	
	c. For PGE	Nos	4.1.5d	11,800	5	59,000	
v)	**BH Core samples**						
	a) For Au & Ag by Fire Assay	Nos	4.1.5a (Base rate 2380)	4,760	150	714,000	
	b. For Ni, Co, Cr, Cu, Pb, Zn, V, Ti	Nos	4.1.7a & 4.1.7b	3,511	50	175,550	Rs.2506 for 5 radicals & Rs 335 for each subsequent radical
	c. For PGE	Nos	4.1.5d	11,800	50	590,000	
vi)	**BH Core samples (10%External)**						
	a) For Au & Ag by Fire Assay	Nos	4.1.5a	4,760	15	71,400	
	b. For Ni, Co, Cr, Cu, Pb, Zn, V, Ti	Nos	4.1.7a & 4.1.7b	3,511	5	17,555	
	c. For PGE	Nos	4.1.5d	11,800	5	59,000	
vii)	**Composite Samples**						
	a. For Au & Ag by fire assay	Nos	4.1.5a (Base rate 2380)	4,760	10	47,600	
	b. 34 Elements by ICPMS	Nos	4.1.14	7,731	10	77,310	
2	**Physical & Petrological Studies**						
i	Preparation of thin section	Nos	4.3.1	2,353	10	23,530	
ii	Study of thin section	Nos	4.3.4	4,232	10	42,320	
iii	Preparation of polish section	Nos	4.3.2	1,549	10	15,490	
iv	study of polished section	Nos	4.3.4	4,232	10	42,320	
v	Digital Photographs	Nos	4.3.7	280	10	2,800	
vi	Whole Rock Analysis	Nos	4.1.15a	4,621	10	46,210	Rs.4200 for major oxides,421/- for each additonal trace element
vii	Sp. Gravity	Nos	4.8.1	1,605	5	8,025	
						5,449,920	
H	**Total A to H**					**23,005,084**	
I	**Geological Report Preparation**	**5 Hard copies with a soft copy**	**5.2**	Exploration cost exceeding 150 lakh but less than 300 lakh: A Minimum of ₹7.5 lakh or 3% of the work whichever is more		**750,000**	Reimbursement will be made after submission of the final Geological Report in Hard Copies (5 Nos) and the soft copy to NMET.
J	**Peer review Charges**		**As per EC decision**			**30,000**	
K	**Preparation of Exploration Proposal (5 Hard copies with a soft copy)**	**5 Hard copies with a soft copy**	**5.1**	2% of the Cost or Rs. 5.0 Lakhs whichever is less		**460,102**	EA will be reimbursed after submission of the Hard Copies and the soft copy of the final proposal along with Maps and Plan as suggested by the TCC-NMET in its meeting while clearing the proposal.
L	**Total Estimated Cost without GST**					**24,245,186**	
M	**Provision for GST (18% of J)**					**4,364,133**	GST will be reimburse as per actual and as per notified prescribed rate
N	**Total Estimated Cost with GST**					**28,609,319**	
				or Say Rs. In Lakhs		**286.09**	
Note:							
1	If any part of the project is outsourced, the amount will be reimbursed as per the Paragraph 3 of NMET SoC and Item no. 6 of NMET SoC. In case of execusion of the project by NEA on its own, a Certifiate regarding non outsourcing of any component/project is required.						

Table No-VII.C

Schedule timeline for Reconnaissance Survey (G4) for Gold in Bargur Block, District: Krishnagiri, Tamil Nadu																	
S. No.			**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**		**9**	**10**	**11**	**12**	**13**	**14**
1	Camp Setting	**Months/Days**															
2	Geological Mapping & Sampling	**days**															
3	Geophysical survey	**L.km**															
4	Geophyscist party days (HQ) for data interpretation & Report	**Days**															
5	Pitting/Trenching	**cu.m**															
6	Surface Drilling (1 rigs)	**m**															
7	Survey Party days	**days**															
8	Geologst Man days	**days**															
9	Sampler Man days	**days**															
10	Camp Winding	**months**															
11	Laboratory Studies	**Nos.**															
12	Report Writing with Peer Review	**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.																

Review for Scout Drilling

8.0.0 Justification

8.1.0 The proposed Bargur (G4) block area is part of Bargur belt and lies in the southern end of Kolar schist belt. The Bargur area is known for incidence of gold and two Ancient gold workings in Bargur area namely Sakalagunta and Bangaragunta were examined by M/s John Taylor & Sons in 1940s. 22 samples of soil collected from old dumps and shafts of Sakalagunta analysed 1.6 to 9.5 g/t gold. 15 out of 32 samples of soil and quartz collected from Bangaragunta analysed 1.5 g/t to 8 g/t gold (GSI, 1990, Records v (123 (5) p 169-183).

8.2.0. During the F.S.1988-89, Gopalakrishnan of GSI carried out preliminary investigation for primary gold in Bargur area. The surface and trench samples from Bargur area shown the incidence of gold. Out of 35 surface samples collected, 16 samples analysed 0.1 to 0.9 g/t of gold and one quartz vein sample collected from the Bangaragunta old working dump analysed 12 g/t of gold.

8.2.0 Trenching work has established a 75m long auriferous mineralised zone trending in N15°-20°W-S15°-20°E direction. The width of the zone varies from 0.65 m. to 4.45 m with gold values ranging from 0.2 to 0.96 g/t. The mineralised rock is amphibolite with veins and veinlets of quartz and pegmatite veins.

8.4.0 Gopalakrishnan (1990) opined that “Further detailed work is recommended to trace the strike continuity of the zone. One grab sample from the Bangaragunta old working pit (?) dump assayed 12 g/t of gold. Few trenches may be opened to expose the mineralised quartz zone and to see the strike continuity of the Bangaragunta quartz zone. The assay data of surface grab samples of various rock types has clearly indicated that the amphibolite enclosures/ bands in migmatites are as extensively mineralised with gold as their counterparts in the Kolar Schist Belt. These enclaves should therefore be extensively prospected for gold”.

8.5.0 In view of the above, the area hold potential for gold mineralisation and needs to be explored in detail with an integrated exploration approach at G4 stage to trace the further continuity of mineralisation in the extension areas and locate such possible ore bodies over a larger area

(117.50 sq.km). The present G4 stage exploration will be helpful to figure out the exact potentiality of the prospect.

8.6.0 The positive outcome of the present exploration would be helpful and facilitate the Govt. for auctioning of the block.

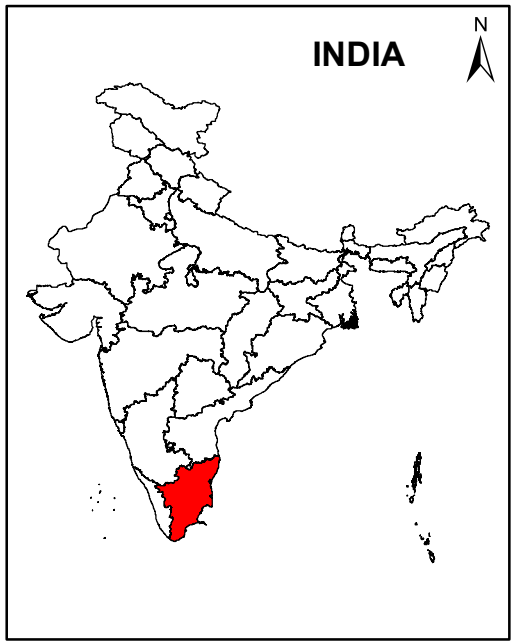
9.0.0 References:

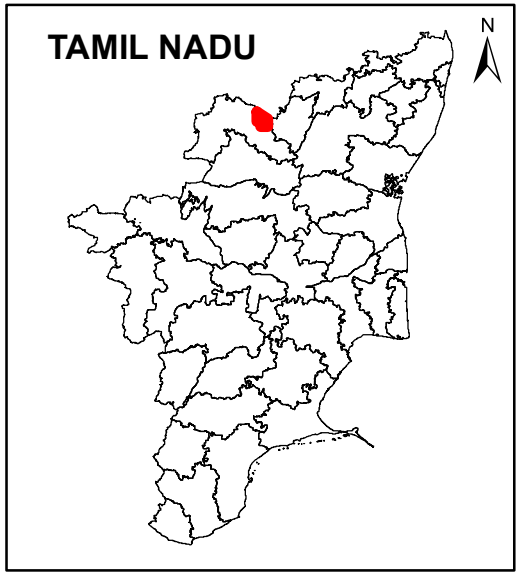
1. R. Gopalakrishnan, Preliminary Investigation for Primary Gold in Bargur Area, Krishnagiri Taluk, Dharmapuri District, Tamil Nadu, GSI unpublished report,1989.
2. Boseworth Smith, P., (1889) Report on the Kolar Gold Field and its south extension. Govt. Press, Madras.
3. Krishnaswamy, S. (1950) Geology of the Southern extension of Kolar Gold Fields (Unpublished report of G.S.I. for the field season 1949-50)
4. Iyengar, B.R.C and Gopal Rao, B.(1957) Progress Report for the field season 1955-56(Unpublished report of G.S.I)
5. Ford S.O. et.al. (1975) Prospecting for Gold near Krishnagiri,Dharmapuri district. Project for Mineral Exploration and development in Tamil Nadu under UNDP.
6. Shrivastava, S.K. (1983) Geology of part of Krishnagiri taluk,Dharmapuri district, Tamil Nadu (Progress Report for the field season 1982-83)Unpublished Progress Report of G.S.I.
7. Suthanandam, P. andGopalakrishnan R.,(1983) Investigation for gold in the southern extremityof Kolar Schist Belt, Dharmapuri district TamilNadu. Progress Report for the field season1981-82 (Unpublished)
8. Records of the Geological Survey of India (1990), Volume-123, Part -5 Page No. 169.

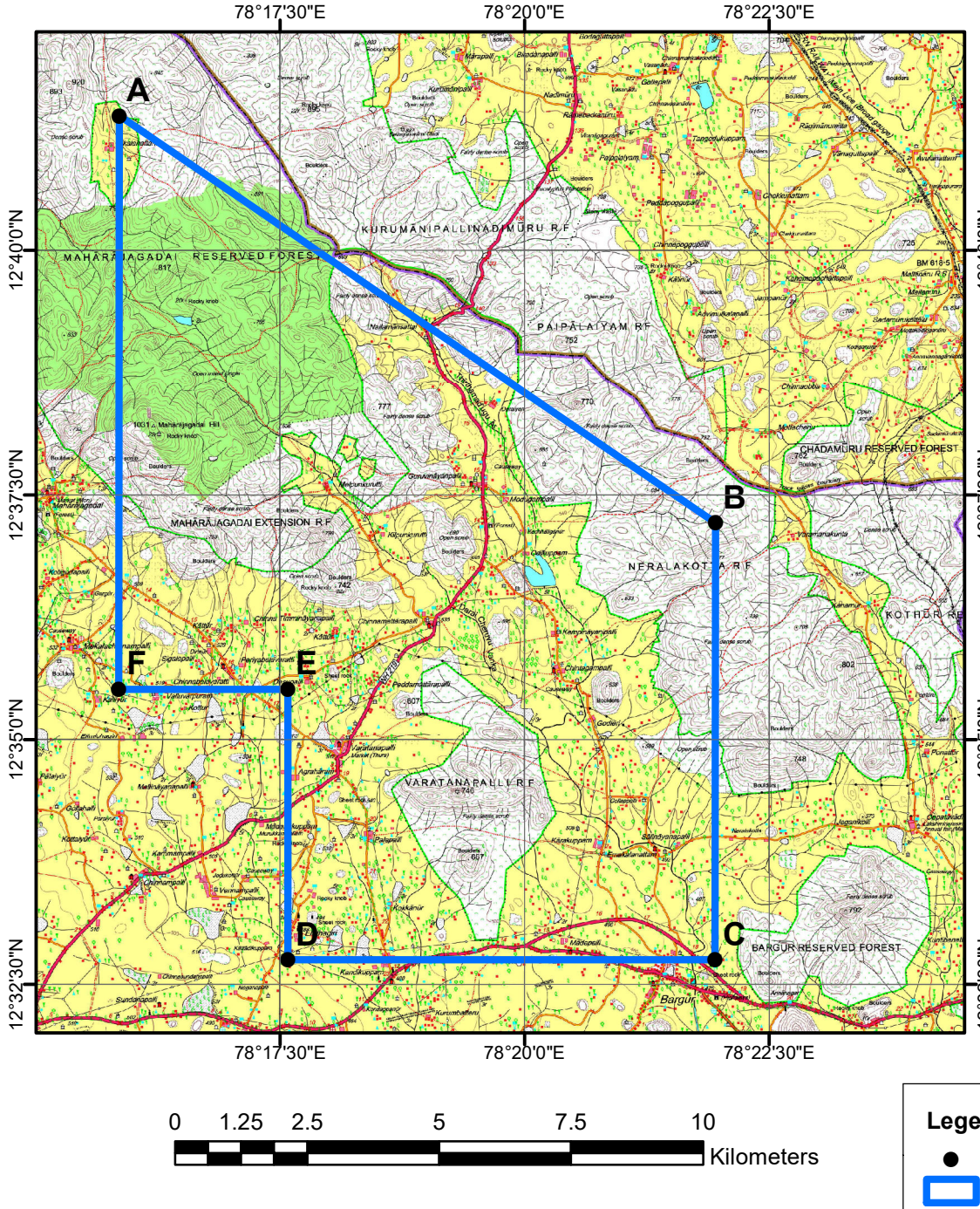
List of Plates:

Sl. No.	Description	Plate No.
1	Location Map of Proposed Bargur Block (G-4) for Gold over 117.50 sq.km area, Krishnagiri District, Tamil Nadu. (Part of Toposheet No. 57L/6)	Plate No. I
2	Regional Geological map of proposed Bargur Block, Krishnagiri District, Tamil Nadu.	Plate No. II
3	Geological map of proposed Bargur Block, Krishnagiri District, Tamil Nadu.	Plate No. III
4	Detailed Geological map (1:2000 scale) of Sakalagunta area, Bargur Block, Krishnagiri District, Tamil Nadu.	Plate No.IV

Location Map of Proposed Bargur Block (G-4) for Gold over 117.50 sq. km. area, Krishnagiri District, Tamil Nadu







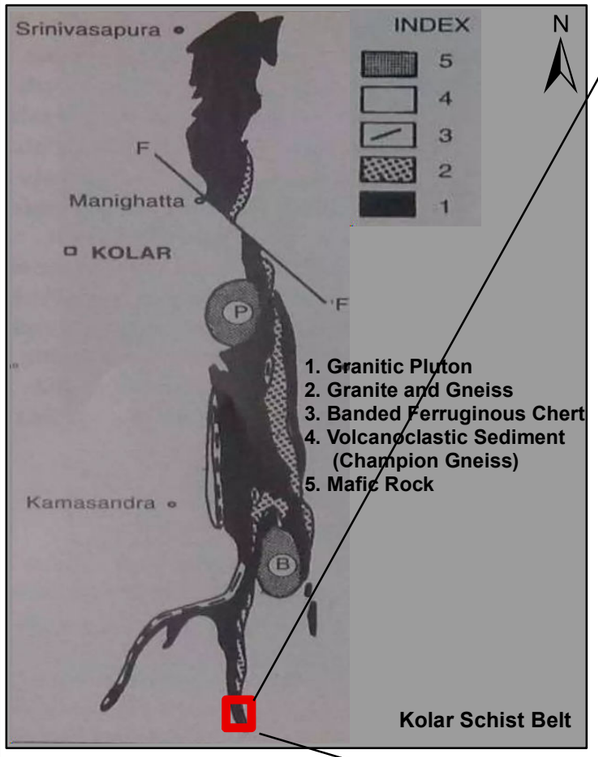
Coordinates of Corner Points of Proposed Bargur Block			
Sl. No.	Point	GCS-WGS1984 (DMS)	
		Latitude	Longitude
1	A	12°41'22.65" N	78°15'51.41" E
2	B	12°37'13.04" N	78°21'57.27" E
3	C	12°32'45.02" N	78°21'56.99" E
4	D	12°32'45.00" N	78°17'35.00" E
5	E	12°35'30.94" N	78°17'35.00" E
6	F	12°35'30.92" N	78°15'51.25" E

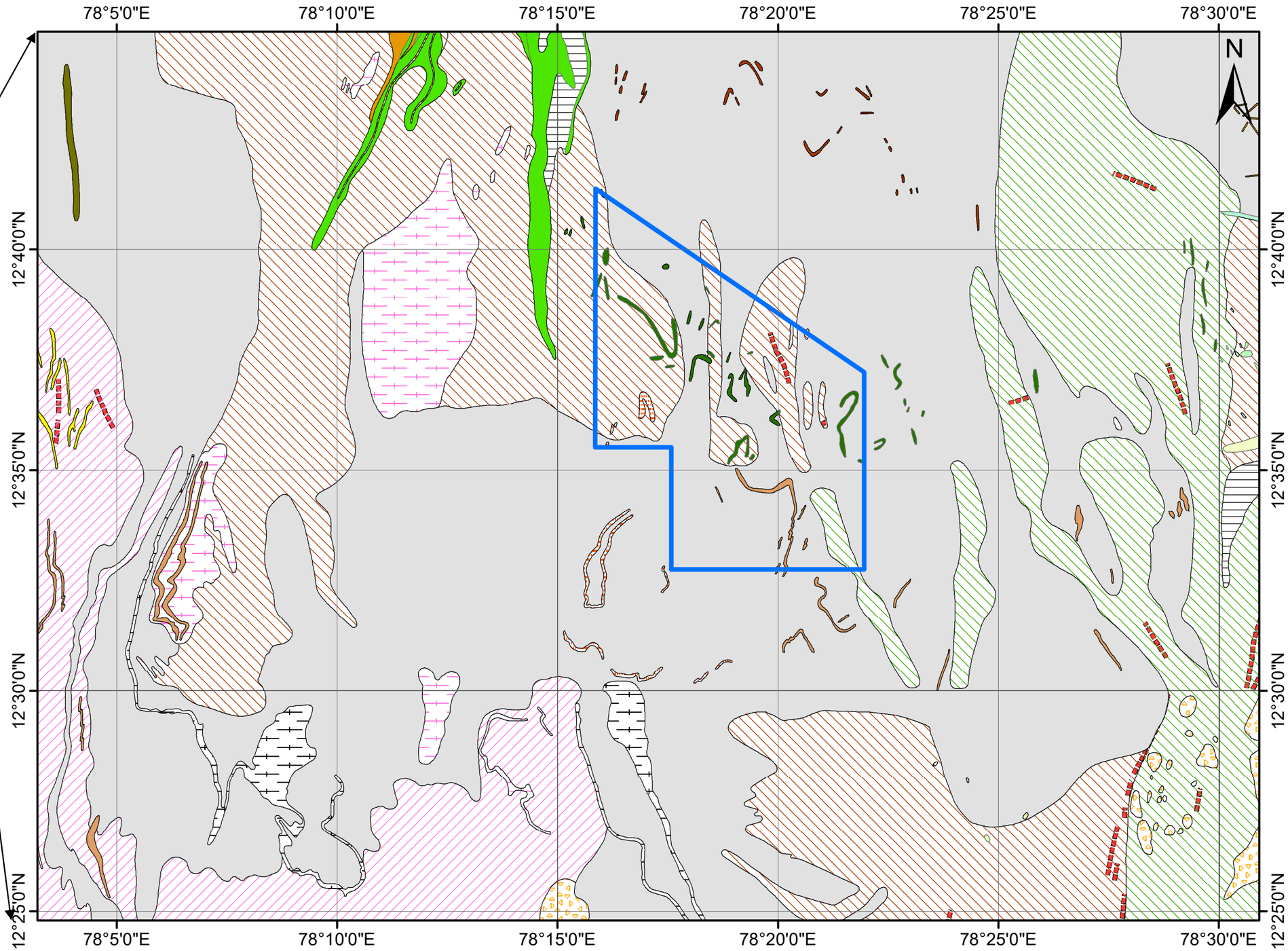
Source: Survey of India
Toposheet No. 57L/06

Legend

- PROPOSED BARGUR BLOCK CORNER POINTS
- PROPOSED BARGUR BLOCK

Regional Geology Map showing Proposed Bargur Block, Krishnagiri District, Tamil Nadu





Legend

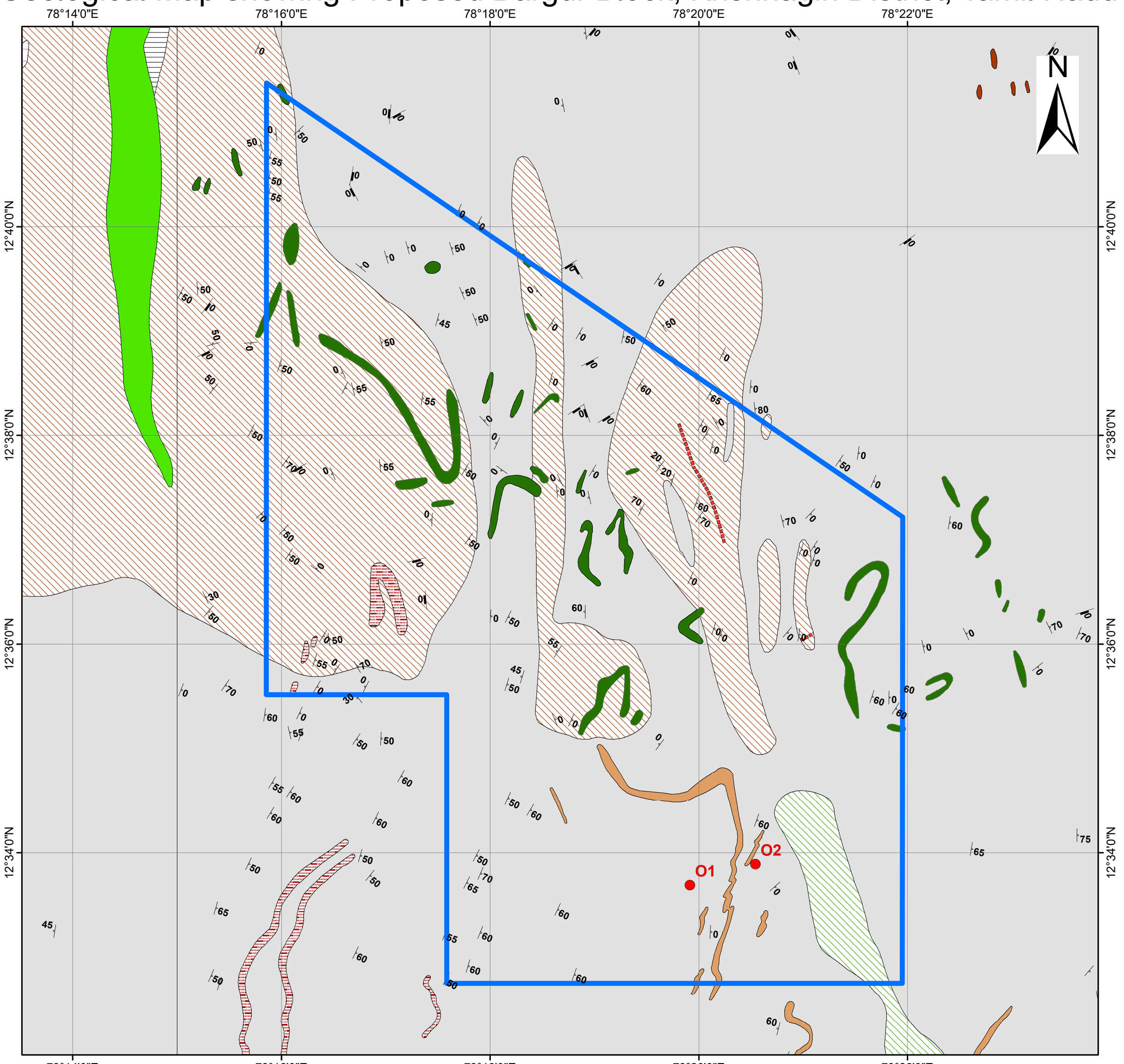
- PROPOSED BARGUR BLOCK
- ACID TO INTERMEDIATE CHARNOCKITE
- AMPHIBOLITE
- APLITE
- BANDED FERRUGINOUS QUARTZITE
- BANDED MAGNETITE QUARTZITE
- BIOTITE HORNBLENDE GNEISS
- BLACK SILTY CLAY (ACTIVE FLOOD PLAIN)
- CARBONATITE
- EPIDOTE-HORNBLENDE GNEISS
- FERRUGINOUS QUARTZITE
- GARNET-GRUNERITE-MAGNETITE-QUARTZITE
- GNEISS
- GRANITE
- GRANITE GNEISS
- GREY HORNBLENDE BIOTITE GNEISS
- META-BASALT
- META-PYROXENITE
- PEGMATITE
- PINK GRANITE GNEISS
- PINK MIGMATITE
- PYROXENE GRANULITE
- QUARTZ VEIN/REEF
- QUARTZITE
- Shear_Zone

1:175,000

0 2.25 4.5 9 13.5 18 Kilometers

Sorce: Bhukosh, GSI

Geological Map showing Proposed Bargur Block, Krishnagiri District, Tamil Nadu



1:50,000

0 0.5 1 2 3 4

Kilometers

Sorce: Bhukosh, GSI

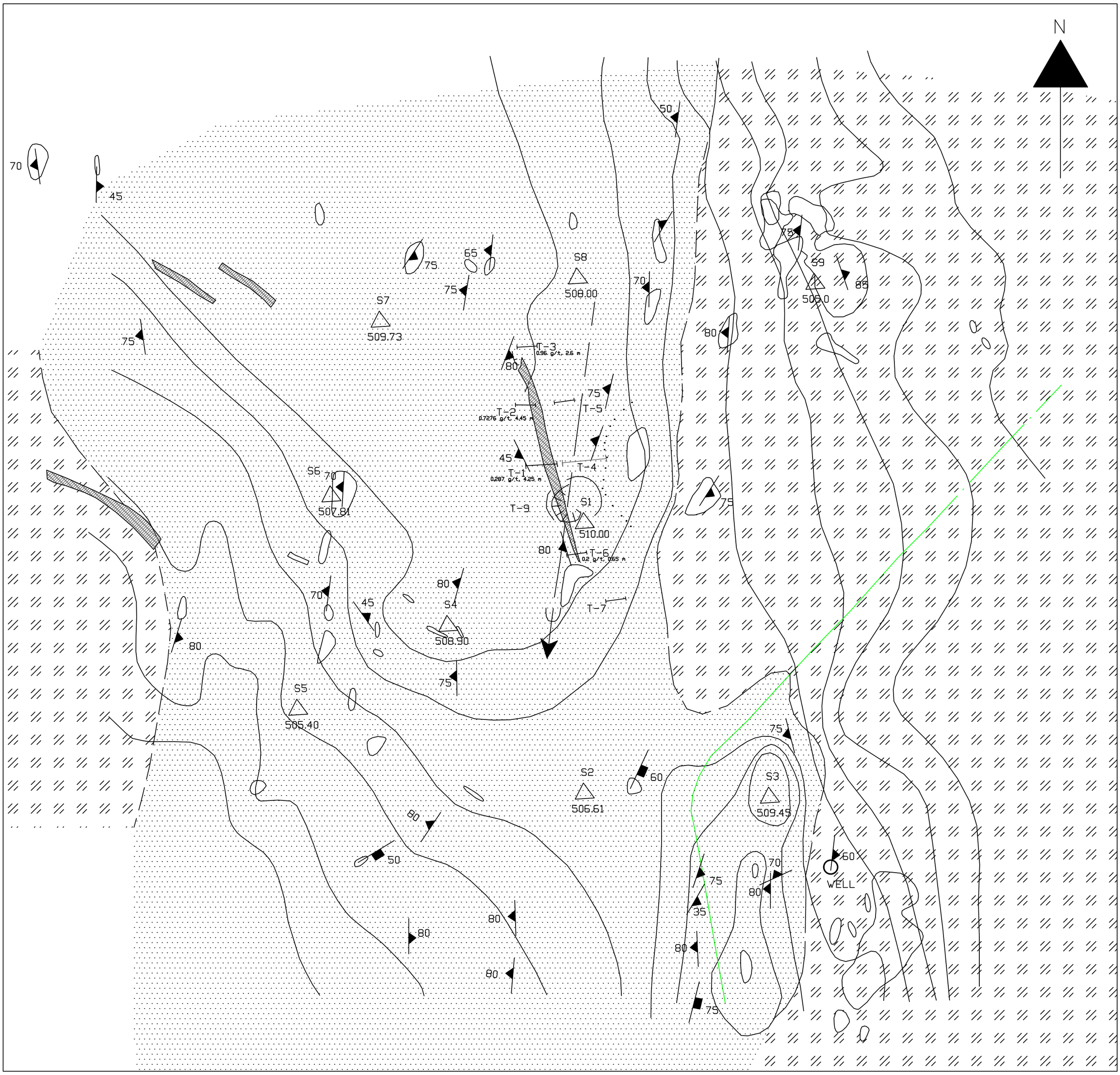
Legend

- PROPOSED BARGUR BLOCK
- Old Working
- AMPHIBOLITE
- BANDED FERRUGINOUS QUARTZITE
- BIOTITE HORNBLENDE GNEISS
- EPIDOTE-HORNBLENDE GNEISS
- FERRUGINOUS QUARTZITE
- GNEISS
- GREY HORNBLENDE BIOTITE GNEISS
- META-BASALT
- PINK GRANITE GNEISS
- PYROXENE GRANULITE
- Shear_Zone
- CLEAVAGE/FOLIATION/SCHISTOSITY (S1)
- JOINT

GEOLOGICAL MAP OF SAKALAGUNTA AREA, BARGUR, DHARMAPURI DISTRICT TAMIL NADU

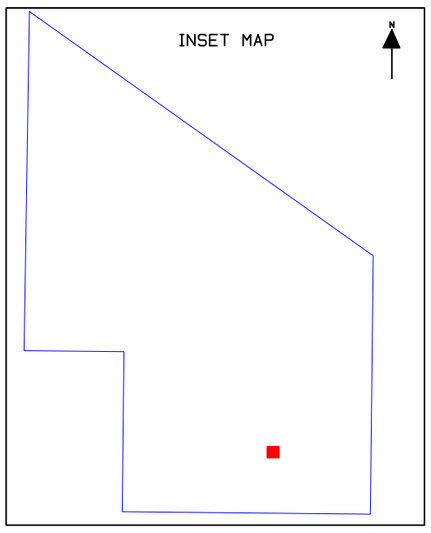
SCALE 1:1,000

Metre 20 — 0 — 20 — 40 — 60 — 80 Metre



INDEX

- Pegmatite
- Migmatite / Outcrops
- Amphibolite/Outcrops
- Old working pit (Sckala gunta)/Dumps
- Litho contact
- Mineralised Zone
- Contour
- Reserve forest boundary
- Strike and dip of folication (70)
- Strike and dip of joints (80)
- Trench (T-4)
- G.S.I Survey station with RL (5.6 / 505.40)



R. GOPALAKRISHNAN
Geologist (Jr)
F.S. 1988-89

(Reproduced from GSI)

Table No.VII.B

Cost Estimates for Reconnaissance Survey (G4) for Gold in Bargur block, District: Krishnagiri. Tamil Nadu. [Block area- 117.50 sq. km; Nos. of Borehole- 5; Borehole depth range- upto 100m; Schedule timeline- 14 months]

S. No.	Item of Work	Unit	Rates as per NMET SoC 2020-21		Estimated Cost of the Proposal		Remarks
			SoC-Item -Sl No.	Rates as per SoC	Qty.	Total Amount (Rs)	
A	**Geological Mapping Other Geological Work & Surveying**						
	Geological mapping, (1:12,500 scale) & Trenching , drilling work	140 sq.km					
i	a. Charges for Geologist per day (Field) for geological mapping & trenching work, drilling work	day	1.2	11,000	180	19,80,000	
ii	b. Labours Charges; Base rate	day	5.7	504	360	1,81,440	Amount will be reimburse as per the notified rates for unskilled labor by the Central Labour Commissioner or respective State Govt. whichever is higher
	c. Charges for Geologist per day (HQ)	day	1.3	9,000	60	5,40,000	
	d. Charges for one Sampler per day (1 Party)	one sampler per day	1.5.2	5,100	120	612000	
	e. Labours (4 Nos)	day	5.7	504	480	241920	Amount will be reimburse as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher
	Sub Total- A					**35,55,360**	
B	**Ground Geophysical Survey**						
1	IP. Induced Polarization (I.P) cum Resistivity S.P and Magnetic (30 Lkm)	Per Line Km	3.4b	14,48,693	3	43,46,079	(8 -10 line Km=14,48,693/-) (30LKm cummulative)
3	Geophysicist party days (Field)	per day	3.18	11,000	60	6,60,000	
4	c. Labours Charges	day	5.7	504	120	60480	Amount will be reimburse as per the notified rates for unskilled labor by the Central Labour Commissioner or respective State Govt. whichever is higher
5	Geophysicist party days (HQ)	per day	3.18	9,000	30	2,70,000	
	Sub Total- B					**53,36,559**	
C	**Survey work for geophysical survey layout & BH**						
a	DGPS Survey for BH fixation & RL determination	Per Point of observation	1.6.2	19,200	5	96000	5 Bhs
b	Charges of Surveyor (1 party) for Geophysical survey layout work & Block boundary demarcation	one surveyor per day	1.6.1a	8,300	45	373500	
c	Labours Charges for survey work;	day	5.7	504	180	90720	Amount will be reimburse as per the notified rates for unskilled labor by the Central Labour Commissioner or respective State Govt. whichever is higher
	Sub-Total C					**5,60,220**	
D	**Trenching/Pitting**						
	a) Excavation of Trenches	per cu.m	2.1.1.	3,330	200	**666000**	
E	**DRILLING**						
1	Drilling up to 300m (Hard Rock)	m	2.2.1.4a	11,500	500	57,50,000	
2	Borehole deviation Survey by Multishot Camera	m	2.2.6	330	500	1,65,000	
3	Land / Crop Compansation (in case the BH falls in agricultural Land)	per BH	5.6	20,000	5	1,00,000	Amount will be reimburse as per actuals or max. Rs. 20000 per BH with certification from local authorities
4	Construction of concrete Pillar (12"x12"x30")	per borehole	2.2.7a	2,000	5	10,000	
5	Transportation of Drill Rig & Truck associated per drill (2 rigs)	Km	2.2.8	36	2,400	86,400	1200 km to & fro from Nagpur/ Rig
6	Monthly Accomodation Charges for drilling Camp (up to 2 Rigs)	month	2.2.9	50,000	3	1,50,000	
7	Drilling Camp Setting Cost	Nos	2.2.9a	2,50,000	1	2,50,000	
8	Drilling Camp Winding up Cost	Nos	2.2.9b	2,50,000	1	2,50,000	
9	Road Making (Flat Terrain)	Km	2.2.10a	22,020	5	1,10,100	Road Making will be considered as per the requirement and Road Making Charges will be reimbursed for max. 5 km.
10	Drill Core Preservation	per m	5.3	1,590	160	2,54,400	
	Sub Total E					**71,25,900**	
F	**Borehole Geophysical Logging**	5 Bhs of 350m each	3.12	622.25	500	**3,11,125**	Base Rate Rs.10, 88, 941/1750=622.25per m
G	**LABORATORY STUDIES**						
1	**Chemical Analysis**						
i)	**Geochemical Sampling-Surface samples (Bedrock/Channel /Soil/Stream sediment)**						
	a. Au & Ag by Fire Assay	Nos	4.1.5a (Base rate 2380)	4,760	200	9,52,000	
	b. For Ni, Co, Cr, Cu, Pb, Zn, V, Ti	Nos	4.1.7a & 4.1.7b	3,511	50	1,75,550	Rs.2506 for 5 radicals & Rs 335 for each subsequent radical
	c. For PGE	Nos	4.1.5d	11,800	50	5,90,000	
ii)	**Surface Check samples (10% External)**						
	b) For Au & Ag by Fire Assay	Nos	4.1.5a (Base rate 2380)	4,760	20	95,200	
	b. For Ni, Co, Cr, Cu, Pb, Zn, V, Ti	Nos	4.1.7a & 4.1.7b	3,511	5	17,555	
	c. For PGE	Nos	4.1.5d	11,800	5	59,000	

S. No.	Item of Work	Unit	Rates as per NMET SoC 2020-21		Estimated Cost of the Proposal		Remarks
			SoC-Item -Sl No.	Rates as per SoC	Qty.	Total Amount (Rs)	
iii)	**Trench & Check Samples from**						
	Trench samples						
	a) For Au & Ag by Fire Assay	Nos	4.1.5a (Base rate 2380)	4,760	150	7,14,000	
	b. For Ni, Co, Cr, Cu, Pb, Zn, V, Ti	Nos	4.1.7a & 4.1.7b	3,511	50	1,75,550	Rs.2506 for 5 radicals & Rs 335 for each subsequent radical
	c. For PGE	Nos	4.1.5d	11,800	50	5,90,000	
iv)	**Trench Check samples (10% External)**						
	a) For Au & Ag by Fire Assay	Nos	4.1.5a (Base rate 2380)	4,760	15	71,400	
	b. For Ni, Co, Cr, Cu, Pb, Zn, V, Ti	Nos	4.1.7a & 4.1.7b	3,511	5	17,555	
	c. For PGE	Nos	4.1.5d	11,800	5	59,000	
v)	**BH Core samples**						
	a) For Au & Ag by Fire Assay	Nos	4.1.5a (Base rate 2380)	4,760	150	7,14,000	
	b. For Ni, Co, Cr, Cu, Pb, Zn, V, Ti	Nos	4.1.7a & 4.1.7b	3,511	50	1,75,550	Rs.2506 for 5 radicals & Rs 335 for each subsequent radical
	c. For PGE	Nos	4.1.5d	11,800	50	5,90,000	
vi)	**BH Core samples (10%External)**						
	a) For Au & Ag by Fire Assay	Nos	4.1.5a	4,760	15	71,400	
	b. For Ni, Co, Cr, Cu, Pb, Zn, V, Ti	Nos	4.1.7a & 4.1.7b	3,511	5	17,555	
	c. For PGE	Nos	4.1.5d	11,800	5	59,000	
vii)	**Composite Samples**						
	a. For Au & Ag by fire assay	Nos	4.1.5a (Base rate 2380)	4,760	10	47,600	
	b. 34 Elements by ICPMS	Nos	4.1.14	7,731	10	77,310	
2	**Physical & Petrological Studies**						
i	Preparation of thin section	Nos	4.3.1	2,353	10	23,530	
ii	Study of thin section	Nos	4.3.4	4,232	10	42,320	
iii	Preparation of polish section	Nos	4.3.2	1,549	10	15,490	
iv	study of polished section	Nos	4.3.4	4,232	10	42,320	
v	Digital Photographs	Nos	4.3.7	280	10	2,800	
vi	Whole Rock Analysis	Nos	4.1.15a	4,621	10	46,210	Rs.4200 for major oxides,421/- for each additonal trace element
vii	Sp. Gravity	Nos	4.8.1	1,605	5	8,025	
						54,49,920	
H	**Total A to H**					**2,30,05,084**	
I	**Geological Report Preparation**	**5 Hard copies with a soft copy**	**5.2**	Exploration cost exceeding 150 lakh but less than 300 lakh: A Minimum of ₹7.5 lakh or 3% of the work whichever is more		**7,50,000**	Reimbursement will be made after submission of the final Geological Report in Hard Copies (5 Nos) and the soft copy to NMET.
J	**Peer review Charges**		**As per EC decision**			**30,000**	
K	**Preparation of Exploration Proposal (5 Hard copies with a soft copy)**	**5 Hard copies with a soft copy**	**5.1**	2% of the Cost or Rs. 5.0 Lakhs whichever is less		**4,60,102**	EA will be reimbursed after submission of the Hard Copies and the soft copy of the final proposal along with Maps and Plan as suggested by the TCC-NMET in its meeting while clearing the proposal.
L	**Total Estimated Cost without GST**					**2,42,45,186**	
M	**Provision for GST (18% of J)**					**43,64,133**	GST will be reimburse as per actual and as per notified prescribed rate
N	**Total Estimated Cost with GST**					**2,86,09,319**	
				or Say Rs. In Lakhs		**286.09**	
Note:							
1	If any part of the project is outsourced, the amount will be reimbursed as per the Paragraph 3 of NMET SoC and Item no. 6 of NMET SoC. In case of execusion of the project by NEA on its own, a Certifiate regarding non outsourcing of any component/project is required.						

Table-VII.C

Schedule timeline for Reconnaissance Survey (G4) for Gold in Bargur Block, District: Krishnagir, Tamil Nadu

S. No.			1	2	3	4	5	6	7	8		9	10	11	12	13	14
1	Camp Setting	Months/Days															
2	Geological Mapping & Sampling	days															
3	Geophysical survey	L.km															
4	Geophyscist party days (HQ) for data interpretation & Report	Days															
5	Pitting/Trenching	cu.m															
6	Surface Drilling (1 rigs)	m															
7	Survey Party days	days															
8	Geologst Man days	days															
9	Sampler Man days	days															
10	Camp Winding	months															
11	Laboratory Studies	Nos.															
12	Report Writing with Peer Review	months															

Review for Scout Drilling

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.