

Regional Exploration Proposal (G-4 level) for Gold in VettukathiKotta Block, (Block-ID SR-KRL-02) in an area of 155 sq. km, District: Malappuram & Neelgiri, (Kerala)

SYNOPSIS

Mineral	Gold																											
Location	The block is located 8 km due North-east from Nilambur tahsil of Malappuram district headquarter on Malappuram-Gudaliur road. This road passes diagonally SW-NE through the block. The block is located in the Survey of India Toposheet No. 58 A/7. The coordinates of the corner points of the block area is given below and covers 155 sq.km area.																											
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Total area	155 Sq. Km																											
Background information	Geological Survey of India had carried out extensive surveys for gold by mapping and geochemical sampling in south of Nilambur valley (Mahadevan, 1965; Davey, 1975) and Reconnoitry drilling was carried out in Kappil-Mankanda-Kadannamanna area (Nair and Verma, 1999). The placer gold deposits are reported from Chaliyar and its tributaries which are thought to be derived from gold bearing quartz reefs of Waynad area north of this proposed area. Detailed investigation of gold in Veetikuthumala in Nilambur was carried out by Davey (1975) where old workings are plenty and found that they are closely associated with quartz veinlets occupying primary bedding planes of BMQ. David and Banerjee (1987), Anil Kumar (1995) and Nair &Verma (1999) carried out detailed geological mapping in and around Nilambur Valley and brought out the conclusion that origin of Gold lodes is due to post magmatic remobilization of syngenetic gold in shear zones.																											

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		-	Amphibolite / Hornblende Granulite																						
Objectives	The basic Geoscience data provided by GSI has been studied and evaluated. Based on the evaluation the present exploration programme has been formulated to fulfill the following objectives. i) To carry out geological mapping on 1:12,500 scale and demarcate the rock types of Gold-bearing formations with the structural features to identify the surface manifestations and lateral disposition of the ore body. ii) To collect surface samples to analyse for Au and associated elements and decide further course of exploration programme. iii) In case, surface samples give positive results supported by Remote sensing studies for mineral targeting and Geophysical survey giving sub-surface positive details for the extension of the ore body then 5 no's scout boreholes shall be drilled in the VettukathiKotta Block and other mineralized patches in the 155 sq.km area which in turn will decide the future course of exploration programme at G-3/G-2 category of UNFC. iv) To estimate reconnaissance Gold resources along with accessory elements as per UNFC norms and minerals (Evidence of Minerals Contents) Rules-2015 at G-4 level.																								

Time schedule	12 months
Cost estimate	Rs. 273.51 Lakhs
Exploration agency	MECL
Date of commencement	Yet to Commence

**Reconnaissance Survey Proposal (G-4 level) for Gold in Vettukathi Kotta Block,
(Block - ID SR-KRL-02), in an area of 155 sq. km., District: Malappuram & Nilgiri,
(Kerala)**

Sl. No.	Item of work	Unit (m)	Proposed Quantum of Work
1	Geological Mapping (on 1:12,500 Scale)	Sq. Km	155 sq. km.
2	Topographical Survey* (on 1:12,500 Scale in potential Zone Areas)	Sq. Km	As per requirement
3	Bore Hole Fixation* (Scout Boreholes)	Nos	5 Nos.
	& Coordinate Determination*	Nos	5 Nos.
Geochemical Sampling			
4	a) Bed Rock Sampling	Nos.	100 Nos
	b) Panning samples from stream sediments	Nos.	150 Nos
Ground Geophysical Survey* (Will be carried out in anomalous areas)			
5	a) Magnetic Survey	No of Sts.	1020 Nos
	b) Self Potential	No of Sts.	1020 Nos
	c) Resistivity	Line Km	20 Line Km
	d) Induced Polarization Survey at an station interval of 25m and line interval of 100m	Line Km	20 Line Km
6	Exploratory Mining*		
	Excavation (Trenching /Pitting)	Cu. m.	150 Cu m
7	Drilling (coring)*	m	600m (5 Bhs)
8	Geological work*		
	a) Geological Core Logging, Sample Preparation etc.	m	600m (5 Bhs.)
Laboratory Studies			
9	I) Surface Sampling (Primary samples)		
	i) Bed Rock samples		
	a) Au by Fire Assay	Nos.	100 Nos
	ii) Panning samples		
	a) Au by Fire Assay	Nos.	150 Nos
	iv) Check Samples (Bed Rock / Penning sediment)		
	a) Au by Fire Assay	Nos.	25 Nos
	v) Pit & Trench Primary & Check Samples*		
	a) Au by Fire Assay	Nos.	165 Nos
	vi) Drill Core (Primary + check) Samples*		
	a) Au by Fire Assay	Nos.	220 Nos
	vii) Composite Samples*		
	a) Au & Ag by Fire Assay	Nos.	20 Nos
10	Physical Studies*		
	a) XRD – Studies on Composite samples	Nos.	15 Nos
	b) Spectroscopic Studies *(La-MC-ICP MS Method Full Spectrum of 48 radicals)	Nos.	20 Nos
Petrological Samples * (Surface & BH Core Samples)			
11	a) Preparation of Thin Section	N0s	30 Nos
	b) Study of Thin Section	N0s	30 Nos

12	Mineragraphic Studies* (Surface & BH Core Samples)		
	a) Preparation of Polished Section b) Study of Polished Section	N0s N0s	20 Nos 20 Nos
13	Whole Rock Analysis* -		
	SiO ₂ , Al ₂ O ₃ , Fe ₂ O ₃ , TiO ₂ , MnO, CaO, Na ₂ O, K ₂ O+H ₂ O, MgO, P ₂ O ₅ , CO ₂ , & S.	Nos	10 Nos
14	Specific gravity Determination*	Nos.	25 Nos
15	Report Preparation* [As per Minerals (Evidence of Mineral Contents) Rule-2015]	N0	1
* The 2nd Level of work to be decided after Review of Geological Mapping & Geochemical Sampling			

Regional Exploration Proposal (G-4 level) for Gold in Vettukathi Kotta Block, (Block-ID SR-KRL-02) in an area of 155 sq. km, District: Malappuram & Neelgiri, (Kerala)

1.0.0 Introduction:

- 1.1.1 Since time immemorial, Gold has lured mankind for its beauty and is being widely used in Jewellery. Day by day demand of Gold is increasing. India is deficient in the production of gold. The increasing demand of Gold has been accorded high priority in the XIIth Plan document.
- 1.1.2 During the last three decades, no large Gold deposit has been discovered in India. However, the possibility of working of small mineral bodies in proximity to each other, through technological advances and increased operational efficiency, cannot be ruled out. Therefore, it is necessary to locate and explore such small sized deposits in clusters.
- 1.1.3 In view of the MMDR amendments act – 2015, Minerals (Evidence of Mineral Contents) Rule 2015 and Mineral Auction Rule – 2015, Ministry of Mines, GSI identified the block for exploration & MECL decided to take up the block for G-4 level of exploration under NMET funding. MECL requested Ministry of Mines, Government of India to reserve the block to carry regional exploration.
- 1.1.4 Ministry of Mines, Govt. of India allotted 30 Regional Mineral Exploration Blocks for G-4 exploration from the 100 reports handed over by GSI to MoM. The Regional Exploration for gold in Vettukathi Kotta block (Block ID SR-KRL-02) in 155 Sq. Km., District-Malappuram & Nilgiri (Kerala) is one of the blocks allotted to MECL. Accordingly MECL prepared proposal for regional exploration and being put up for approval of Technical Committee of NMET.

1.2.0 Location of the Block:

- 1.2.1 The block is located 8 km due North-east from Nilamburtahsil of Malappuram district headquarter on Malappuram-Gudaliur road. This road passes diagonally SW-NE through the block. The block is located in the Survey of India Toposheet No. 58 A/7. The coordinates of the corner points of the block area is given below and covers 155 sq.km area.
- A) 11°21' 18" N -76°15' 00"E B) 11°27' 8.2" N -76°15' 00"E
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1.3.0 Physiology and Drainage:

- 1.3.1 The North-eastern & Eastern portion of the block area is hilly terrain with valley portion between the ridges trending NE-SW. The rest of the block is of undulating terrain with isolated hillocks. The plains in the west are 10 to 20 m above MSL and the mounds

rise 40 to 60 m in the middle, the hills rise to about 300 m and in the east, over 100 m above mean sea level.

- 1.3.2 The streams of the block area shows dendritic drainage pattern, merging and forming Nalas flowing SW and in turn forming tributary system to Chaliyar River.

2.0.0 Previous work:

- 2.1.1 Geological Survey of India had carried out extensive surveys for gold by mapping and geochemical sampling in south of Nilambur valley (Mahadevan, 1965; Davey, 1975) and reconnaissance drilling was carried out in Kappil-Mankanda-Kadannamanna area (Nair and Verma, 1999). The placer gold deposits are reported from Chaliyar and its tributaries which are thought to be derived from gold bearing quartz reefs of Waynad area north of this proposed area.
- 2.1.2 Detailed investigation of gold in Veetikuthumala in Nilambur was carried out by Davey (1975) where old workings are plenty and found that they are closely associated with quartz veinlets occupying primary bedding planes of BMQ. David and Banerjee (1987), Anil Kumar (1995) and Nair & Verma (1999) carried out detailed geological mapping in and around Nilambur Valley and brought out the conclusion that origin of Gold lodes is due to post magmatic remobilization of syngenetic gold in shear zones.
- 2.1.3 Pillay and Koshy John (2004) carried out systematic stream sediment panning and geochemical analysis of Punnappuzha-Chaliyarpuzha sector and reported that the area north of Punnappuzha is the richest for placer gold and also reported that placer gold distribution is non uniform in stream sediments.

3.0.0 Geology and Structure:

3.1.0 Regional Geology and structure of the Area.

- 3.1.1 The litho-units exposed in and around the area belong to Peninsular Gneissic Complex of Archaean age and basement intruded by Quartz veins & pegmatite of Proterozoic age covered by laterite and alluvium of Cenozoic age. The litho-units show NE-SW trend. The Regional Stratigraphic Sequence of litho-units of the area (after GSI, District Resource map) is given below.

Regional Stratigraphic Sequence of the Litho-units of Area (after GSI)			
Age	Super Group	Group	Litho-units
Recent	-	-	Alluvium
Cenozoic	-	-	Laterite
Proterozoic	-	-	Quartz vein and Pegmatite
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4.0.0 Objective of the proposed exploration programme:

4.1.1 The basic Geoscience data provided by GSI has been studied and evaluated. Based on the evaluation the present exploration programme has been formulated to fulfill the following objectives.

- i) To carry out geological mapping on 1:12,500 scale and demarcate the rock types of Gold-bearing formations with the structural features to identify the surface manifestations and lateral disposition of the ore body.
- ii) To collect surface samples to analyze them for Au and associated elements and decide further course of exploration programme.
- iii) In case, surface samples give positive results supported by Remote sensing studies for mineral targeting and Geophysical survey giving sub-surface positive details for the extension of the ore body then 5 no's scout boreholes shall be drilled in the Vettukathi Kotta Block and other mineralized patches in the 155 sq.km area which in turn will decide the future course of exploration programme at G-3/G-2 category of UNFC.
- iv) To estimate reconnaissance Gold resources along with accessory elements as per UNFC norms and minerals (Evidence of Minerals Contents) Rules-2015 at G-4 level.

5.0.0 Proposed scheme of Exploration:

5.0.1 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 Content) Rules-2015. Accordingly, the following scheme of exploration is formulated in order to achieve the objective. The details of different activities to be carried out are presented in subsequent paragraphs.

5.1.0 Remote Sensing:

- 5.1.1 The entire 155sq. km area will be subjected for remote sensing studies to identify the lineaments and other structural features and the mineral potential zones by mineral targeting process.

5.2.0 Geological mapping:

- 5.2.1 Geological Mapping will be done on 1:12,500 scales in total 155 sq. km. area of the block. 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 map. Surface samples of various litho-units for petrological studies and from ore bodies for Gold assay with accessory minerals will be taken during the course of geological mapping.

5.3.0 Geochemical Sampling

5.3.1 Surface sampling (Bed Rocks Samples)

During the course of Geological mapping the Bed rock samples shall be collected from the out crops respectively. A total of 100 no's bed rock shall be collected, prepared and analyzed for Gold assay. 25 Nos of check samples from Bed rock and Stream Sediments will be analyzed for Au by Fire Assay.

5.3.2 Stream Sediment Sampling:

The stream sediment samples shall be collected from the entire study area of 155 sq. km. The samples shall be collected depending upon the Forest cover and accessibility of the area. A total of 150 stream sediment samples shall be collected from the study area.

5.4.0 Surveying:

- 5.4.1 The block boundary will be surveyed by DGPS and total station in WGS-84 datum for demarcation of block boundary points. Survey party will be associated with stream sediment sample and Bed rock sample collection by taking up the points and plotting its location on map for proper interpretation of the sample data. Survey party will also be associated with Geological Mapping. Rock types, their contacts, structural features etc. will be observed during Geological mapping and the Litho-contacts will be plotted for finalization of Geological map on 1:12,500 scale. During drilling scout boreholes, fixation and determination of reduced level and Co-ordinates of the boreholes only will be undertaken. If mineralized zones are identified, contouring of the surrounding areas of ore bodies would be done on 5 m contour intervals along with survey of surface features.

5.5.0 Geophysical Survey:

- 5.5.1 The area of the block is nearly 155 sq.km. The litho-units hosting mineralization are Quartz veins and Vein lets in Pyroxene granulites and Migmatite gneiss in shear zones & other schistose rocks, will be occupying valley portion or the slope of hills covered mostly by rubble & Soil. Hence, to assess the strike of the sub-surface ore

body continuation need of Geophysical survey is felt. 20 line Km in split in profile lines Magnetic, Self Potential, Resistivity and Induced Potential will be carried out in the Geophysical survey. The Magnetic and Self Potential Survey stations will be at 20 m spacing over these profiles.

5.6.0 Exploratory Mining

5.6.1 Trenching/Pitting:

Trenching and pitting shall be carried out in the potential zones identified based on the results of geological mapping & Geochemical sampling. A provision of shallow trenching of 150 cu. m. is kept. Pitting shall be done for correlation of mineralized zones on the surface up to a depth of 1 m after removal of soil/weathered column in the area. Locations of the pits & trenches on ground will be decided by field geologist based on field observations. A provision of 165 no primary & check trench/pit samples is kept for analysis of Au by fire assay. The pit & trench walls will be mapped on 1:200 scale. Thus 100 cu. M. of shallow trenching & pitting work along with associated

5.7.0 Core Drilling:

5.7.1 The remote sensing studies and Geophysical survey will be helpful in adding new area in the block in the strike continuity. Hence 5 scout boreholes involving 600 m of drilling will be undertaken for upper level of intersection.

5.8.0 Drill Core Logging:

5.8.1 The drill core will be logged for rock types, structural features, textures, intersection of ore zones, type of mineralization and occurrence of various rare minerals. The logging for determining the Rock quality determination will also be undertaken.

5.9.0 Drill core sampling

5.9.1 During the geological logging of drill core, mineralized zones will be marked on concentration wise and lithology wise. 200 no's of samples (primary) will be analyzed for Gold assay, 10% primary samples will be given for check. 20 no's composite samples will be analyzed for Gold and Silver assay.

5.10.0 Whole Rock Analysis:

5.10.1 10 No of samples shall be subjected to whole rock analysis to check the rock types, their variation in chemical composition, will be done for SiO_2 , Al_2O_3 , Fe_2O_3 , TiO_2 , MnO , CaO , Na_2O , $\text{K}_2\text{O}+\text{H}_2\text{O}$, MgO , P_2O_5 , CO_2 , & S Analysis.

5.11.0 Petrological Studies:

5.11.1 During the course of Geological mapping and drill core logging 30 no samples from various litho-units from surface and intersected in boreholes will be studied for petrography and 20 No of samples from mineralized zones will be studied for the ore mineral assemblages and their distribution, alteration, enrichment etc in polished sections.

5.12.0 Specific gravity Determination:

5.12.1 For the specific gravity determination 25 samples from the mineralized zones intersected in the boreholes will be sent to lab. 6.0.0

Time schedule and cost Estimate:

6.1.0 Time schedule

6.1.1 The proposed block area is nearly of 155 sq. km. there is possibility of getting sub-surface extension of the ore body in some new prospective areas. The details are indicated in bar chart given below.

5.15.0 Quantum of Work Proposed

5.15.1 The details of proposed quantum of work is given in the table below:

Reconnaissance Survey Proposal (G-4 level) for Gold in Vettukathi Kotta Block, (Block-ID SR-KRL-02), in an area of 155 sq. km., District: Malappuram & Nilgiri, (Kerala)			
Sl. No.	Item of work	Unit (m)	Proposed Quantum of Work
1	Geological Mapping (on 1:12,500 Scale)	Sq. Km	155 sq. km.
2	Topographical Survey* (on 1:12,500 Scale in potential Zone Areas)	Sq. Km	As per requirement
3	Bore Hole Fixation* (Scout Boreholes)	Nos	5 Nos.
	& Coordinate Determination*	Nos	5 Nos.
Geochemical Sampling			
4	a) Bed Rock Sampling	Nos.	100 Nos
	b) Panning samples from stream sediments	Nos.	150 Nos
5	Ground Geophysical Survey* (Will be carried out in anomalous areas)		
	a) Magnetic Survey	No of Sts.	1020 Nos
	b) Self Potential	No of Sts.	1020 Nos
	c) Resistivity	Line Km	20 Line Km
	d) Induced Polarization Survey at an station interval of 25m and line interval of 100m	Line Km	20 Line Km
6	Exploratory Mining*		
	Excavation (Trenching /Pitting)	Cu. m.	150 Cu m
7	Drilling (coring)*	m	600m (5 Bhs)
8	Geological work*		
	a) Geological Core Logging, Sample Preparation etc.	m	600m (5 Bhs.)
9	Laboratory Studies		
	I) Surface Sampling (Primary samples)		
	i) Bed Rock samples		
	a) Au by Fire Assay	Nos.	100 Nos
	ii) Panning samples		
	a) Au by Fire Assay	Nos.	150 Nos
	iv) Check Samples (Bed Rock / Penning sediment)		
	a) Au by Fire Assay	Nos.	25 Nos
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	a) Au by Fire Assay	Nos.	220 Nos
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10	Physical Studies* a) XRD – Studies on Composite samples	Nos.	15 Nos
	b) Spectroscopic Studies *(La-MC-ICP MS Method Full Spectrum of 48 radicals)	Nos.	20 Nos
11	Petrological Samples * (Surface & BH Core Samples)		
	a) Preparation of Thin Section	N0s	30 Nos
	b) Study of Thin Section	N0s	30 Nos
12	Mineragraphic Studies* (Surface & BH Core Samples)		
	a) Preparation of Polished Section	N0s	20 Nos
	b) Study of Polished Section	N0s	20 Nos
13	Whole Rock Analysis* -		
	SiO ₂ , Al ₂ O ₃ , Fe ₂ O ₃ , TiO ₂ , MnO, CaO, Na ₂ O, K ₂ O+H ₂ O, MgO, P ₂ O ₅ , CO ₂ , & S.	Nos	10 Nos
14	Specific gravity Determination*	Nos.	25 Nos
15	Report Preparation* [As per Minerals (Evidence of Mineral Contents) Rule-2015]	N0	1
* The 2nd Level of work to be decided after Review of Geological Mapping & Geochemical Sampling			

Time schedule (in months) for Regional Exploration Proposal (G-4 level) for Gold in Vettukathi Kotta Block, (Block-ID SR-KRL-02), in an area of 155 sq. km., District: Malappuram & Nilgiri, (Kerala)												
Item of Work	1	2	3	4	5	6	7	8	9	10	11	12
Geological Mapping (2 Party Days)	←				→							
Pan samples from Stream Sediment	←				→							
Bed Rock Sampling	←				→							
Surveying (1 Party Days) for Sampling etc	←				→							
Sample Preparation Bed Rock / Pan samples from Streams (2 Party Days)			←		→							
Analytical Work				←		→						
Geophysical Survey						←		→				
Surveying in Geophysical Survey (2 Party's)						←		→				
Geophysical Report								←		→		
Exploratory mining (1 Party) for Trenching / Pitting						←				→		
Geologist Party days for Pitting / Trenching Sampling work (1 Party)						←				→		
Drilling (600 m)								←		→		
Surveying (2 Party) for drilling, contouring and surface features							←			→		
Sample Preparation (Drill Core) Party Days (1 Party)									←		→	
Geologist Party days for Drilling and Sampling work & report work (1 Party)								←			→	
Analytical Work Drill Core Samples										←		→
Camp winding										←		→
Geological Report										←		→

6.2.0 Cost Estimate:

The Project cost with provisional escalation is estimated at **Say Rs. 273.51 Lakhs**. The details of item wise cost estimate with inbuilt actual escalation as on 31.3.2016 is given below.

SI No.	Item	Total Estimated Cost (Rs.)
1	Geological, Survey & Sampling Work	85,55,115/-
2	Geophysical Survey & Report	84,52,880/-
3	Exploratory Mining	2,77,950/-
4	Drilling	85,50,706/-
5	Laboratory Studies	12,43,650/-
	Subtotal	2,70,80,301/-
6	Report	2,70,803/-
	Total	2,73,51,104/-

Or Say Rs. 273.51 Lakhs (Rs. 2.74 Crore)

7.0.0 Justification:

- i) In view of MMDR Amendment & Mineral Auction Rule, 2015, GSI has identified this block for exploration MECL decided to take up the work under NMET funding.
- ii) In the proposed study area, known placer Gold locations are reported. There is possibility of getting fewprospectsidentified in the area or in any concealed shears. The Geophysical surveys will add to the Geological mapping for targeting the mineralized zone
- iii) The exploration will be helpful in estimation of reconnaissance resources of Goldand accessory minerals in block area.
- iv) The Regional Exploration will help in planning of detailed exploration programme which in turn will facilitate the State govt. for auctioning of block.

Cost Estimate for G-4 Level of Exploration for Gold in Vettukathi Kotta Block, (Block-ID SR-KRL-02)in 155 sq. km. area, District: malappuram & Nilgiri, (Kerala)						
Sl. No.	Item of Work	Unit	Base Rate 01-04-1990	Rates (2016-17)	Qty.	Amount
A	GEOLOGICAL WORK					
1	Survey Party days					
	a) Survey Party days (1party) For Sampling etc	days	1180	6,146	120	737520
	b) Survey Party days (2 party) For Geophysical Survey etc	days	1180	6,146	120	737520
	b) Survey Party days (2 party) For Drilling	days	1180	6,146	180	1106280
2	Geologist Party days					
	a) Geological Party days (2 Party) For Geological Mapping etc	days	1541	8,021	300	2406300
	b) Geological Party days (1 Party) For Pitting,Trenching	days	1541	8,021	135	1082835
	c) Geological Party days (1 Party) For Drilling, Core Sampling	days	1541	8,021	90	721890
3	Sampling Party days					
	a) Sample Preparation for Bed Rock, Soil , Stream samples (2 Partys)	days	525	2,945	180	530100
	b) Sample Preparation Pit/Trench (1 Party)	days	994	5,733	90	515970
	c) Sample Preparation Drill Cores (1 Party)	days	525	2,945	60	176700
4	Transportation (Light Vehicles, 2 nos)	day	Lumpsum	1,500	360	540000
	Sub-Total A					8555115
B	GEOPHYSICAL SURVEY & REPORT					
	Magnetic Stations	Nos.	107	482	1020	491640
	Self Potential Stations	Nos.	639	2,997	1020	3056940
	Resistivity	L. km	4168	18,710	20	374200
	Induced Potential	L. km	7860	2,17,505	20	4350100
4	Transportation (Light Vehicles, 2 nos)	day	Lumpsum	1,500	120	180000
	Sub-Total B					8452880
C	EXPLORATORY MINING					
1	Excavation (Trenching/Pitting)	Cu. m	395	1,853	150	277950
	Sub-Total C					277950
D	CORE DRILLING (5 BH)					
1	Surface Drilling (2 rigs)	m	2551	9,494	600	5696400
2	Transportations (2 Rigs)	Km	8.8	34	4000	136000
3	Accommodation (One time/ Drill)	Nos	185925	7,28,250	2	1456500
4	Camp Setting / Winding	Nos	68606	2,68,723	2	537446
5	Road Making (Flat Terrain)	Km	7800	20,368	20	407360
6	GI Core Boxes	Nos	Lumpsum	2,000	150	300000
7	Transportation Charges of Core Boxes	Km	8.8	34	500	17000
	Sub Total D					8550706
E	LABORATORY STUDIES					
1	Chemical Analysis					
	i) Surface sampling (Bed Rock Samples)					
	a) Au (By fire assay)	Nos.	205	1,127	100	112700
	ii) Panning Stream Sediment Samples					
	a) Au (By fire assay)	No	205	1,127	150	169050
	iii) Check Samples (Bed rock/ soil/ stream)					
	a) Au (By fire assay)	No	205	1,127	25	28175
	iv) Pit & Trench, Primary & Check Samples					
	a) Au (By fire assay)	No	205	1,127	165	185955
	v) BH Core Sampling, Primary & Check samples					
	a) Au (By fire assay)	Nos.	205	1,127	220	247940
2	vi) Composite Samples for 2 radicals					
	a) Au & Ag (Fire assay)	Nos	268	1,460	15	21900

	Physical Analysis					
	i) Petrographic Studies (BH core + Surface Samples)					
	a) Preparation of thin section	Nos	100	545	30	16350
	b) Study of thin section	Nos	228	1,495	30	44850
	ii) Mineragraphic Studies (BH core + Surface Samples)					
	a) Preparation of polished section	Nos	100	583	20	11660
	b) Study of polished section	Nos	364	2,118	20	42360
	iii) Whole rock analysis - SiO ₂ , Al ₂ O ₃ , Fe ₂ O ₃ , TiO ₂ , MnO, CaO, Na ₂ O, K ₂ O+H ₂ O, MgO, P ₂ O ₅ , CO ₂ & S	Nos	1316	6,386	10	63860
	iv) Specific Gravity Determination (BH)	Nos	32	198	25	4950
	v) XRD & Spectroscopic Studies					
	a) X-RD Studies on composite	Nos	1137	5,900	15	88500
	b) Trace Element Studies by ICPMS Studies for the full spectrum of 48 Elements / or Spectroscopic Studies (15 elements) *	Nos	7900	10,270	20	205400
	Sub-Total E					1243650
	Total (A+B+C+D+E)					27080301
F	EXPLORATION REPORT - 1% of (A+B+C+D+E)					270803
	GRAND TOTAL (A+B+C+D+E+F)					27351104
						Say Rs. 273.51 lakhs
Note	1-Revised rate of promotional work by MECL on behalf of Govt. of India vide letter no. 37(I)/2006-MI dated 02.07.2014 and based on actual escalation as per RBI indices as on 31.3.16 and provisional escalation of @15% points for drilling and 25% points for Geological & Laboratory Studies for subsequent year.					
	2- * Rate taken from GSI Schedule of rates as the same are not available in Goel Committee					