

**PRELIMINARY EXPLORATION FOR  
LIMESTONE IN KHAIRHA AREA  
(G-3 STAGE)  
RAIGARH DISTT., CHHATTISGRH**



**GOVERNMENT OF CHHATTISGARH  
MINERAL RESOURCES DEPARTMENT**

## EXPLORATION -01

**PRELIMINARY EXPLORATION FOR LIMESTONE IN KHAIRHA AREA (G-3 STAGE)  
RAIGARH DISTT., CHHATTISGRH**

**SUMMARY OF THE BLOCK:**

1.	Title of Project	Preliminary exploration for Cement Grade Limestone in Khairha area, Distt. Raigarh
2.	Mineral to be explored	Limestone
3.	Objective	Assessment of cement grade limestone.
4.	Level of proposed exploration	G-3
5.	State/District/Block/Area	Chhattisgarh/Raigarh/ Sarangarh/ Khairha
6.	Toposheet no.	64 O/2
7.	(a) Total area	5.0 Sq.km.
	(b) Coordinates of the block	(A) 83°03'55.02" to 21°35'21.81" (B) 83°03'55.46" to 21°34'34.39" (C) 83°02'48.38" to 21°34'04.43" (D) 83°02'16.60" to 21°34'06.34" (E) 83°02'26.23" to 21°34'53.64" (F) 83°02'39.11" to 21°35'21.41"
8.	Status of area	Free Hold
9.	Background information	
	a. Previous Work	GSI carried out G-2 level exploration for cement grade limestone in field season 2015-16 and 2016-17, in Kharri-Parsadih block of Sarangarh tehsil Distt. Raigarh. Estimated resources as follows:- (a) > 42% CaO - 41.29.MT (b) > 41.85% CaO – 28.44.MT (c) > 41.6% CaO – 6.40.MT (d) > 40% CaO -39.20 MT (e) (34-40)% CaO -31.72 MT <b>Khairha area is located adjacent to Kharri-Parsadih block</b> as shown in Map No 02
	b. Present status of the block	Un explored block.
	c. Mineral concession status	Free Hold area
10.	Status of various clearances	Non forest area
11.	Brief account of work proposed in the area and expected outcome	(1) Geological mapping 5.0 Sq.km (1:4,000 scale) (2) 8 No of Boreholes of 30 meter depth, with a total of 240 meter drilling. (3) Logging, sampling and chemical analysis etc. (4) Resource estimation and preparation of Geological Report as per Evidence of Mineral Content Rules, 2015.
12.	Details of work proposed in the area	<ul style="list-style-type: none"> <li>• Topographic survey in 1:4000 scale with contour interval of 2 m</li> <li>• Borehole Layout Plan</li> <li>• Determination of Borehole Collar coordinates.</li> <li>• Diamond Core Drilling of 08 boreholes (Map</li> </ul>

		<p>no.3)</p> <ul style="list-style-type: none"><li>• Geological Logging and Samples preparation.</li><li>• Chemical Analysis (Department Lab)</li><li>• Estimation of resources and Geological Report preparation</li><li>•</li></ul>
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COST ESTIMATE FOR PRELIMINARY EXPLORATION FOR IRON ORE IN KHAIRHA (G-3) DIST,RAIGARH, CHHATTISGARH								
SL. No.	Item of work	Unit	Base	Financial Year (2018-19)			Total	
				Rate	Esc. Rate	Qty.	Amount	Qty
			1.4.90	(Rs)		(Rs)		(Rs)
<b>A</b>	<b>GEOLOGICAL WORK</b>							
1	Survey party Days (1 party)	day	1180	5840	0	0	0	0
2	Geologist Party Days (1 Party)	day	1541	7802	30	234060	30	234060
3	Core Sampling Party days (2 parties)	day	525	2809	49	137641	49	137641
	<b>Sub Total A</b>					<b>371701</b>		<b>371701</b>
<b>B</b>	<b>DRILLING</b>							
1	Surface Drilling (2Rigs)	m.	1714	6780	270	1830600	270	1830600
2	Road making (Flat Terrain)	Km	7800	18583		0	0	0
	<b>Sub Total B</b>					1830600		1830600
<b>C</b>	<b>LABORATORY STUDIES</b>							
<b>a</b>	<b>Chemical Analysis</b>							
1	<b>Primary + Check Samples</b>							
	(i) for 6 radicals (CaO%, MgO%, SiO <sub>2</sub> %, Al <sub>2</sub> O <sub>3</sub> %, Fe <sub>2</sub> O <sub>3</sub> %, & LOI)	Nos	490 (76x5+110)	2580	270	696600	270	696600
	(ii) for Composit Samples (CaO%, MgO%, SiO <sub>2</sub> %, Al <sub>2</sub> O <sub>3</sub> %, Fe <sub>2</sub> O <sub>3</sub> %, P <sub>2</sub> O <sub>5</sub> & LOI)	Nos	566 76x5+110)	2982	27	80514	27	80514
	(iii) for Check Samples 6 radicals (CaO%, MgO%, SiO <sub>2</sub> %, Al <sub>2</sub> O <sub>3</sub> %, Fe <sub>2</sub> O <sub>3</sub> %, P <sub>2</sub> O <sub>5</sub> & LOI)	Nos	566 76x5+110)	2982	27	80514	27	80514
	<b>Sub Total C</b>					696600		<b>857628</b>
	<b>Total A+B+C</b>					<b>2898901</b>		<b>3059929</b>
D	Report Writing	Nos	60000	60000	1	60000	1	60000
	Sub Total					60000		60000
	<b>Total A to D</b>					<b>2958901</b>		<b>3119929</b>
E	GST 18%							561587
	<b>Grand Total: with GST 18%</b>							<b>3681516</b>
							<b>Total in Lacs</b>	<b>36.82</b>
Note:								
1	Revised rates of Promotional Work done by MECL on behalf of Govt. of India Vide letter No. 37(I)/2006M.I., dated-02/07/2014 and based on actual escalation as per RBI Indices as on 31-03-2017 and the same has been considered for subsequent year.							
2	Phosphorite rates have been considered as there is no rates for Limestone in revised Rates of Promotional Work of MoM scheduled							
3	**Nityanand Committee Rates with actual escalation as per RBI Index as on 31.03.2017 and the same for subsequent year.							
4	***As approved in the 12th meeting of the Technical Committee & the meeting of Executive Committee of NMET.							
5	****Rate has taken from Schedule of Charges of different activities of GSI on 2014-15 and 40% escalation on the same has been considered for F.Y. 2018-19							

Mineral Exploration and evaluation 18% (SAC Code: 998343)

## KHAIRHA AREA, DISTRICT RAIGARH

### 1. Introduction :

**Chhattisgarh is an ideal location to set up a cement plant due to:**

- Central location which provides access to ~40% of India's population and ~38% of India's GDP.
- Lower cost of land vis-à-vis other states due to low population density.
- Readily available power supply in the area
- Nearby power plants provide source of fly ash which provides cost advantages (Cost of transport borne by power plants within a radius of 100 Km)

Limestone is the principal raw material required for production of cement. Chhattisgarh has an estimated limestone resource of 8959 million tons (~5% of India's resource)

- 1.1 Location of Block:** The Study area is situated in the southwestern part of Raigarh district. Study area is about 61 km away from Raigarh district headquarters. It falls in Survey of India Toposheet No: - 64O/2. The Khairha area is located, East of Junadih village, North of Ranpagula & Bhainjnar villages whereas Ranisagar is located in northern part of the study area.

#### **Co-ordinates:**

As given in summary.

- 1.2 Physiography & Drainage:** Two major physiographic divisions i.e. Mahanadi plains and Sarangarh hills are present in the area. The Mahanadi plain area is mainly covered with alluvial soil and mostly forms low lying plains. The general elevation of the plain is 235 M above MSL.

On the other hand Sarangarh hills area mostly forming undulating hills in the form of open scrub showing bold topography. The major landforms area gentle hog bags of Chandarpur sandstone attain maximum height up to 486 M *above MSL* (Deodongar south west of Sarangarh). The area of the block is mostly flat and is characterised by agricultural land covered by lateritic soil.

### 2. Previous work:

- a. Murthy J.N. (1953-54) systematic mapping in part of Sakti and Raigarh teh. of Bilaspur and Raigarh Distt. (Unpublished report of G.S.I.). In southern portion of the Toposheet No. 64 O/1 the lower Cuddapah quartzites are no where exposed, but the shales overlying the quartzite are exposed near Nandeli, Litaipali, Bordaputi, Radhapur and a few other places in the eastern portion of this toposheet. The shales are red and purple in colour and at places, inter-bedded with fine to medium grained dark grey limestone. The beds show rolling dip ranging from 5° to 15° but the occasional high dips noticed at places are perhaps due to local slumping and faulting. In a few places the shales are found folded up into small anticlines and synclines which, however, are very local in nature.
- b. Murthy J.N. (1955-56) systematic geological mapping carried out in part of Sarangarh tehsil Toposheet No. 64O/6 Raigarh Distt. (Unpublished report of G.S.I.). Area under study comprises of Archaean and Cuddapah. Raipur Shales and limestone:-The Upper series of

the Cuddapah, chiefly composed of shales and limestone, conformably overlie the Chandrapur sandstones. These rocks are exposed in the plains of Sarangarh, on either side of the Mahanadi River. The region is mostly under soil cover, ranging in the thickness from a few inches to as much as eight ft, and hence the outcrops are few in number and these are mostly confined to nala cutting and well sections. Dark grey and grey fine-grained limestone bands occurring near Kanthipali and Sahajpali are being quarried on a small scale for lime burning.

- c. Murthy J.N. (1955-56) systematic geological mapping carried out in part of Raigarh and Gharchoda tehsil, Raigarh District Toposheet No. 64O/5 & N/8.

Raipur shales and limestone: - the upper argillaceous and calcareous group of rock known as Raipur shale and limestone are exposed in the plains south of Raigarh. The area south of Raigarh town, which forms a part of the Mahanadi valley, has a fairly thick soil cover. Its thickness ranges from a foot to as much as 6 feet. As such exposures are generally seen only in nala cuttings and stream sections.

The shales are red, purple and grey in colour and are inter-bedded with impure limestone. The rock has a regional southerly dip  $5^{\circ}$  to  $10^{\circ}$ . Local changes in the amount and direction of dip are not uncommon wherever the rocks have undergone slumping. High northerly dips of  $60^{\circ}$  to  $65^{\circ}$  in shale, noticed about a mile north of Raigarh town are due to local slumping.

- d. Gharpure V.B., Bhatt M.L. etc (F.S.-1972-75), Reconnaissance Survey of limestone around Sarangarh Tehsil Raigarh District. Vast resources of limestone mostly of cement grade are noted in Sarangarh tehsil. Detailed prospecting may prove the better grades of the rock. The limestone of Banipather-ulda belt, Katangpali-Mulda belt and ghoraghati-Jharapdih belt may further be explored.

Preliminary investigation for limestone was carried out in and around Kharri ( $21^{\circ}37'30''$ :  $83^{\circ}08'00''$ ) – Parsadih ( $21^{\circ}38'$ :  $83^{\circ}08'$ ) – Jharapdih ( $21^{\circ}36'$ : $83^{\circ}07'$ ) – Amethi ( $21^{\circ}36'$ : $83^{\circ}08'$ ) – Mahuadhora ( $21^{\circ}36'$ : $83^{\circ}09'00''$ ) – Karradhorhi ( $21^{\circ}36'$ : $83^{\circ}08'30''$ ) villages, Sarangarh tehsil, Raigarh district, Chhattisgarh in parts of Toposheet no. 64O/2 by Directorate of Geology and Mining, Chhattisgarh. The DGM, Raipur prepared Mineral Inventory of Raigarh district, Chhattisgarh on the basis of field work carried out during Field Seasons: 1972-75 (Gharpure V. B. et al.).

- e. Dutta D. R. et al., (1989) Geology of Tushgaon and Sarsiwa area, Raipur, Raigarh and Bilaspur districts, Madhya Pradesh (part of Toposheet nos. 64 K /10, 14, 15 & 64 O/2). These areas are mainly occupied by the Chhattisgarh Supergroup of rocks which are unconformably overlying the Precambrian basement crystalline. The sedimentary rocks, generally trending WNW-ESE with gentle northerly dip, belonging to the Chandarpur and Raipur Groups are exposed.

- f. Roy I. et al., (2002-2003) have carried out prospecting for kimberlite in Sarangarh-Chandrapur sectors in parts of Bardwar sub-basinal area and south Raigarh Crystalline Belt, Raigarh and Janjgir-Champa districts, Chhattisgarh state by detailed stream sediment sampling. 35 samples were analysed by SEM, only one garnet grain has been identified to be calcium saturated chrome pyrope variety (G - 9 types) (Dawson and Stephens, 1975). This is a typical kimberlite indicator. This has later been confirmed by EPMA study.

- g. Ghosh P. et al., (2003-04) carried out search for new kimberlite clan rocks in basal Chhattisgarh Formations and surrounding granitic terrains between Sarangarh and Saraipali area, Mahasamund and Raigarh districts, Chhattisgarh. The nature and quantum of work included a reconnaissance survey of 1000 sq km, collection of 100 stream sediment samples, 10 Petrological 15 samples and 10 petrochemical samples. No indicator minerals for kimberlitic clan rocks like garnet, spinel were recovered from stream sediment samples.
- h. DGM (CG), Regional office Bilaspur (2016) took the Khairha area for further evaluation and underwent closed spaced surface sampling of 1 km<sup>2</sup> area around villages Kutela and Durgapali which is around 02 km SW Khairha area, as given in table below.

Table No. 1 -Analysis result of Limestone Samples of adjacent block

S. No.	Sample No.	Location	SiO <sub>2</sub> %	Fe <sub>2</sub> O <sub>3</sub> %	Al <sub>2</sub> O <sub>3</sub> %	CaO %	MgO %	LOI %	Total
1	001	83° 2' 30.84" : 21° 36' 55.81"	14.00	1.90	4.40	43.06	1.29	34.98	99.63
2	002	83° 2' 30.39" : 21° 36' 35.36"	10.68	1.20	3.12	47.56	0.16	37.10	99.82
3	003(T)	83° 2' 30.40" : 21° 36' 14.02"	12.28	1.30	4.00	45.53	0.32	35.81	99.24
4	003(B)	83° 2' 48.56" : 21° 36' 57.51"	15.12	1.70	4.28	43.74	0.16	34.25	99.25
5	BH (T)	83° 2' 47.86" : 21° 36' 43.28"	22.34	1.90	10.04	36.11	0.64	28.86	99.89
6	BH(B)	83° 2' 48.12" : 21° 36' 21.94"	12.72	1.40	5.30	43.96	0.96	35.36	99.70
7	KH 1	83° 3' 4.88" : 21° 36' 35.64"	10.20	1.00	2.80	48.00	0.16	37.60	99.76
8	Q1	83° 2' 50.72" : 83° 2' 50.72"	17.90	1.60	4.40	39.92	2.09	33.65	99.56
9	Q3	83° 3' 14.28" : 21° 36' 14.29"	11.74	1.10	3.00	46.88	0.32	36.89	99.93

Note:-Inspection note of regional office Bilaspur (2016)

- i. Somprakash Sahu and Velladurai S. (F. S.: 2015-16) Report on exploration for limestone in kharri - Parsadih block, Raigarh district, Chhattisgarh. Following investigation works were carried out:-

Table No.2- Details of investigation works

Nature of work	Target for FS 2015-16	Achievements
1. DM (1:4,000)	8.5 sq km	8.5 sq km
2. Drilling	1500 m	1500 m
3. Samples		
BRS	30 nos.	30 nos.
Core Samples	1000 nos.	1000 nos.
PCS	10 nos.	10 nos.
XRD	10 nos.	10 nos.
4. Chemical analysis SiO <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> , Fe <sub>2</sub> O <sub>3</sub> , CaO, MgO, Na <sub>2</sub> O, K <sub>2</sub> O	1050 nos.	1050 nos.

G2 stage of exploration for limestone was carried out in Kharri– Parsadih area, Sarangarh tehsil, Raigarh district, Chhattisgarh in part of Toposheet No. 64O/2 under item no: 173/ME/CR/CG/2015/86 of FS 2015-16 as part of the annual field season program (FSP) of Geological Survey of India (GSI). The exploration work included detailed mapping of 8.5 sq km on 1:4,000 scale, chemical analysis of 1000 core samples, 30 bed rock samples (BRS), 10 petrochemical samples (PCS) and 10 samples for XRD studies.

The study area consists of limestone of Charmuria Formation and calcareous shale of Gunderdehi Formation of Chhattisgarh Supergroup. The area is mostly covered by soil and exposures of limestone & shale are observed in nala sections. The limestone is characterized by whitish grey to dark grey in color, fine grained in nature, and compact, bedded and at places massive. Shale is purple to pink in color and calcareous in nature. Bedding is defined by color and compositional layers. The rocks are trending NW-SE to NE-SW with gentle dip (3° - 10°) towards NE and NW respectively. Calcification and silicification are noticed along fracture planes in limestone.

Total 50 vertical boreholes were drilled each with 30 m average depth on grid pattern at an interval of 400 m. The limestone core recovery was more than 95%. The lithologies intersected in the boreholes are limestone, calcareous shale, sandstone, siltstone and soil. Out of 50 bore hole, 30 boreholes are positive & economically significant in which limestone has been intersected from 0.5 to 14 m bgl and continued up to 30 m bgl. The thickness of limestone varies from 16 m to 29.5 m. In the remaining boreholes, calcareous shale was intersected. Limestone occurs mainly as continuous band and sometimes with very thin intercalation of calcareous shale and sandstone/siltstone. In some boreholes limestone compositionally grades into shaly limestone and at places, it is cherty in nature. The limestone is traversed by vein lets of calcite and quartz vein.

35.20 million tonnes of limestone has been estimated with more than 40% CaO for the south western part of the block with 42.07% CaO, 18.02% SiO<sub>2</sub> and <1 % MgO, 41.29 million tonnes with 41.61% CaO, 17.97% SiO<sub>2</sub> and <1 % MgO for the north eastern part and 6.40 million tonnes with 41.85% CaO, 16.29% SiO<sub>2</sub> and <1 % MgO for the south eastern part. 28.44 million tonnes of limestone has been estimated with 34 - 40 % CaO for the south western part of the block 46 with 35.73% CaO, 24.91% SiO<sub>2</sub> and <1 % MgO, 31.72 million tonnes

with 37.04% CaO, 23.22% SiO<sub>2</sub> and <1 % MgO for the north eastern part and 1.62 million tonnes with 35.7% CaO, 28.5% SiO<sub>2</sub> and <1 % MgO for the south eastern part.

Total 82.89 million tonnes of limestone with more than 40% CaO, 17.86% SiO<sub>2</sub> and <1 % MgO and 61.78 million tonnes of limestone with 34 - 40 % CaO, 24.17% SiO<sub>2</sub> and <1 % MgO has been estimated. Gross resource of limestone for the block is 144.67 million tonnes with an average grade of 39.39 % CaO, 20.68% SiO<sub>2</sub> and <1 % MgO. As per United Nations Framework Classification (UNFC), Kharri– Parsadih limestone deposit can be described as bedded stratiform type with irregular habit (Type – I) and falls under E-3 (Economic axis), F-3 (Feasibility axis) and G-2 (Geological axis) i. e. 332.

### **3. Geology and Structure:**

Exposures of limestone of Charmuria Formation and shale of Gunderdehi Formation of Chhattisgarh Supergroup are observed in nala section. Some small limestone quarries are present in the area. The limestone is characterized by whitish grey to dark grey in colour, fine grained in nature, and compact, bedded and at places massive. The rocks are trending NW-SE to NE-SW with gentle dip (3° - 10°) towards NE and NW respectively. Generalised Stratigraphic succession (after GSI) is as follows:-

Lithology	Formation	Group	Supergroup	Age
Laterite and gravel				Recent
Variegated sandstone & shale	Kamthi Formation		} Gondwana Supergroup	Triassic to
				Cretaceous
Sandstone	Barakar Formation			Carboniferous to Permian
Green sandstone	Talchir Formation		Gondwana Supergroup	Carboniferous to Permian
-----Unconformity-----				
Sandstone	Dhurkot Fm			} Meso – Neoproterozoic
Dolerite				
Dolostone	Hirri Formation	} Raipur Group	} Chhattisgarh Supergroup	
Purple calcareous shale	Gunderdehi Formation			
Limestone, shale & sandstone	Charmuria Formation			
Shale, sandstone, Coarse quartzite		} Chandrapur Group		
Clay shale, Fine quartzite		} Singhora Group		
sandstone, Siliceous shale, Feldspathic grit and conglomerate				
-----Unconformity-----				
Granite Gneiss			Dongargarh Supergro	Paleoproterozoic

### Surface indication of mineralisation:

A few exposures of limestone of Charmuria Formation of Chhattisgarh Supergroup are observed in the area. Limestone which is mostly concealed under soil cover forms the lower most horizon of Raipur Group. The exposures of limestone are observed in nala section north, north east & north-west of Jharapdih, south and south west of Gadhabhata, SE of Basinbahra, north & NW of

Mahuadhora and west of Bohardih villages. Quarry section of the limestone is marked 20 out in north of Parsadih, northwest of Bohardih, north east of Dongiya, south of Kharri, north west of Mahuadhora, south west of Gadhabhata and north west of Jharapdih villages. It is characterized by grey to dark grey in color, fine grained in nature, compact, bedded and at places massive in nature.

Bedding is defined by color banding, observed in Ghoghra nala section. Bedding parallel joint in limestone is observed north of Mahuadhora and west of Parsadih villages. Strike direction varies from NW-SE to NE-SW with gentle dip ( $3^{\circ}$  -  $10^{\circ}$ ) towards NE and NW respectively. Calcite veins occur within limestone at places. NW of Parsadih and Bohardih villages, limestone is highly fractured and brittle in form; calcite and quartz vein lets have traversed along the fracture plane. A number of limestone quarries are located within the block. They vary in dimension and the largest quarries with the dimension of  $\sim 100$  m X 30 m X 10 m are located south of Kharri and north of Parsadih villages.

#### **Mode of occurrence:**

Limestone occurs as bedded stratiform deposit of irregular habit, in a few places interclation of shale and sandstone/siltstone observed.

#### **Nature of mineralization:**

The principal components of the limestone are the mineral calcite. It is characterized by whitish grey to dark grey in color, fine grained in nature, and compact, bedded and at places massive. Veinlets of calcite are observed along the fracture plains in limestone.

#### **Details of mineralized zone:**

The study area is mostly covered by soil, few exposures of limestone of Charmuria Formation of Chhattisgarh Supergroup are observed. It is characterized by whitish grey to dark grey in colour, fine grained in nature, and compact, bedded and at places massive. The limestone is traversed by veinlets of calcite and quartz veins. Strike of bedding varies from NW-SE to NE-SW with gentle dip ( $3^{\circ}$ - $10^{\circ}$ ) towards NE and NW respectively. The high angle dip ( $>20^{\circ}$ ) observed in limestone and shale, in west of Parsadih, south west of Murpar and North West of Mahuadhora villages. Exposures of limestone are observed in nala section north, north east & north-west of Jharapdih, south and south west of Gadhabhata, SE of Basinbahra, north & NW of Mahuadhora and west of Bohardih villages. Limestone is also observed in quarry sections north of Parsadih, northwest of Bohardih, north east of Dongiya, south of Kharri, north west of Mahuadhora, south west of Gadhabhata and north west of Jharapdih villages. Strike length and width of deposit of Kharri-Parsadih limestone block is 4 km X 400 m Calcification and silicification are noticed along fracture planes in limestone and shale.

#### **Genesis of mineralization/Genetic model for mineralisation:**

The limestone belonging to Charmuria Formation of Chhattisgarh Supergroup is of Meso-Neoproterozoic in age. Biogenic origin is not possible as the rock is devoid of living organism, hence the genesis of this could be chemical precipitation from sea water.

## Local Geology:

Lithounits of Raigarh group (Gunderdehi & Charmuria Formation) are exposed in the block. Stratigraphic sequence of the block is as follow:

Lithology	Formation	Group	Supergroup	Age
Soil				Recent
Calcareous shale	Gunderdehi Formation	Raipur Group	Chhattisgarh Supergroup	Meso – Neoproterozoic
Arkosic sandstone, Intraformational conglomerate, Limestone	Charmuria Formation			

General geological characteristics of the rocks belong to Khairha area is as follows:

- Occurrences of predominantly argillite and carbonate sequences, which is the result of second cycle of sedimentation under warm stable shelf condition;
- All bedding planes were observed to be sub-horizontal .
- Limestone is fine to medium grained, light to dark grey and laminated.
- Shale is typically yellowish to pink/purple, friable, splintery and occasionally calcareous;

#### 4. Objective of the proposed exploration:

The exploration is aimed to delineating the disposition of limestone bed and their qualitative characteristics as well as quantitative assessment for cement grade limestone.

#### 5. Proposed scheme of exploration:

Basic geological data has been collected and evaluated. Based on this present exploration programme has been formulated to fulfill objectives as per Evidence of Mineral Content Rules 2015.

**5.1 Geological Mapping** – Reconnaissance Geological Mapping (Scale 1:12,500) to demarcate the exposures of limestone and other lithounits. Surface Sampling- During the course of Geological mapping the exposed rock samples shall be collected from the out crops

**5.2 Surveying:-** The block boundary will be surveyed by Total Station in WGS-84 datum for demarcation of block boundary points. Survey will be associated with Bed rock samples collection by taking up points and plotting its location on the map for proper interpretation of the sample data.

During drilling borehole fixation and determination of reduced level, co-ordinates of boreholes will be undertaken.

Detailed topographical survey of the area for preparation of topographical map on 1:4000, scale with 2 m contour interval showing all the permanent and semi-permanent features such as roads, nalla, village, pond etc.

**5.3 Core Drilling:** - A total of 08 boreholes planned within the block, with an average depth of 30 meters.

**5.4 Drill Core Logging:** - Lithological logging of the core will be done.

**5.5 Drill core sampling:** - During the lithological logging of drill core every 1meter of core will be taken as 1 representative sample. All the samples generated through core drilling will be analysed.

### **5.6 Quantum of work proposed**

**Remark-** Somprakash Sahu and Velladurai S. (F. S.: 2015-16) Report on exploration for limestone in kharri - Parsadih block, Raigarh district, Chhattisgarh (Geological Survey of India), general exploration work carried out in Kharri- Parsadih area. Total 82.89 million tonnes of limestone with more than 40% CaO, 17.86% SiO<sub>2</sub> and <1 % MgO and 61.78 million tonnes of limestone with 34 - 40 % CaO, 24.17% SiO<sub>2</sub> and <1 % MgO has been estimated. Gross resource of limestone for the block is 144.67 million tonnes with an average grade of 39.39 % CaO, 20.68% SiO<sub>2</sub> and <1 % MgO. As per United Nations Framework Classification (UNFC), Kharri– Parsadih limestone deposit can be described as bedded stratiform type with irregular habit (Type – I) and falls under E-3 (Economic axis), F-3 (Feasibility axis) and G-2 (Geological axis) i. e. 332.

**Khairha area is located adjacent to Kharri- Parsadih area therefore this area is proposed for G-3 level exploration through NMET fund.**

**Table No.3:** The detail of quantum of work proposed:-

<b>Time Schedule (in month) For exploration programme in Khairha block, distt. Raigarh</b>												
<b>Item of work</b>	<b>Months</b>											
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
Geological mapping	◆											
Bed rock sampling	◆											
Surveying ( one party)	←	→										
Drilling	←	→										
Survey party for contouring and surface feature		←	→									
Sample preparation	←	→										
Geologist party days for drilling sampling	←	→										
Analytical work	←	→										
Camp binding			←	→								
Geological report	←	→										

Table No.4: Quantum of work proposed

<b>S.NO.</b>	<b>ITEM OF WORK</b>	<b>QUANTUM OF WORK PROPOSED</b>
1	Geological mapping, 1 :12,500 scale	5.0 Km <sup>2</sup>
2	Topographical survey 1 : 4000 scale	5.0 Km <sup>2</sup>
3	Drilling (coring)	240 m
5	<b>Geological work</b>	
6	a) Core logging	240 m
7	b) Core sampling	44 days
8	<b>Laboratory studies</b>	
9	Surface sampling (Rock)	
10	<b>Physical studies</b>	
	a) Petrological studies	-
	b) Mineralogical studies	-
	c) Report preparation As per mineral Rule 2015	

## DATA, INSTRUMENTS AND SOFTWARE TO BE USED FOR GEOREFERENCING OF MAPS

To carry out Prospecting operation Survey of India Toposheet on 1:50,000 scale and Khasra map on 1:4,000 will be taken as base map.

### Data

1. Survey of India, Toposheet no 64 O/2 on 1:50,000 scale
2. District Resource map GSI
3. 50 K Map
4. Satellite data IRS 1;12,000 scale ( Geo coded LISS IV)

### Instruments and Machines:-

5. Total station-01
6. Drilling Machine -02
7. Jeep, Truck, Tractor, Tanker, water supply pump etc.

### Technical staff available in DGM

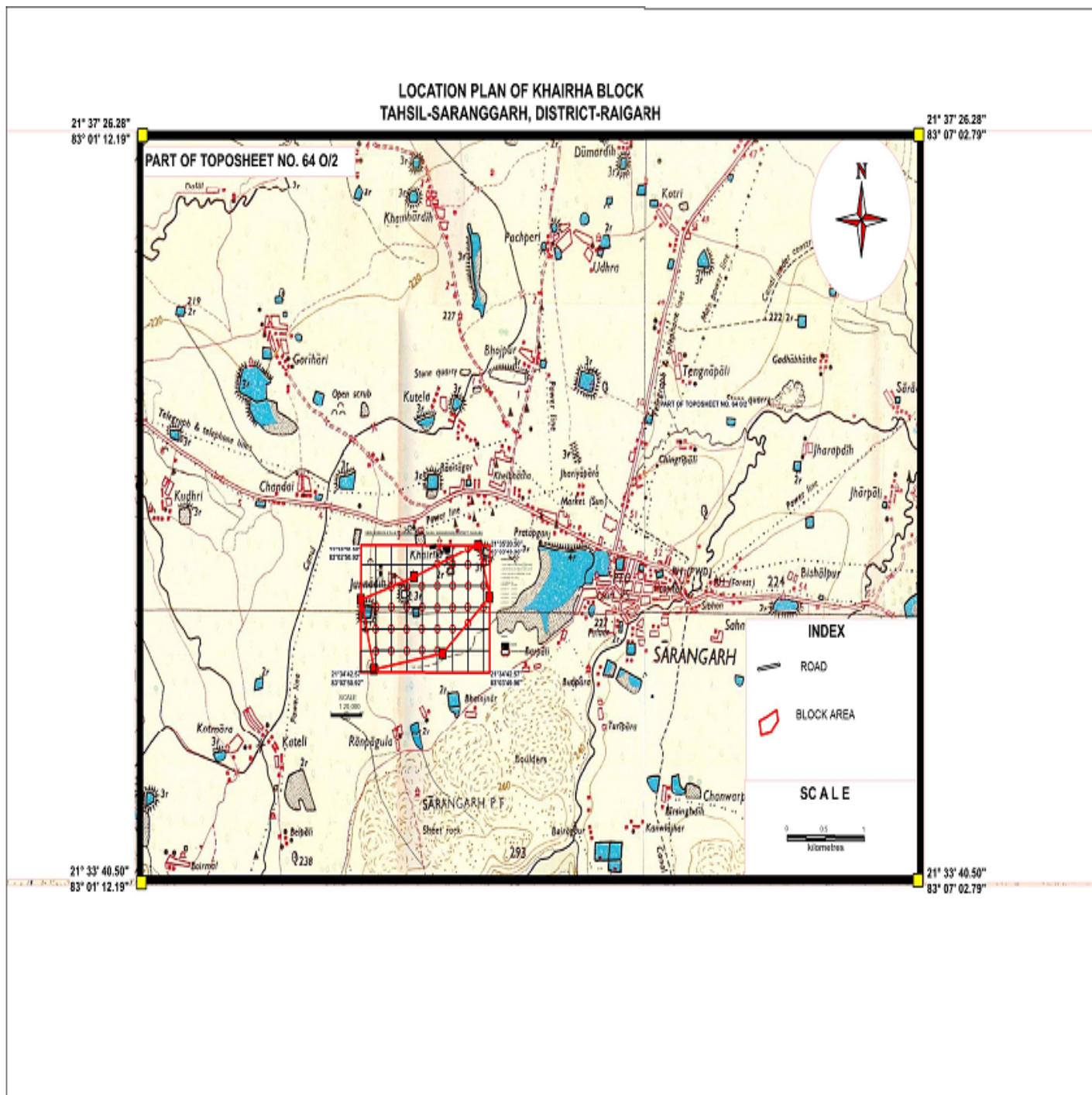
8. Geologist-02
9. Survey team
10. Drilling team at one drill machine (Drilling machine-1, Asstt. Driller-1, Helper-1)
11. Chemical analysis:-  
Full flesh chemical laboratories are working in Raipur, Bilaspur and Jagdalpur

### 6. References :-

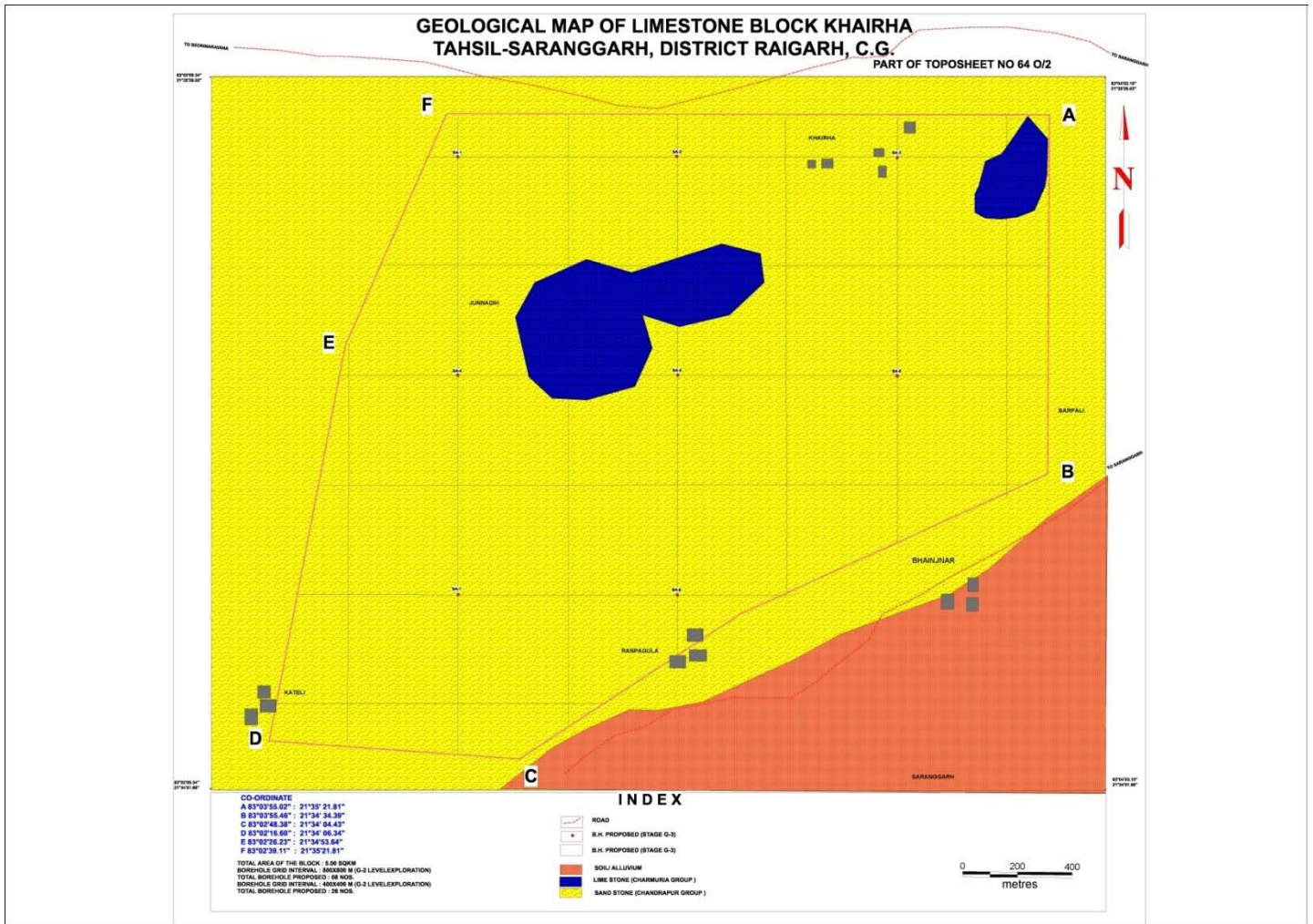
Sl. No.	Title of the report	Authors	Name of the publication
1.	Search for the source rock of alluvial diamonds in the Mahanadi valley, Raigarh district, M. P., (parts of 14oposheet nos. 64 O/1, 2, 6 & 7).	Murti K. S.	Report- F. S. 1972-73
2.	Mineral Inventory of Raigarh district, Chhattisgarh by DGM, Raipur.	Gharpure V. B. Et al.	Report- F. S. 1972-75
3.	Geology of Tushgaon and Sarsiwa area, Raipur, Raigarh and Bilaspur districts, Madhya Pradesh (part of 14oposheet nos. 64 K /10, 14, 15 & 64 O/2).	Dutta D. R. Et al.	Report- F. S. 1987-88
4.	Prospecting for Kimberlite in Sarangarh-Chandarpur sectors in parts of Banadwan sub basinal area and south Raigarh Crystalline Belt, Raigarh and Janjgir – Champa districts, Chhattisgarh State.	Roy I. Et al.	Report- F. S. 2002-2003
5.	Search for new kimberlite clan rocks in basal Chhattisgarh Formations and surrounding granitic terrains between Sarangarh and Saraipali area, Mahasamund and Raigarh districts.	Ghosh P. Et al.	Report- F. S. 2003-04

6	Interpretation and integration of aerogeophysical data and remote sensing data with modelled aerogeophysical anomaly pertaining to Chhattisgarh and Orissa (Raigarh & Sundargarh area) parts of degree sheets 64N, O & 73B.	Natarajan A. Ganganna & Gadagkar N. S.	Report- F. S. 2005-06
7	Report on the progress of the detailed exploration for flux grade limestone in Akaltara block, Bilaspur district, M.P., (parts of 15oposheet nos. 64K/5 & 64J/8).	Yewale R. J., Bhadra S.	Report- F. S. 1967-68
8	An interim report on the flux grade limestone investigation of Akaltara block, Bilaspur district, M.P., (parts of 15oposheet nos. 64K/5 & 64J/8).	Shukla R., Yewale R. J., Bhadra S.	Report- F. S. 1967-68
9	A report on the detailed exploration for SMS and BF grade limestone in Deragarh-Belhadih block Bilaspur district, M.P., (parts of 15oposheet nos. 64J/16 & 64K/12).	Bhadra S.	Report- F. S. 1968-69
10	A report on the detailed exploration for flux grade limestone in Chilhati block, Bilaspur district, M.P., (parts of 15oposheet nos. 64K/5 & 64J/8).	Deshmukh A.B., Shukla R., Natrajan V.	Report- F. S. 1969-70
11.	Report on exploration for limestone in kharri - Parsadih block, Raigarh district, Chhattisgarh.	Somprakash Sahu and Velladurai S	Report- F. S. 2015-16

Map No.1:



Map No. 2



New Delhi, the 21<sup>st</sup> June, 2018

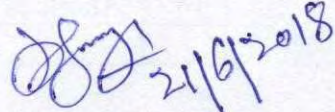
**OFFICE MEMORANDUM**

**Subject: Approval of mineral exploration projects in 14 blocks of DMG Chhattisgarh.**

On the recommendation of Technical-cum-Cost Committee (TCC) of NMET, the Executive Committee in its 8<sup>th</sup> meeting, held on 12<sup>th</sup> June, 2018 approved mineral exploration projects in 14 blocks of DMG Chhattisgarh. The list of projects is enclosed as **Annexure-I**.

2. These 14 mineral exploration projects will be funded by NMET as per the costing recommended by the TCC and approved by the Executive Committee. The Implementing Agency shall complete the same as per the approved cost estimates and time schedule, enclosed in **Annexure II to XV**.

3. The work execution shall be monitored by DMG Chhattisgarh. The TCC, NMET shall review the progress of projects and provide update every six months to the Executive Committee. The Implementing Agencies shall submit progress on monthly basis to NMET.



(Pradeep Singh)  
Director, NMET

To  
The Director,  
Directorate of Geology and Mining  
Govt. of Chhattisgarh,  
Indravati Bhawan, Block No-4, 2<sup>nd</sup> floor,  
Naya Raipur- 492002.

Copy to:

1. Sh. D. Mohanraj, ADG, NM-II& Chairman, NMET TCC, Geological Survey of India, Seminary Hills, Nagpur- 440 006.
2. The Member Secretary, NMET TCC, MECL, Dr. Babasaheb Ambedkar Bhawan, Seminary Hills, Nagpur- 440 006.

**List of mineral blocks of DMG Chhattisgarh approved in 8<sup>th</sup> Executive Committee on  
12.06.2018**

Sl. No.	Block Name	Commodity	Stage	Duration	Estimated Cost (Rs. in Lakh)
1	Dumarguda Block, Dist. Surguja	Bauxite	G-3	10 months	65.51
2	Murtadand Block, Dist. Surguja	Bauxite	G-3	8 months	47.58
3	Dandkesra North Area Mainpat Dist. Surguja	Bauxite	G-3	8 months	37.98
4	Parpatia Area Mainpat Dist. Surguja	Bauxite	G-3	10 months	177.24
5	Khamardih-Gatadih Area, Distt. Raigarh	Limestone	G-3	6 months	34.97
6	Khairha Area, Distt. Raigarh	Limestone	G-3	6 months	36.82
7	North Bailadila Area, Dist.-Raigarh	Iron Ore	G-4	12 months	91.48
8	Hurtarai Area Block, Dist.-Kanker	Iron Ore	G-4	12 months	90.77
9	Rowghat Block, Dist. Kanker	Iron Ore	G-4	12 months	90.77
10	Rajhara Block, Dist. Balod	Iron Ore	G-4	12 months	91.48
11	Salhewara Block, Dist. Rajnandgaon	Iron Ore	G-4	12 months	91.48
12	Narayanapur Block, Dist. Narayanapur	Iron Ore	G-4	12 months	73.15
13	Notified Area Block, Dist. Kanker	Iron Ore	G-4	12 months	63.55
14	Aturbeda Area Block, Dist. Kanker	Iron Ore	G-4	12 months	79.19
				<b>Total</b>	<b>1071.97</b>

## Annexure-III

COST ESTIMATE FOR PRELIMINARY EXPLORATION FOR BAUXITE IN DUMARGUDA AREA (G-3) DIST. SURGUJA, CHATTISHGARH								
SL. No.	Item of Work	Unit	Financial Year (2018-19)				Total	
			Base Rate	Esc. Rate	Qty.	Amount	Qty.	Amount
			1.4.90	(Rs)		(Rs)		(Rs)
<b>A</b>	<b>DRILLING</b>							
1	Surface Drilling ( 2 Rigs)	m.	1714	6780	490	3322200	490	3322200
2	Road Making (Flat Terrain)	Km	7800	18563		3322200		3322200
	Sub Total A							
<b>B</b>	<b>GEOLOGICAL WORK</b>							
1	Survey Party Days ( 1 party)	day	1180	5840				
2	Geologist Party days (1 party)	day	1541	7802	10	78020	10	78020
3	Core Sampling Party days(2 parties)	day	525	2809	100	280900	100	280900
	Sub-Total B					358920		358920
<b>C</b>	<b>LABORATORY STUDIES</b>							
<b>a</b>	<b>Chemical Analysis</b>							
1	Primary + Check Samples							
	i) for Primary Samples 5 radicals (TiO <sub>2</sub> , Ga, V, SiO <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> , Fe <sub>2</sub> O <sub>3</sub> & LOI)	Nos	414 (76x4+110)	2378	588	1398264	588	1398264
	ii) Analysis of REE	Nos	-	7681	10	76810	10	76810
	iii) for Composit Samples 5 radicals (TiO <sub>2</sub> , Ga, V, SiO <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> , Fe <sub>2</sub> O <sub>3</sub> & LOI)	Nos	414 (76x4+110)	2378	58	137924	58	137924
	iv) for Check Samples 5 radicals (TiO <sub>2</sub> , Ga, V, SiO <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> , Fe <sub>2</sub> O <sub>3</sub> & LOI)	Nos	414 (76x4+110)	2378	58	137924	58	137924
	Sub-Total C					1398264		1750922
	Total A+B+C					5079384		5432042
<b>D</b>	<b>Report Writing</b>	Nos	120000	120000	1	120000	1	120000
	Sub Total					120000		120000
	TOTAL A to D					5199384		5552042
<b>E</b>	<b>GST 18%</b>							999358
	Grand Total : with GST 18%							6551410
								Total IN Lacs
								65.51
<b>Note:</b>								
1	Revised Rates of Promotional Work done by MECL on behalf of Govt. of India Vide letter No. 37(I) /2006-M.I. dated- 02/07/2014 and based on actual escalation as per RBI indices as on 31-03-2017 and the same has been considered for subsequent year.							
2	Phosphorite rates have been considered as there is no rates for Limestone in Revised Rates of Promotional Work of MoM Schedule							
3	***Nityanad Committee Rates with actual escalation as per RBI index as on 31.3 2017 and the same for subsequent year.							
4	*** As approved in the 12th meeting of Technical Committee & th meeting of Executive Committe of NMET.							
5	**** Rate has taken from Schedule of Charges of differen activities of GSI as on 2014-15 and 40% escalation on the same has been considered for FY 2018-19.							

Mineral Exploration and evaluation 18%(SAC Code: 998343)

B.P. Ratan

B.P. Ratan  
member secretary  
TCC, NMET

5.8 QUANTUM OF WORK PROPOSED

Table No. 1: The detail of quantum of proposed work is given below:-

Time Shedule (in month) For exploration programme in Dumarguda block, Mainpat plateau distt. Surguja										
Item of work	1	2	3	4	5	6	7	8	9	10
Geological mapping	↔									
Bed rock sampling	↔									
Surveying ( one party)	←	→								
Drilling		←	→							
Survey party for contouring and surface feature	←			→						
Sample preparation		←	→							
Geologist party days for drilling sampling and report work	←				→					
Analytical work Drill core sample		←				→				
Camp winding						←	→			
Geological report							←	→		

Ratun  
BP. Ratun

## Annexure-III

COST ESTIMATE FOR PRELIMINARY EXPLORATION FOR BAUXITE IN MURTADAND AREA (G-3) DIST. SURGUJA, CHATTISHGARH								
SL. No.	Item of Work	Unit	Base	Financial Year (2018-19)			Total	
				Rate	Esc. Rate	Qty.	Amount	Qty.
			1.4.90	(Rs)		(Rs)		(Rs)
<b>A</b>	<b>DRILLING</b>							
1	Surface Drilling ( 2 Rigs)	m.	1714	6780	290	1966200	290	1966200
2	Road Making (Flat Terrain)	Km	7800	18563				
	Sub Total A					1966200		1966200
<b>B</b>	<b>GEOLOGICAL WORK</b>							
1	Survey Party Days ( 1 party)	day	1180	5840		0	0	0
2	Geologist Party days (1 party)	day	1541	7802	10	78020	10	78020
3	Core Sampling Party days(2 parties)	day	525	2809	63	176967	63	176967
	Sub-Total B					254987		254987
<b>C</b>	<b>LABORATORY STUDIES</b>							
<b>a</b>	<b>Chemical Analysis</b>							
1	Primary + Check Samples							
	i) for Primary Samples 5 radicals (TiO <sub>2</sub> , Ga, V, SiO <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> , Fe <sub>2</sub> O <sub>3</sub> & LOI)	Nos	414 (76x4+110)	2378	588	1398264	588	1398264
	ii) Analysis of REE	Nos	-	7681	10	76810	10	76810
	iii) for Composit Samples 5 radicals (TiO <sub>2</sub> , Ga, V, SiO <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> , Fe <sub>2</sub> O <sub>3</sub> & LOI)	Nos	414 (76x4+110)	2378	58	137924	58	137924
	iv) for Check Samples 5 radicals (TiO <sub>2</sub> , Ga, V, SiO <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> , Fe <sub>2</sub> O <sub>3</sub> & LOI)	Nos	414 (76x4+110)	2378	58	137924	58	137924
	Sub-Total C					1398264		1750922
	Total A+B+C					3619451		3972109
<b>D</b>	<b>Report Writing</b>	Nos	60000	60000	1	60000	1	60000
	Sub Total					60000		60000
	TOTAL A to D					3679451		4032109
<b>E</b>	<b>GST 18%</b>							725780
	Grand Total : with GST 18%							4757889
								Total IN Lacs
								47.58
Note:								
1	Revised Rates of Promotional Work done by MECL on behalf of Govt. of India Vide letter No. 37(I)/2006-M.I. dated- 02/07/2014 and based on actual escalation as per RBI indices as on 31-03-2017 and the same has been considered for subsequent year.							
2	Phosphorite rates have been considered as there is no rates for Limestone in Revised Rates of Promotional Work of MoM Schedule							
3	**Nityanad Committee Rates with actual escalation as per RBI index as on 31.3.2017 and the same for subsequent year.							
4	*** As approved in the 12th meeting of Technical Committee & th meeting of Executive Committee of NMET.							
5	**** Rate has taken from Schedule of Charges of differen activities of GSI as on 2014-15 and 40% escalation on the same has been considered for FY 2018-19.							

Mineral Exploration and evaluation 18%(SAC Code: 998343)

B.P. RaturiB.P. Raturi  
member secretary  
TCC, NMET

5.6 QUANTUM OF WORK PROPOSED

Table 2: The detail of quantum of proposed work is given below:-

Time Shedule (in month) For exploration programme in Murdadand block, Mainpat plateau distt. Surguja										
Item of work	1	2	3	4	5	6	7	8	9	10
Geological mapping	↔									
Bed rock sampling	↔									
Surveying ( one party)	←	→								
Drilling		←	→							
Survey party for contouring and surface feature	←	→								
Sample preparation		←	→							
Geologist party days for drilling sampling and report work	←	→								
Analytical work Drill core sample		←	→							
Camp winding										
Geological report					←	→				

B.P. Ratan

B.P. Ratan

## Annexure-III

COST ESTIMATE FOR PRELIMINARY EXPLORATION FOR BAUXITE IN DANDKESRA NORTH AREA MAINPAT (G-3) DIST. SURGUJA, CHATTISHGARH								
SL. No.	Item of Work	Unit	Financial Year (2018-19)				Total	
			Base Rate	Esc. Rate	Qty.	Amount	Qty.	Amount
			1.4.90	(Rs)		(Rs)		(Rs)
<b>A</b>	<b>DRILLING</b>							
1	Surface Drilling ( 2 Rigs)	m.	1714	6780	180	1220400	180	1220400
2	Road Making (Flat Terrain)	Km	7800	18563		1220400		1220400
	Sub Total A							
<b>B</b>	<b>GEOLOGICAL WORK</b>							
1	Survey Party Days ( 1 party)	day	1180	5840				
2	Geologist Party days (1 party)	day	1541	7802	10	78020	10	78020
3	Core Sampling Party days(2 parties)	day	525	2809	39	109551	39	109551
	Sub-Total B					187571		187571
<b>C</b>	<b>LABORATORY STUDIES</b>							
	Chemical Analysis							
1	Primary + Check Samples							
	i) for Primary Samples 5 radicals (TiO <sub>2</sub> , Ga.V.SiO <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> , Fe <sub>2</sub> O <sub>3</sub> & LOI)	Nos	414 (76x4+110)	2378	588	1398264	588	1398264
	ii) Analysis of REE	Nos	-	7681	10	76810	10	76810
	iii) for Composit Samples 5 radicals (TiO <sub>2</sub> , Ga.V.SiO <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> , Fe <sub>2</sub> O <sub>3</sub> & LOI)	Nos	414 (76x4+110)	2378	58	137924	58	137924
	iv) for Check Samples 5 radicals (TiO <sub>2</sub> , Ga.V.SiO <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> , Fe <sub>2</sub> O <sub>3</sub> & LOI)	Nos	414 (76x4+110)	2378	58	137924	58	137924
	Sub-Total C					1398264		1750922
	Total A+B+C					2806235		3158893
<b>D</b>	<b>Report Writing</b>	Nos	60000	60000	1	60000	1	60000
	Sub Total					60000		60000
	TOTAL A to D					2866235		3218893
<b>E</b>	<b>GST 18%</b>							579401
	Grand Total : with GST 18%							3798294
								Total IN Lacs
								37.98
Note:								
1	Revised Rates of Promotional Work done by MEC, on behalf of Govt. of India Vide letter No. 37(I)/2006-M.I. dated- 02/07/2014 and based on actual escalation as per RBI indices as on 31-03-2017 and the same has been considered for subsequent year.							
2	Phosphorite rates have been considered as there is no rates for Limestone in Revised Rates of Promotional Work of MoM Schedule							
3	**Nityanad Committee Rates with actual escalation as per RBI index as on 31.3.2017 and the same for subsequent year.							
4	*** As approved in the 12th meeting of Technical Committee & th meeting of Executive Committe of NMET.							
5	**** Rate has taken from Schedule of Charges of differen activities of GSI as on 2014-15 and 40% escalation on the same has been considered for FY 2018-19.							

Mineral Exploration and evaluation 18%(SAC Code: 998343)

B.P. Raturi  
B.P. Raturi  
Member Secretary  
TCC, NMBT

## 5.9 QUANTUM OF WORK PROPOSED

Table No. 1: The detail of quantum of proposed work is given below:-

Time Shedule (in month) For exploration programme in Dandkesra North, Mainpat plateau distt. Surguja										
Item of work	1	2	3	4	5	6	7	8	9	10
Geological mapping	←→									
Bed rock sampling	←→									
Surveying ( one party)	←	→								
Drilling		←	→							
Survey party for contouring and surface feature	←	→								
Sample preparation		←	→							
Geologist party days for drilling sampling and report work	←	→								
Analytical work Drill core sample		←	→							
Camp winding					←	→				
Geological report					←	→				

B.P. Ratan

B.P. Ratan

## Annexure-III

COST ESTIMATE FOR PRELIMINARY EXPLORATION FOR BAUXITE IN PARPATIA AREA MAINPAT (G-3) DIST. SURGUJA, CHATTISHGARH								
SL. No.	Item of Work	Unit	Base	Financial Year (2018-19)			Total	
				Rate	Esc. Rate	Qty.	Amount	Qty.
			1.4.90	(Rs)		(Rs)		(Rs)
<b>A</b>	<b>DRILLING</b>							
1	Surface Drilling ( 2 Rigs)	m	1714	6780	1750	11865000	1750	11865000
2	Road Making (Flat Terrain)	Km	7800	18563				
	Sub Total A					11865000		11865000
<b>B</b>	<b>GEOLOGICAL WORK</b>							
1	Survey Party Days ( 1 party)	day	1180	5840				
2	Geologist Party days ( 1 party)	day	1541	7802	20	156040	20	156040
3	Core Sampling Party days(2 parties)	day	525	2809	382	1073038	382	1073038
	Sub-Total B					1229078		1229078
<b>C</b>	<b>LABORATORY STUDIES</b>							
	<b>Chemical Analysis</b>							
1	Primary + Check Samples							
	(i) for Primary Samples 5 radicals (TiO <sub>2</sub> , Ga.V.SiO <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> , Fe <sub>2</sub> O <sub>3</sub> & LOI)	Nos	414 (76x4+110)	2378	588	1398264	588	1398264
	(ii) Analysis of REE	Nos		7681	10	76810	10	76810
	(iii) for Composit Samples 5 radicals (TiO <sub>2</sub> , Ga.V.SiO <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> , Fe <sub>2</sub> O <sub>3</sub> & LOI)	Nos	414 (76x4+110)	2378	58	137924	58	137924
	(iv) for Check Samples 5 radicals (TiO <sub>2</sub> , Ga.V.SiO <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> , Fe <sub>2</sub> O <sub>3</sub> & LOI)	Nos	414 (76x4+110)	2378	58	137924	58	137924
	Sub-Total C					1398264		1750922
	Total A+B+C					14492342		14845000
<b>D</b>	<b>Report Writing</b>	Nos	175000	175000	1	175000	1	175000
	Sub Total					175000		175000
	TOTAL A to D					14667342		15020000
<b>E</b>	<b>GST 18%</b>							2703600
	Grand Total : with GST 18%							17723600
						Total IN Lacs		177.24
Note:								
1	Revised Rates of Promotional Work done by MECL on behalf of Govt. of India Vide letter No. 37(I)/2006-M.I. dated- 02/07/2014 and based on actual escalation as per RBI indices as on 31-03-2017 and the same has been considered for subsequent year.							
2	Phosphorite rates have been considered as there is no rates for Limestone in Revised Rates of Promotional Work of MoM Schedule of Rates.							
3	**Nityanad Committee Rates with actual escalation as per RBI index as on 31.3.2017 and the same for subsequent year.							
4	*** As approved in the 12th meeting of Technical Committee & th meeting of Executive Committe of NMET.							
5	**** Rate has taken from Schedule of Charges of differen activities of GST as on 2014-15 and 40% escalation on the same has been considered for FY 2018-19.							

Mineral Exploration and evaluation 18%(SAC Code: 998343)

B.P. RaturiB.P. Raturi  
member Secretary  
TCC, NMET

5.9 QUANTUM OF WORK PROPOSED

Table No. 1: The detail of quantum of proposed work is given below:-

Time Schedule (in month) For exploration programme in Parpatia block of Mainpat plateau Surguja district												
Item of work	1	2	3	4	5	6	7	8	9	10	11	12
Geological mapping	↔											
Bed rock sampling	↔											
Surveying ( one party)	←	→										
Drilling		←	→									
Survey party for contouring and surface feature	←	→										
Sample preparation		←	→									
Geologist party days for drilling sampling and report work	←	→										
Analytical work Drill core sample			←	→								
Camp winding								←	→			
Geological report						←	→					

B. P. Ratan

B. P. Ratan

## Annexure-III

COST ESTIMATE FOR PRELIMINARY EXPLORATION OF LIMESTONE IN KHAMARDIH-GATADIH AREA (G-3) DIST. RAIGARH, CHATTISHGARH								
SL. No.	Item of Work	Unit	Base Rate	Financial Year (2018-19)			Total	
				Esc. Rate	Qty.	Amount	Qty.	Amount
			1.4.90	(Rs)		(Rs)		(Rs)
<b>A</b>	<b>GEOLOGICAL WORK</b>					0	0	0
1	Survey Party Days (1 party)	day	1180	5840				
2	Geologist Party days (1 party)	day	1541	7802	50	390100	50	390100
3	Core Sampling Party days(2 parties)	day	525	2809	44	123596	44	123596
	Sub-Total A							
<b>B</b>	<b>DRILLING</b>							
1	Surface Drilling (2 Rigs)	m	1714	6780	240	1627200	240	1627200
2	Road Making (Flat Terrain)	Km	7800	18563		0	0	0
	Sub Total B					1627200		1627200
<b>C</b>	<b>LABORATORY STUDIES</b>							
	<b>Chemical Analysis</b>							
1	Primary - Check Samples							
	i) for 6 radicals (CaO, MgO, SiO <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> , Fe <sub>2</sub> O <sub>3</sub> & LOI)	Nos	490 (76x5+110)	2580	240	619200	240	619200
	ii) Composite Samples (10%) (CaO, MgO, SiO <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> , Fe <sub>2</sub> O <sub>3</sub> , P <sub>2</sub> O <sub>5</sub> & LOI)	Nos	566 (76x6+110)	2982	24	71568	24	71568
	iii) Check Samples (10%)	Nos	566 (76x6+110)	2982	24	71568	24	71568
	Sub-Total C					619200		762336
	Total A+B+C					2760096		2903232
<b>D</b>	<b>Report Writing</b>	Nos	60000	60000	1	60000	1	60000
	Sub Total							
	<b>TOTAL A to D</b>					2820096		2963232
<b>E</b>	<b>GST 18%</b>							533382
	<b>Grand Total : with GST 18%</b>							3496614
							<b>Total IN Lacs</b>	34.97
<b>Note:</b>								
1	Revised Rates of Promotional Work done by MECL on behalf of Govt. of India Vide letter No. 37(I)/2006-M.I. dated- 02/07/2014 and based on actual escalation as per RBI indices as on 31-03-2017 and the same has been considered for subsequent year.							
2	Phosphonite rates have been considered as there is no rates for Limestone in Revised Rates of Promotional Work of MoM Schedule							
3	**Nityanad Committee Rates with actual escalation as per RBI index as on 31.3.2017 and the same for subsequent year.							
4	*** As approved in the 12th meeting of Technical Committee & 1st meeting of Executive Committee of NMET.							
5	**** Rate has taken from Schedule of Charges of differen activities of GSI as on 2014-15 and 40% escalation on the same has been considered for FY 2018-19							

Mineral Exploration and evaluation 18%(SAC Code: 998343)

*B.P. Rautam*  
B.P. Rautam



## Annexure-III

COST ESTIMATE FOR PRELIMINARY EXPLORATION OF LIMESTONE IN KHAIRHA AREA (G-3) DIST. RAIGARH, CHATTISHGARH								
SL. No.	Item of Work	Unit	Base Rate	Financial Year (2018-19)			Total	
				Esc. Rate	Qty.	Amount	Qty.	Amount
			1.4.90	(Rs)		(Rs)		(Rs)
<b>A</b>	<b>GEOLOGICAL WORK</b>							
1	Survey Party Days ( 1 party)	day	1180	5840		0	0	0
2	Geologist Party days (1 party)	day	1541	7802	30	234060	30	234060
3	Core Sampling Party days(2 parties)	day	525	2809	49	137641	49	137641
	Sub-Total A					371701		371701
<b>B</b>	<b>DRILLING</b>							
1	Surface Drilling ( 2 Rigs)	m.	1714	6780	270	1830600	270	1830600
2	Road Making (Flat Terrain)	Km	7800	18563		0	0	0
	Sub Total B					1830600		1830600
<b>C</b>	<b>LABORATORY STUDIES</b>							
	<b>Chemical Analysis</b>							
1	Primary + Check Samples							
	i) for 6 radicals (CaO, MgO, SiO <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> , Fe <sub>2</sub> O <sub>3</sub> & LOI)	Nos	490 (76x5+110)	2580	270	696600	270	696600
	ii) Composite Samples (10%) (CaO, MgO, SiO <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> , Fe <sub>2</sub> O <sub>3</sub> , P <sub>2</sub> O <sub>5</sub> & LOI)	Nos	566 (76x6+110)	2982	27	80514	27	80514
	iii) Check Samples (10%) (CaO, MgO, SiO <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> , Fe <sub>2</sub> O <sub>3</sub> , P <sub>2</sub> O <sub>5</sub> & LOI)	Nos	566 (76x6+110)	2982	27	80514	27	80514
	Sub-Total C					696600		857628
	Total A+B+C					2898901		3059929
<b>D</b>	<b>Report Writing</b>	Nos	60000	60000	1	60000	1	60000
	Sub Total					60000		60000
						0		0
	<b>TOTAL A to D</b>					2958901		3119929
<b>E</b>	<b>GST 18%</b>							561587
	<b>Grand Total : with GST 18%</b>							3681516
								Total IN Lacs
								36.82
Note:								
1	Revised Rates of Promotional Work done by MECL on behalf of Govt. of India Vide letter No. 37(I)/2006-M.I. dated- 02/07/2014 and based on actual escalation as per RBI indices as on 31-03-2017 and the same has been considered for subsequent year.							
2	Phosphonite rates have been considered as there is no rates for Limestone in Revised Rates of Promotional Work of MoM Schedule							
3	**Nityanad Committee Rates with actual escalation as per RBI index as on 31.3.2017 and the same for subsequent year.							
4	*** As approved in the 12th meeting of Technical Committee & th meeting of Executive Committe of NMET.							
5	**** Rate has taken from Schedule of Charges of differen activities of GST as on 2014-15 and 40% escalation on the same has been considered for FY 2018-19.							

Mineral Exploration and evaluation 18%(SAC Code: 998343)

B.P. Ratur  
member secretary, TCC NMET

Table No.3: The detail of quantum of work proposed:-

Time Schedule (in month) For exploration programme in Khairha block, distt. Raigarh												
Item of work	Months											
	1	2	3	4	5	6	7	8	9	10	11	12
Geological mapping	←											
Bed rock sampling	←											
Surveying ( one party)	←	→										
Drilling	←	→										
Survey party for contouring and surface feature		←	→									
Sample preparation	←	→										
Geologist party days for drilling sampling	←	→										
Analytical work	←	→										
Camp binding			←	→								
Geological report	←			→								

*B.P. Pattnaik*  
B.P. Pattnaik

## Annexure-III

COST ESTIMATE FOR RECONNAISSANCE SURVEY FOR IRON ORE IN NORTH BAILADILA AREA (G-4) DIST. RAIGARH, CHATTISHGARH								
Time Schedule								
SL. No.	Item of Work	Unit	Base	Financial Year (2018-19)			Total	
				Rate	Esc. Rate	Qty.	Amount	Qty.
			1.4.90	(Rs)		(Rs)		(Rs)
<b>A</b>	<b>GEOLOGICAL WORK</b>							
1	Survey Party Days ( 1 party)	day	1180	5840		0	0	0
2	Geologist Party days (1 party)	day	1541	7802	100	780200	100	780200
3	Core Sampling Party days(2 parties)	day	525	600	500	300000	500	300000
4	Reconnaissance Geological							
	<b>Sub-Total A</b>					<b>1080200</b>		<b>1080200</b>
<b>B</b>	<b>DRILLING</b>							
1	Drilling iron	m.		9947	500	4973500	500	4973500
2	Road Making (Flat Terrain)	Km	7800	18563		0	0	0
	<b>Sub Total B</b>					<b>4973500</b>		<b>4973500</b>
<b>C</b>	<b>LABORATORY STUDIES</b>							
a	<b>Chemical Analysis</b>							
1	Primary + Check Samples							
	i) for Primary Samples 6 radicals(Fe%, Mn%, SiO <sub>2</sub> %, Al <sub>2</sub> O <sub>3</sub> , P%, S%)	Nos	490 (76x5+110)	2580	500	1290000	500	1290000
	ii) for Composit Samples 6 radicals(Fe%, Mn%, SiO <sub>2</sub> %, Al <sub>2</sub> O <sub>3</sub> , P%, S%)	Nos	490 (76x5+110)	2580	50	129000	50	129000
	iii) for Check Samples 6 radicals(Fe%, Mn% SiO <sub>2</sub> %, Al <sub>2</sub> O <sub>3</sub> , P%, S%.)	Nos	490 (76x5+110)	2580	50	129000	50	129000
	<b>Petrographic Studies</b>							
	Thin Section Preparations	Nos	100	538	10	5380	10	5380
	Polished Section Preparation	Nos	100	538	10	5380	10	5380
	Minerographic Studies	Nos	364	2023	10	20230	10	20230
	<b>Sub-Total C</b>							<b>1578900</b>
	<b>Total A+B+C</b>					<b>6053700</b>		<b>7632690</b>
<b>D</b>	<b>Report Writing</b>	Nos	60000	120000	1	120000	1	120000
	<b>Sub Total</b>					<b>120000</b>		<b>120000</b>
						0		0
	<b>TOTAL A to D</b>					<b>6173700</b>		<b>7752690</b>
<b>E</b>	<b>GST 18%</b>							<b>1395484</b>
	<b>Grand Total : with GST 18%</b>							<b>9148174</b>
						<b>Total IN Lacs</b>		<b>91.48</b>
Note:								
1	Revised Rates of Promotional Work done by MECL on behalf of Govt. of India Vide letter No. 37(I) /2006-M.I. dated- 02/07/2014 and based on actual escalation as per RBI indices as on 31-03-2017 and the same has been considered for subsequent year.							
2	Phosphorite rates have been considered as there is no rates for Limestone in Revised Rates of Promotional Work of MoM Schedule of							
3	**Nityanad Committee Rates with actual escalation as per RBI index as on 31.3.2017 and the same for subsequent year.							
4	*** As approved in the 12th meeting of Technical Committee & th meeting of Executive Committe of NMET.							
5	**** Rate has taken from Schedule of Charges of differen activities of GSI as on 2014-15 and 40% escalation on the same has been considered for FY 2018-19.							

Mineral Exploration and evaluation 18%(SAC Code: 998343)

*Balun*  
B. P. Rauturi

## 10. Quantum of Work Proposed:

Table No. 1: The detail of quantum of proposed work is given below:-

Time Shedule (in month) For exploration programme in North Bailadila area of Dantewada District														
Item of work	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Geological mapping	←													
Drilling		←												
Sample preparation		←												
Geologist party days for drilling sampling and report work	←													
Analytical work Drill core sample			←											
Camp winding										←				
Geological report										←				

*BP-Railin*  
BP-Railin

## Annexure-III

COST ESTIMATE FOR RECONNAISSANCE SURVEY FOR IRON ORE IN HURTARAI AREA (G-4) DIST. KANKER, CHATTISHGARH								
SL. No.	Item of Work	Unit	Base	Financial Year (2018-19)			Total	
				Rate	Esc.Rate	Qty.	Amount	Qty
			1.4.90	(Rs)		(Rs)		(Rs)
<b>A</b>	<b>GEOLOGICAL WORK</b>							
1	Survey Party Days ( 1 party)	day						
2	Geologist Party days (1 party)	day	1541	7802	100	780200	100	780200
3	Core Sampling Party days(2 parties)	day	525	600	400	240000	400	240000
4	Reconnaissance Geological							
	<b>Sub-Total A</b>					<b>1020200</b>		<b>1020200</b>
<b>B</b>	<b>DRILLING</b>							
1	Drilling iron	m.		9947	500	4973500	500	4973500
2	Road Making (Flat Terrain)	Km						
	<b>Sub Total B</b>					<b>4973500</b>		<b>4973500</b>
<b>C</b>	<b>LABORATORY STUDIES</b>							
a	<b>Chemical Analysis</b>							
1	Primary + Check Samples							
	i) for Primary Samples 6 radicals(Fe%, Mn%, Sio2%, Al <sub>2</sub> O <sub>3</sub> , P%, S%)	Nos	490 (76x5+110)	2580	500	1290000	500	1290000
	ii) for Composit Samples 6 radicals(Fe%, Mn%, Sio2%, Al <sub>2</sub> O <sub>3</sub> , P%, S%)	Nos	490 (76x5+110)	2580	50	129000	50	129000
	iii) for Check Samples 6 radicals(Fe%, Mn% Sio2%, Al <sub>2</sub> O <sub>3</sub> , P%, S%,)	Nos	490 (76x5+110)	2580	50	129000	50	129000
	<b>Petrographic Studies</b>							
	Thin Section Preparations	Nos	100	538	10	5380	10	5380
	Polished Section Preparation	Nos	100	538	10	5380	10	5380
	Minerographic Studies	Nos	364	2023	10	20230	10	20230
	<b>Sub-Total C</b>							<b>1578990</b>
	<b>Total A+B+C</b>					<b>5993700</b>		<b>7572690</b>
<b>D</b>	<b>Report Writing</b>	Nos	60000	120000		120000	0	120000
	<b>Sub Total</b>					<b>120000</b>		<b>120000</b>
	<b>TOTAL A to D</b>					<b>6113700</b>		<b>7692690</b>
<b>E</b>	<b>GST 18%</b>							<b>1384684</b>
	<b>Grand Total : with GST 18%</b>							<b>9077374</b>
						<b>Total IN Lacs</b>		<b>90.77</b>
Note:								
1	Revised Rates of Promotional Work done by MECL on behalf of Govt. of India Vide letter No. 37(I) /2006-M.I. dated- 02/07/2014 and based on actual escalation as per RBI indices as on 31-03-2017 and the same has been considered for subsequent year.							
2	Phosphorite rates have been considered as there is no rates for Limestone in Revised Rates of Promotional Work of MoM Schedule							
3	**Nityanad Committee Rates with actual escalation as per RBI index as on 31.3.2017 and the same for subsequent year.							
4	*** As approved in the 12th meeting of Technical Committee & th meeting of Executive Committe of NMET.							
5	**** Rate has taken from Schedule of Charges of differen activities of GSI as on 2014-15 and 40% escalation on the same has been considered for FY 2018-19.							

Mineral Exploration and evaluation 18%(SAC Code: 998343)

Barton

B. P. Barton

Annexure - IX/2

10. Quantum of Work Proposed

Table No. 1: The detail of quantum of proposed work is given below:-

Time Shedule (in month) For exploration programme in Hurtarai area of Kanker District														
Item of work	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Geological mapping	←					→								
Drilling		←						→						
Sample preparation		←							→					
Geologist party days for drilling sampling and report work	←								→					
Analytical work Drill core sample			←									→		
Camp winding										←		→		
Geological report										←			→	

*B.P. Ratan*

B.P. Ratan

## Annexure-III

COST ESTIMATE FOR RECONNAISSANCE SURVEY FOR IRON ORE IN ROWGHAT (G-4) DIST. KANKER, CHATTISHGARH								
SL. No.	Item of Work	Unit	Base	Financial Year (2018-19)			Total	
				Rate	Esc.Rate	Qty.	Amount	Qty
			1.4.90	(Rs)		(Rs)		(Rs)
<b>A</b>	<b>GEOLOGICAL WORK</b>							
1	Geologist Party days (1 party)	day	1541	7802	100	780200	100	780200
2	Core Sampling Party days(2 parties)	day	525	600	400	240000	400	240000
	<b>Sub-Total A</b>					1020200		1020200
<b>B</b>	<b>DRILLING</b>							
1	Drilling iron	m.		9947	500	4973500	500	4973500
	<b>Sub Total B</b>					4973500		4973500
<b>C</b>	<b>LABORATORY STUDIES</b>							
<b>a</b>	<b>Chemical Analysis</b>							
1	Primary + Check Samples							
	i) for Primary Samples 6 radicals(Fe%, Mn%, SiO <sub>2</sub> %, Al <sub>2</sub> O <sub>3</sub> , P%, S%)	Nos	490 (76x5+110)	2580	500	1290000	500	1290000
	ii) for Composit Samples 6 radicals(Fe%, Mn%, SiO <sub>2</sub> %, Al <sub>2</sub> O <sub>3</sub> , P%, S%)	Nos	490 (76x5+110)	2580	50	129000	50	129000
	iii) for Check Samples 6 radicals(Fe%, Mn% SiO <sub>2</sub> %, Al <sub>2</sub> O <sub>3</sub> , P%, S%,)	Nos	490 (76x5+110)	2580	50	129000	50	129000
	<b>Petrographic Studies</b>							
	Thin Section Preparations	Nos	100	538	10	5380	10	5380
	Polished Section Preparation	Nos	100	538	10	5380	10	5380
	Minerographic Studies	Nos	364	2023	10	20230	10	20230
	<b>Sub-Total C</b>							
	<b>Total A+B+C</b>					5993700		7572690
<b>D</b>	<b>Report Writing</b>	Nos	60000	120000	1	120000	1	120000
	<b>Sub Total</b>					120000		120000
	<b>TOTAL A to D</b>					6113700		7692690
<b>E</b>	<b>GST 18%</b>							1384684
	<b>Grand Total : with GST 18%</b>							9077374
						<b>Total IN Lacs</b>		90.77
Note:								
1	Revised Rates of Promotional Work done by MECL on behalf of Govt. of India Vide letter No. 37(l) /2006-M.I. dated- 02/07/2014 and based on actual escalation as per RBI indices as on 31-03-2017 and the same has been considered for subsequent year.							
2	Phosphorite rates have been considered as there is no rates for Limestone in Revised Rates of Promotional Work of MoM Schedule							
3	**Nityanad Committee Rates with actual escalation as per RBI index as on 31.3.2017 and the same for subsequent year.							
4	*** As approved in the 12th meeting of Technical Committee & th meeting of Executive Committe of NMET.							
5	**** Rate has taken from Schedule of Charges of differen activities of GSI as on 2014-15 and 40% escalation on the same has been considered for FY 2018-19.							

Mineral Exploration and evaluation 18%(SAC Code: 998343)

*BSP. Baturin*

## 10. Quantum of Work Proposed

Table No. 1: The detail of quantum of proposed work is given below:-

Time Shedule (in month) For exploration programme in Rowghat (Notified area) of Kanker District														
Item of work	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Geological mapping		←					→							
Drilling		←							→					
Sample preparation		←							→					
Geologist party days for drilling sampling and report work	←								→					
Analytical work Drill core sample			←									→		
Camp winding									←			→		
Geological report									←			→		

Ratum

Bp. Ratum

## Annexure-III

COST ESTIMATE FOR RECONNAISSANCE SURVEY FOR IRON ORE IN Rajhara (G-4) DIST. BALOD, CHATTISHGARH								
SL. No.	Item of Work	Unit	Base	Financial Year (2018-19)			Total	
				Rate	Esc. Rate	Qty.	Amount	Qty.
			1.4.90	(Rs)		(Rs)		(Rs)
<b>A</b>	<b>GEOLOGICAL WORK</b>							
1	Survey Party Days ( 1 party)	day	1180	5840				
2	Geologist Party days (1 party)	day	1541	7802	100	780200	100	780200
3	Core Sampling Party days(2 parties)	day	525	600	500	300000	500	300000
4	Reconnaissance Geological							
	<b>Sub-Total A</b>					<b>1080200</b>		<b>1080200</b>
<b>B</b>	<b>DRILLING</b>							
1	Drilling iron	m.		9947	500	4973500	500	4973500
2	Road Making (Flat Terrain)	Km	7800	18563				
	<b>Sub Total B</b>					<b>4973500</b>		<b>4973500</b>
<b>C</b>	<b>LABORATORY STUDIES</b>							
a	<b>Chemical Analysis</b>							
1	Primary + Check Samples							
	i) for Primary Samples 6 radicals(Fe%, Mn%, SiO <sub>2</sub> %, Al <sub>2</sub> O <sub>3</sub> %, P%, S%)	Nos	490 (76x5+110)	2580	500	1290000	500	1290000
	ii) for Composit Samples 6 radicals(Fe%, Mn%, SiO <sub>2</sub> %, Al <sub>2</sub> O <sub>3</sub> %, P%, S%)	Nos	490 (76x5+110)	2580	50	129000	50	129000
	iii) for Check Samples 6 radicals(Fe%, Mn% SiO <sub>2</sub> %, Al <sub>2</sub> O <sub>3</sub> %, P%, S%.)	Nos	490 (76x5+110)	2580	50	129000	50	129000
	<b>Petrographic Studies</b>							
	Thin Section Preparations	Nos	100	538	10	5380	10	5380
	Polished Section Preparation	Nos	100	538	10	5380	10	5380
	Minerographic Studies	Nos	364	2023	10	20230	10	20230
	<b>Sub-Total C</b>							<b>1578990</b>
	<b>Total A+B+C</b>					<b>6053700</b>		<b>7632690</b>
<b>D</b>	<b>Report Writing</b>	Nos	60000	120000	1	120000	1	120000
	<b>Sub Total</b>					<b>120000</b>		<b>120000</b>
	<b>TOTAL A to D</b>					<b>6173700</b>		<b>7752690</b>
<b>E</b>	<b>GST 18%</b>							<b>1395484</b>
	<b>Grand Total : with GST 18%</b>							<b>9148174</b>
						<b>Total IN Lacs</b>		<b>91.48</b>
Note:								
1	Revised Rates of Promotional Work done by MECL on behalf of Govt. of India Vide letter No. 37(I)/2006-M.I. dated- 02/07/2014 and based on actual escalation as per RBI indices as on 31-03-2017 and the same has been considered for subsequent year.							
2	Phosphorite rates have been considered as there is no rates for Limestone in Revised Rates of Promotional Work of MoM Schedule							
3	**Nityanad Committee Rates with actual escalation as per RBI index as on 31.3.2017 and the same for subsequent year.							
4	*** As approved in the 12th meeting of Technical Committee & th meeting of Executive Committe of NMET.							
5	**** Rate has taken from Schedule of Charges of differen activities of GSI as on 2014-15 and 40% escalation on the same has been considered for FY 2018-19.							

Mineral Exploration and evaluation 18%(SAC Code: 998343)

*Balrao*  
*B.P. Rautan*  
*B.P. Rautan*  
 member secretary  
 TCC, NMET

Table No. 1: The detail of quantum of proposed work is given below:-

Time Shedule (in month) For exploration programme in Dallirajhara area of Balod District														
Item of work	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Geological mapping	←	→												
Drilling		←	→	→	→	→	→	→	→					
Sample preparation		←	→	→	→	→	→	→	→					
Geologist party days for drilling sampling and report work	←	→							→					
Analytical work Drill core sample			←	→	→	→	→	→	→	→	→	→		
Camp winding										←	→			
Geological report										←	→	→		

Table No. 2: proposed quantum of work in Dallirajhara area district Balod, Chhattisgarh

B.P. Rath

B.P. Rath

## Annexure-III

COST ESTIMATE FOR RECONNAISSANCE SURVEY FOR IRON ORE IN SALHEWARA (G-4) DIST. RAJNANDGAON, CHATTISHGARH								
SL. No.	Item of Work	Unit	Base	Financial Year (2018-19)			Total	
				Rate	Esc. Rate	Qty.	Amount	Qty.
			1.4.90	(Rs)		(Rs)		(Rs)
<b>A</b>	<b>GEOLOGICAL WORK</b>							
1	Survey Party Days ( 1 party)	day	1180	5840		0	0	0
2	Geologist Party days (1 party)	day	1541	7802	100	780200	100	780200
3	Core Sampling Party days(2 parties)	day	525	600	500	300000	500	300000
4	Reconnaissance Geological							
	<b>Sub-Total A</b>					<b>1080200</b>		<b>1080200</b>
<b>B</b>	<b>DRILLING</b>							
1	Drilling iron	m.		9947	500	4973500	500	4973500
2	Road Making (Flat Terrain)	Km	7800	18563		0	0	0
	<b>Sub Total B</b>					<b>4973500</b>		<b>4973500</b>
<b>C</b>	<b>LABORATORY STUDIES</b>							
<b>a</b>	<b>Chemical Analysis</b>							
1	Primary + Check Samples							
	i) for Primary Samples 6 radicals(Fe%, Mn%, SiO <sub>2</sub> %, Al <sub>2</sub> O <sub>3</sub> %, P%, S%)	Nos	490 (76x5+110)	2580	500	1290000	500	1290000
	ii) for Composit Samples 6 radicals(Fe%, Mn%, SiO <sub>2</sub> %, Al <sub>2</sub> O <sub>3</sub> %, P%, S%)	Nos	490 (76x5+110)	2580	50	129000	50	129000
	iii) for Check Samples 6 radicals(Fe%, Mn%, SiO <sub>2</sub> %, Al <sub>2</sub> O <sub>3</sub> %, P%, S%.)	Nos	490 (76x5+110)	2580	50	129000	50	129000
	<b>Petrographic Studies</b>							
	Thin Section Preparations	Nos	100	538	10	5380	10	5380
	Polished Section Preparation	Nos	100	538	10	5380	10	5380
	Minerographic Studies	Nos	364	2023	10	20230	10	20230
	<b>Sub-Total C</b>							<b>1578990</b>
	<b>Total A+B+C</b>					<b>6053700</b>		<b>7632690</b>
<b>D</b>	<b>Report Writing</b>	<b>Nos</b>	<b>60000</b>	<b>120000</b>	<b>1</b>	<b>120000</b>	<b>1</b>	<b>120000</b>
	<b>Sub Total</b>					<b>120000</b>		<b>120000</b>
	<b>TOTAL A to D</b>					<b>6173700</b>		<b>7752690</b>
<b>E</b>	<b>GST 18%</b>							<b>1395484</b>
	<b>Grand Total : with GST 18%</b>							<b>9148174</b>
						<b>Total IN Lacs</b>		<b>91.48</b>
Note:								
1	Revised Rates of Promotional Work done by MECL on behalf of Govt. of India Vide letter No. 37(I)/2006-M.I. dated- 02/07/2014 and based on actual escalation as per RBI indices as on 31-03-2017 and the same has been considered for subsequent year.							
2	Phosphorite rates have been considered as there is no rates for Limestone in Revised Rates of Promotional Work of MoM Schedule							
3	**Nityanad Committee Rates with actual escalation as per RBI index as on 31.3.2017 and the same for subsequent year.							
4	*** As approved in the 12th meeting of Technical Committee & th meeting of Executive Committe of NMET.							
5	**** Rate has taken from Schedule of Charges of differen activities of GSI as on 2014-15 and 40% escalation on the same has been considered for FY 2018-19.							

Mineral Exploration and evaluation 18%(SAC Code: 998343)

*B.P. Rautan*  
B.P. Rautan

## 8. Quantum of Work Proposed

The details of Quantum of proposed work are given below:-

Table No. 1: The detail of quantum of proposed work is given below:-

Time Schedule (in month) Preliminary Survey from Iron ore Salhewara area of Rajnandgaon District														
Item of work	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Geological mapping	←					→								
Drilling		←							→					
Sample preparation		←							→					
Geologist party days for drilling sampling and report work	←								→					
Analytical work Drill core sample			←									→		
Camp winding										←		→		
Geological report										←		→		

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Annexure - XIII/1

## Annexure-III

COST ESTIMATE FOR RECONNAISSANCE SURVEY FOR IRON ORE NARAYANAPUR (G-4) DIST. NARAYANAPUR, CHATTISHGARH								
SL. No.	Item of Work	Unit	Financial Year (2018-19)				Total	
			Base Rate	Esc. Rate	Qty.	Amount	Qty	Amount
			1.4.90	(Rs)		(Rs)		(Rs)
<b>A</b>	<b>GEOLOGICAL WORK</b>							
1	Survey Party Days ( 1 party)	day	1180	5840		0	0	0
2	Geologist Party days (1 party)	day	1541	7802	100	780200	100	780200
3	Core Sampling Party days(2 parties)	day	525	600	550	330000	550	330000
						0	0	0
	<b>Sub-Total A</b>					<b>1110200</b>		<b>1110200</b>
<b>B</b>	<b>DRILLING</b>							
1	Surface Drilling ( 2 Rigs)	m.	1714	6780	500	3390000	500	3390000
2	Road Making (Flat Terrain)	Km	7800	18563		0	0	0
								0
	<b>Sub Total B</b>					<b>3390000</b>		<b>3390000</b>
<b>C</b>	<b>LABORATORY STUDIES</b>							
<b>a</b>	<b>Chemical Analysis</b>							
1	Primary + Check Samples							
	i) for Primary Samples 6 radicals(Fe%, Mn%, SiO <sub>2</sub> %, Al <sub>2</sub> O <sub>3</sub> %, P%, S%)	Nos	490 (76x5+110)	2580	500	1290000	500	1290000
	ii) for Composit Samples 6 radicals(Fe%, Mn%, SiO <sub>2</sub> %, Al <sub>2</sub> O <sub>3</sub> %, P%, S%)	Nos	490 (76x5+110)	2580	50	129000	50	129000
	iii) for Check Samples 6 radicals(Fe%, Mn% SiO <sub>2</sub> %, Al <sub>2</sub> O <sub>3</sub> %, P%, S%)	Nos	490 (76x5+110)	2580	50	129000	50	129000
	<b>Petrographic Studies</b>							
	Thin Section Preparations	Nos	100	538	10	5380	10	5380
	Polished Section Preparation	Nos	100	538	10	5380	10	5380
	Minerographic Studies	Nos	364	2023	10	20230	10	20230
	<b>Sub-Total C</b>							<b>1578990</b>
	<b>Total A+B+C</b>					<b>4500200</b>		<b>6079190</b>
<b>D</b>	<b>Report Writing</b>	<b>Nos</b>	<b>60000</b>	<b>120000</b>	<b>1</b>	<b>120000</b>	<b>1</b>	<b>120000</b>
	<b>Sub Total</b>					<b>120000</b>		<b>120000</b>
	<b>TOTAL A to D</b>							<b>6199190</b>
<b>E</b>	<b>GST 18%</b>							<b>1115854</b>
	<b>Grand Total : with GST 18%</b>							<b>7315044</b>
						<b>Total IN Lacs</b>		<b>73.15</b>
Note:								
1	Revised Rates of Promotional Work done by MECL on behalf of Govt. of India Vide letter No. 37(I) /2006-M.I. dated- 02/07/2014 and based on actual escalation as per RBI indices as on 31-03-2017 and the same has been considered for subsequent year.							
2	Phosphorite rates have been considered as there is no rates for Limestone in Revised Rates of Promotional Work of MoM Schedule							
3	**Nityanad Committee Rates with actual escalation as per RBI index as on 31.3.2017 and the same for subsequent year.							
4	*** As approved in the 12th meeting of Technical Committee & th meeting of Executive Committe of NMET.							
5	**** Rate has taken from Schedule of Charges of differen activities of GSI as on 2014-15 and 40% escalation on the same has been considered for FY 2018-19.							

Mineral Exploration and evaluation 18%(SAC Code: 998343)

*B.P. Ratan*  
B.P. Ratan

## 10. Quantum of Work Proposed:

Table No. 1: The detail of quantum of proposed work is given below:-

Time Shedule (in month) For exploration programme in Iron Ore in Narayanpur (Notified area) of Narayanpur District														
Item of work	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Geological mapping	←													
Drilling		←												
Sample preparation		←												
Geologist party days for drilling sampling and report work	←													
Analytical work Drill core sample			←											
Camp winding														
Geological report										←				
										←				

NMET/Iron/Narayanpur/Nagpur/21.05.2018

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## Annexure-III

COST ESTIMATE FOR RECONNAISSANCE SURVEY FOR IRON ORE NOTIFIED AREA (G-4) DIST. KANKER, CHHATTISHGARH								
SL. No.	Item of Work	Unit	Financial Year (2018-19)				Total	
			Base Rate	Esc. Rate	Qty.	Amount	Qty	Amount
			1.4.90	(Rs)		(Rs)		(Rs)
<b>A</b>	<b>GEOLOGICAL WORK</b>							
1	Survey Party Days ( 1 party)	day	1180	5840				
2	Geologist Party days (1 party)	day	1541	7802	100	780200	100	780200
3	Core Sampling Party days(2 parties)	day	525	600	400	240000	400	240000
						0	0	0
	<b>Sub-Total A</b>					<b>1020200</b>		<b>1020200</b>
<b>B</b>	<b>DRILLING</b>							
1	Surface Drilling ( 2 Rigs)	m.	1714	6780	400	2712000	400	2712000
2	Road Making (Flat Terrain)	Km	7800	18563				
	<b>Sub Total B</b>					<b>2712000</b>		<b>2712000</b>
<b>C</b>	<b>LABORATORY STUDIES</b>							
<b>a</b>	<b>Chemical Analysis</b>							
1	Primary + Check Samples							
	i) for Primary Samples 6 radicals(Fe%, Mn%, SiO <sub>2</sub> %, Al <sub>2</sub> O <sub>3</sub> %, P%, S%)	Nos	490 (76x5+110)	2580	500	1290000	500	1290000
	ii) for Composit Samples 6 radicals(Fe%, Mn%, SiO <sub>2</sub> %, Al <sub>2</sub> O <sub>3</sub> %, P%, S%)	Nos	490 (76x5+110)	2580	50	129000	50	129000
	iii) for Check Samples 6 radicals(Fe%, Mn% SiO <sub>2</sub> %, Al <sub>2</sub> O <sub>3</sub> %, P%, S%,)	Nos	490 (76x5+110)	2580	50	129000	50	129000
	<b>Petrographic Studies</b>							
	Thin Section Preparations	Nos	100	538	10	5380	10	5380
	Polished Section Preparation	Nos	100	538	10	5380	10	5380
	Minerographic Studies	Nos	364	2023	10	20230	10	20230
	<b>Sub-Total C</b>					<b>1290000</b>		<b>1578990</b>
	<b>Total A+B+C</b>					<b>5022200</b>		<b>5311190</b>
<b>D</b>	<b>Report Writing</b>	Nos	60000	74644	1	74644	1	74644
	<b>Sub Total</b>					<b>74644</b>		<b>74644</b>
	<b>TOTAL A to D</b>					<b>5096844</b>		<b>5385834</b>
<b>E</b>	<b>GST 18%</b>							<b>969450</b>
	<b>Grand Total : with GST 18%</b>							<b>6355284</b>
							<b>Total IN Lacs</b>	<b>63.55</b>
Note:								
1	Revised Rates of Promotional Work done by MECL on behalf of Govt. of India Vide letter No. 37(i) /2006-M.I. dated- 02/07/2014 and based on actual escalation as per RBI indices as on 31-03-2017 and the same has been considered for subsequent year.							
2	Phosphorite rates have been considered as there is no rates for Limestone in Revised Rates of Promotional Work of MoM Schedule							
3	**Nityanad Committee Rates with actual escalation as per RBI index as on 31.3.2017 and the same for subsequent year.							
4	*** As approved in the 12th meeting of Technical Committee & th meeting of Executive Committe of NMET.							
5	**** Rate has taken from Schedule of Charges of differen activities of GSI as on 2014-15 and 40% escalation on the same has been considered for FY 2018-19.							

Mineral Exploration and evaluation 18%(SAC Code: 998343)

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B.P. Batum

## 10. Quantum of Work Proposed

Table No. 1: The detail of quantum of proposed work is given below:-

Time Shedule (in month) For exploration programme in Iron Ore in <del>Atur</del> bedu area of Kanker District Notified														
Item of work	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Geological mapping		←					→							
Drilling			←							→				
Sample preparation			←							→				
Geologist party days for drilling sampling and report work		←								→				
Analytical work Drill core sample				←									→	
Camp winding										←		→		
Geological report										←			→	

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B.P. Batum

## Annexure-III

COST ESTIMATE FOR RECONNAISSANCE SURVEY FOR IRON ORE ATURBEDA AREA (G-4) DIST. KANKER, CHHATTISHGARH								
SL. No.	Item of Work	Unit	Base	Financial Year (2018-19)			Total	
				Rate	Esc. Rate	Qty.	Amount	Qty.
			1.4.90	(Rs)		(Rs)		(Rs)
<b>A</b>	<b>GEOLOGICAL WORK</b>							
1	Survey Party Days ( 1 party)	day	1180	5840				
2	Geologist Party days (1 party)	day	1541	7802	100	780200	100	780200
3	Core Sampling Party days(2 parties)	day	525	600	400	240000	400	240000
	<b>Sub-Total A</b>					<b>1020200</b>		<b>1020200</b>
<b>B</b>	<b>DRILLING</b>							
1	Surface Drilling ( 2 Rigs)	m.	1714	6780				
2	Road Making (Flat Terrain)	Km	7800	18563				
3	Drilling iron	m.		9947	400	3978800	400	3978800
	<b>Sub Total B</b>					<b>3978800</b>		<b>3978800</b>
<b>C</b>	<b>LABORATORY STUDIES</b>							
<b>a</b>	<b>Chemical Analysis</b>							
1	Primary + Check Samples							
	i) for 6 radicals (CaO, MgO, SiO <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> , Fe <sub>2</sub> O <sub>3</sub> & LOI)	Nos	490 (76x5+110)	2580	500	1290000	500	1290000
	ii) for Composit Samples 6 radicals(Fe%, Mn%, SiO <sub>2</sub> %, Al <sub>2</sub> O <sub>3</sub> %, P%, S%)	Nos	490 (76x5+110)	2580	50	129000	50	129000
	iii) for Check Samples 6 radicals(Fe%, Mn% SiO <sub>2</sub> %, Al <sub>2</sub> O <sub>3</sub> %, P%, S%.)	Nos	490 (76x5+110)	2580	50	129000	50	129000
	<b>Petrographic Studies</b>							
	Thin Section Preparations	Nos	100	538	10	5380	10	5380
	Polished Section Preparation	Nos	100	538	10	5380	10	5380
	Minerographic Studies	Nos	364	2023	10	20230	10	20230
	<b>Sub-Total C</b>					<b>1290000</b>		<b>1578990</b>
	<b>Total A+B+C</b>					<b>6289000</b>		<b>6577990</b>
<b>D</b>	<b>Report Writing</b>	Nos	60000	131559.8	1	131559.8	1	131560
	<b>Sub Total</b>					<b>131560</b>		<b>131560</b>
	<b>TOTAL A to D</b>					<b>6420560</b>		<b>6709550</b>
<b>E</b>	<b>GST 18%</b>							<b>1207719</b>
	<b>Grand Total : with GST 18%</b>							<b>7917269</b>
						<b>Total IN Lacs</b>		<b>79.17</b>
Note:								
1	Revised Rates of Promotional Work done by MECL on behalf of Govt. of India Vide letter No. 37(I)/2006-M.I. dated- 02/07/2014 and based on actual escalation as per RBI indices as on 31-03-2017 and the same has been considered for subsequent year.							
2	Phosphorite rates have been considered as there is no rates for Limestone in Revised Rates of Promotional Work of MoM Schedule							
3	**Nityanad Committee Rates with actual escalation as per RBI index as on 31.3.2017 and the same for subsequent year.							
4	*** As approved in the 12th meeting of Technical Committee & th meeting of Executive Committe of NMET.							
5	**** Rate has taken from Schedule of Charges of differen activities of GSI as on 2014-15 and 40% escalation on the same has been considered for FY 2018-19.							

Mineral Exploration and evaluation 18%(SAC Code: 998343)

B.P. Raturi

B.P. Raturi

## 10. Quantum of Work Proposed

Table No. 1: The detail of quantum of proposed work is given below:-

Time Schedule (in month) For exploration programme in Iron Ore in Aturbeda area of Kanker District														
Item of work	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Geological mapping	←													
Drilling		←												
Sample preparation		←												
Geologist party days for drilling sampling and report work	←													
Analytical work Drill core sample			←											
Camp winding														
Geological report														

Barton

B.P. Barton