

ORI-06

**FINAL REPORT FOR RP  
NO.75 AREA 128.06 SQ.KM.  
IN BOLANGIR DISTRICT OF  
ORISSA**

**REPORTS FROM 19<sup>TH</sup>  
FEBRUARY 2005 TO 18<sup>TH</sup>  
FEBRUARY 2008.**

# **FINAL REPORT OF R. P. NO.75 AREA 128.06 SQ. KM.**

**FROM 19.02.2005 TO 18.02.2008.**

## **CHAPTER – I**

### **Introduction:-**

With a view to search for primary source of diamond, precious stones including metals and minerals, the area of 128.06 Sq. Km. on the Bolangir district was targeted under R.P. No. 75 for quick appraisal from geological point of view. Then area was put to the general forms of exploration as practiced elsewhere in the world, so as to identify the positive areas and discard the negative blocks. The area was selected on the strong geological background that the block belongs to the eastern Bhandara Craton, which have been stabilised since long and ideal place for searching kimberelite/Lamponite. Besides the area has not been investigated prior to this for search of precious minerals, metals and stones. The report highlights the geological activities undertaken during the period from 19.02.2005 to 18.02.2008, undertaken in the R.P. block of 128.06 sq. km. During February 2007 an area of 64.66 sq. Km. has been relinquished and retained an area of 63.40 Sq. Km. The entire RP area of 128.06 Sq. Km. has been surrendered in the month of August 2007.

### **1.1 Location:-**

The area of R.P. No. 75 is featured in Toposheet No. 64L/13. The block is bounded by parallels of  $82^{\circ} 53' 29''$  &  $82^{\circ} 58' 28''$  E and  $20^{\circ} 47' 22''$  &  $20^{\circ} 53' 52''$  N. The area comes under the administrative control of Khaparakhhol Block of Patnagarh sub-division of Bolangir district. It is approachable from Bolangir over 84 kms of mixed black top and metalled road.

## 1.2 Accessibility:-

The area lies to the north-west of Bolangir district Head quarters and approachable over a distance of 84 kms. The area inside the R.P. block is accessible during dry season, but restricted during rainy season as road network is poor. The nearest town is Patnagarh or Kantabanji and the nearest rail head is Lakhana (Harishankar Road) on Bolangir- Raipur Rly. Line.

## 1.3 Geomorphology:-

The area represents a part of the foot hills of Gandhamardan Hill range system. A moderate sloping feature is observed from north to south, and in general rolling topography is observed. North part is covered by lofty Gandhamardan Hill range where as the southern part opens to a valley system.

## 1.4 Drainage:-

The drainage system developed in the area is dendritic to semi-trellis pattern. The creeks developed in the area are of 1<sup>st</sup>, & 2<sup>nd</sup> order. A few 3<sup>rd</sup> order drainage systems are observed. The creeks are remaining dry except in rainy season.

The annual rain is affected by southwest monsoon prevailing from mid June to early part of October. The average annual rainfall is recorded as 1500mm. The forest growth around the area is moderate having mostly dry deciduous vegetation.

#### **1.5 Previous Work:-**

The area has been covered by offices of G.S.I. for preparation of geological map in 1:63.360 scale, and the area is classified into Eastern Ghats Super Group of Pre- Cambrian age. Occurrences of bauxite and graphite are recorded. Following this officers from state DGM (O) have undertaken investigation for bauxite and graphite. No agencies have reported the occurrence of kimberelite or any other precious minerals or metals.

#### **1.6 Scope of Work:-**

The main objective of the exploration was to identify positive area through regional exploration measures for detailed search of diamond bearing kimberelite and other precious minerals and metals.

## CHAPTER – II

### 2.0 Geology:-

The area under report presents an integral part of the Bhandara Craton shield of stabilized Archon. Archon is a possible source of kimberlite intrusion. The area representing cratonic block is having a thrust contact with the Eastern Ghats.

The area in general is a part of Gandhamardan Hill system with wide open rolling valleys. The hill is occupied by Khondalite, Charnockite rock types, where as the valley is occupied by gneissic rocks of granite clan, basic intrusive, pegmatites and quartz veins. Poly phase granitic activities have produced gneissic rocks are intruded by younger grey granites, pegmatoids, and pegmatites. Occurrence of quartz veins are very common in the area.

The general trend of the litho-assemblage is recorded along NE-SW direction dipping steeply towards south. Two sets of joint planes are observed along NW-SE, NE-SW direction. Less developed E-W trending joints are seen. These joint planes have allowed to develop the semi-trellis pattern drainage system. Graphite mineralization are often marked in the mafic bands of khondalite, whose contact is with migmatite and gneissic rocks.

The generalized stratigraphic sequence of the area can be stated as below:

	Recent – Soil & alluvium	
	Tertiary – Laterite/Bauxite	
Pre Cambrian	Eastern Ghat Super Group	Quartz Vein Pegmatite Younger granite Basic rocks Khondalite Charnockite Quartzite
	Archaean..... older Metamorphites	

All the lithounits of the area have been disturbed due to tectonic movement.

## CHAPTER – III

### 3. Exploration:-

Systematic and meticulous gravel sampling with some loam samples were collected from 1<sup>st</sup> & 2<sup>nd</sup> order creeks having country rock bares and pebble beds as trap site locations. The sampling density was such that each part of the R.P. block was covered under area of influence method. The following is the total quantum of work done during the period under report.

- |    |                  |   |                      |
|----|------------------|---|----------------------|
| a) | Gravel sample    | - | 22 nos.              |
| b) | Loam sample      | - | 8 nos.               |
| c) | Follow-up sample | - | 5 nos.               |
| d) | Ground check-up  | - | 8 kms traverse line. |

Gravel samples were lifted to the tune of 22 nos from the 1<sup>st</sup> & 2<sup>nd</sup> order creeks. The sample weight around 40-45 kgs confirming to (-) 1.5 mm size. Care was taken to touch the bedrock, but failed to do so due to thick soil profile. The samples collected are admixed with about 30% silt. The associated boulders, pebbles are sub angular to sub-rounded and are mostly khondalites and granites. As such 22 nos. of samples were collected for processing and observation. In the absence of good trap sites, 8 nos. of loam samples were collected from the depressional sites. Follow-up samples numbering to 5 nos. were collected for processing, which weighed around 50 kgs for each sample.

Cross traverses were made along NW-SE directions to scan each litho exposures for recording petrological data. It has been observed that the heavy concentrates processed out of 40 kgs of gravel and loam samples do carry large nos of ilmenite, rutile, garnet and magnetites. But these are creustal derivatives. Each sample generate about more than 100 gms of heavy concentrates, but incidence of positive DIM grains found to be nil. Since occurrence of Kimberlite/Lamproit rocks have not been found no further investigation was recommended.

The expenditure was incurred during the period from 19.2.05 to 18.8.07 as attached as annexure - 1.