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JHK-1

Closure Report of Reconnaissance Permit Mining/ RP 39/02/108/M Jharkhand

Report for the period
05/04/08 to 17/08/10

1. Reconnaissance Permit (RP) Status

The RP is 2061 km^2 in extent and was executed at Ranchi on 5th April 2008. As per rule 7(i) (a) of MCR 1960, it was scheduled to be reduced by 50% on or before 4th April 2010. On 4th April 2010 an area of 1084 km^2 was relinquished and an area of 977 km^2 was retained (Map 1). On 17th August 2010, complete RP area has been relinquished. This report summarizes the exploration work carried out in the permit area from 5th April 2008 to 17th August 2010.

2. Geology and Geomorphology

The RP area lies in the Chhotanagpur Gniessic Complex and at places is covered by older laterites in the western portions and Holocence soils derived from Deccan lavas (?) in the eastern portions of the RP area.

Regionally the area lies in north extension of Singhbhum craton in the Satpura mobile belt (Central India Tectonic zone). Singhbhum craton covers a triangular area of 50,000 sq km and consists of a core Singhbhum granite, rimmed by supracrustals of varied character and age. The acrcuate North Singhbhum orogen wraps round Singhbhum granite in the north. The well known Singhbhum Copper Belt shear zone occurs in the northern margin of North Singhbhum orogen. Singhbhum craton is bounded in the north by the Chhotanagpur Gneiss, forming the eastern extension of the Satpura mobile belt or Central Indian Tectonic Zone (CITZ). The craton
is separated from the Satpura mobile belt by the Tamar-Proropahar (or South Purulia) shear zone. In the south, the craton is bounded by the Eastern Ghats mobile belt with a tectonic contact marked by the Sukinda shear zone. In the east, the craton is covered under the alluvium of Bengal basin. Singhbhum craton is also called in Literature as Singhbhum-Orissa craton or Singhbhum Iron Ore craton, but the name Singhbhum craton is widely used.

Chhotanagpur Gneissic Complex, (CGC) covers a vast area of 500 km long and 200 km wide in the eastern India. CGC is bounded to the south by Tamar-Poropahar (or South Purulia) shear zone (TPSZ) separating it from the North Singhbhum orogen occurring to the north of Singhbhum craton. CGC is bounded to the north by the Indo-Gangetic alluvium and the east by the Rajmahal Trap and Bengal basin. In the west it is separated from the

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CITZ by the Mahanadi Gondwana graben. CGC, together with the CITZ, the eastern Aravalli craton (Mewar craton) and the Shillong (Meghalaya) Plateau of the North East India, form part of the composite Satpura mobile belt.

Chhotanagpur Gneiss is an E-W trending gneissic terrain with a variety of gneisses and younger granites, widespread but narrow belts of supracrustal enclaves, discontinuous boudin-type granulite belts and major parallel shear zones. The geological setting is therefore the easterly extension of the CITZ beyond the Mahanadi Gondwana graben. Reviews of this terrain are found in Banerjee (1991), Ghose (1992), Mazumder (1988, 1996), Singh (1998), Ghose and Mukherjee (2000), Acharayya (2001, 2003) and Mahadevan (2002). The earlier classifications treated it as a single composite terrain like a craton and provided a unified stratigraphy. The realization that CITZ is divided into several parallel E-W trending lithotectonic units separated by crustal scale shear zones and boudin-type granulite belts, and that similar geological setting continues into the CGC beneath the younger cover sediments, requires that the stratigraphic scheme have to be formulated differently in terms of parallel E-W trending belts described by Acharayya (2001) and Mahadevan (2002) and integrated with North Singhbhum Orogen (NSO). The large gaps in continuity between CGC and CITZ due to extensive younger cover cause formidable problem of regional Precambrian correlation. Further, the numerous sub-parallel faults, shear zones with granulite lenses and boudins along the composite Satpura mobile belt make the one to one correspondence difficult, if not impossible.

Most of the western parts of RP area specially the watershed of Sankh River are mapped as granites (possible Syntectonic?), while the western central portions of RP area (mainly the catchments of North Koel River) show variable thickness of very old (Cretaceous - Paleogene?) laterite profiles. The eastern parts of RP area has recent residual soil patches derived from Deccan lavas (?) of variable thickness with Chhotanagpur Gneisses exposed at places.

The RP area straddles the watershed between the Sankh river (in western portion of RP flowing southeast), North Koel river (in western central portion of RP flowing north-northwest), South Koel river (in central eastern portion of RP flowing southeast) and Lohara Nala (in eastern portion of RP flowing southeast) (Map 3).). It is well-drained and in spite of residual soil (laterite) cover at many places, the area is largely suited to heavy mineral stream sampling in most areas. Drainage is controlled at places by a north east and north west trending joint pattern.

3. Activity during the period from 5th April 08 to 17th August 2010

3.1 Pre-field operations

Purchase of topo sheets (on 1:50000 scale) for the license area from the Survey of India and converting them into digital form.

Study of Land sat TM data and production of digital images.
Mobilisation of vehicles, laptop computers and other field equipment
Training of geologists and field drivers for sampling in different geomorphological terrain

3.2 Reconnaissance Sampling

Reconnaissance sampling is done only in the non forest areas and in safe areas not infested by naxallites. The stream sampling was planned to be collected with a proposed density of one sample in every 30 to 40 sq km. Stream sample sites were first planned on the map and then the sites were selected in field after examining the stream bed for about one km searching for the best available trap site. Stream sediments (gravels) were collected to produce at least a minimum of 60 to 120 lt of – 2 mm fraction material depending upon the quality of trap site. A total of 35 reconnaissance samples were collected in the RP area excluding forest area (Map 4 & Table 1).

The samples were sent to the Peenya Sample Treatment Center in Bangalore and the concentrates were consigned to the De Beers Centurian Lab, in RSA for further processing and sorting.

3.3 Reconnaissance Sampling Visual Results

Results were received for all the 35 reconnaissance samples in the RP area, and only 7 samples were reported positive with respect to visual kimberlitic indicator minerals. A total of 200 garnets, 28 spinels, 81 ilmenites and 46 clinopyroxenes were recovered from the sample concentrates (Map 5 & Table 2).

3.4 Mineral Chemistry

Mineral chemistry for the visually positive grains from reconnaissance sampling are also received and shown in Fig 1-8.

3.5 Security Appraisal of the RP Area

Reconnaissance sampling has been completed only in the non forest areas and in safe areas not infested by naxallites. An internal Security review of the RP area was done to assess the possibility of any further reconnaissance sampling in the area. There was a plan to

collect more reconnaissance samples in the license area. According to the security report, the area did not seem feasible to pursue any further ground follow-up work.

4. Training

De Beers maintains high operating standards including safety and environmental awareness. To this end, training is an integral part of career development with the organization. The following is a short summary of training completed to date.

All staff including geologists and field drivers received first aid and safety training, including fire fighting. All staff also receives ongoing education in HIV/AIDS awareness and other wellness issues. Geologists received training in field navigation, sample site selection, sample collection, labeling and recording of sample data. Quality control and further on the job trainings are ongoing

5. Remarks

Due to critical security condition in the RP area our sampling was restricted to comparatively safer areas. Further work could have been done only if the area was safe to work on.

A security assessment was done for the area using both internal and external sources. All reports clearly state that the RP area is not safe to work. There seem to be no signs of improvement in the security situation within the RP area in near future.

An area of 1084 km^2 was already relinquished on 4th April 2010, since sampling did not indicate possibility of having potential source of any diamondiferous kimberlite in this area. Remaining RP is completely relinquished due to unfavourable security conditions within the RP area.

6. Personnel

De Beers maintains high operating standards including Environmental, Community, Occupational Health & Safety and Environmental (ECOSH) awareness. Through effective management practices the group aims to ensure the health and safety of its employees

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