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Closing Report on Reconnaissance Permit F-21/2002/M, Chhattisgarh

Report for the period 08/05/03 to 19/12/05

Chhattisgarh
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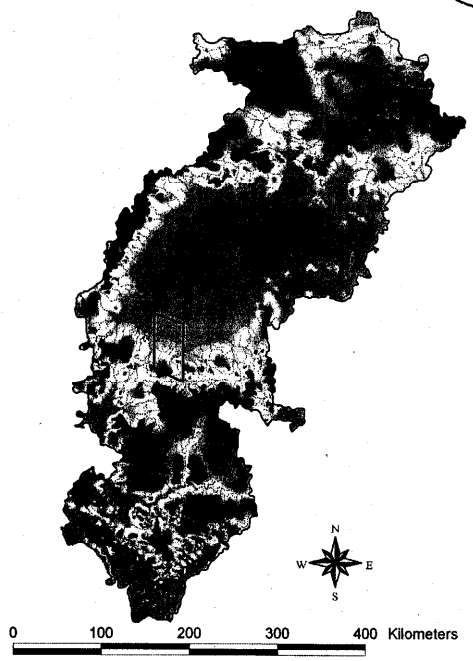

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DE BEERS INDIA PRIVATE LIMITED

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F – 21/2002/M, Chhattisgarh

Report for the period
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1. Reconnaissance Permit (RP) Status

The initial RP of 2000 sq km was executed at Raipur on 8th May, 2003. As per rule 7(i) (a) of MCR 1960, 50% of the initial area was relinquished on 7th May 2005 to retain 937 sq km. The whole of the RP area was relinquished on 19th Dec 2005. Please see Map1 for detail. This report summarizes the exploration work carried out in the RP area during the entire period from 8th May, 2003 to 19th December, 2005.

2. Geology of the license area

The lithological units exposed in the Reconnaissance Permit (RP) area are granite and granite gneisses of the Peninsular Gneissic Complex of Archean age and Upper to Middle Proterozoic Chhattisgarh Supergroup sediments (Map 2). The southern part of the RP area consists of granite, gneisses, and migmatites, the central and northern part of the RP area is occupied with the Chandrapura and Raipur group rocks of the Chhattisgarh Supergroup.

The granite in the license area is intruded by basic dykes trending NW-SE. Most of the granitic country is covered under thick residual soil.

The granites and gneisses are overlain by sandstones and flaggy limestones and shales of Chhattisgarh Supergroup sediments with an unconformity represented by a thin impersistant conglomerate. The conglomerate is comprised of angular to subangular vein quartz with a ferruginous matrix. Although it is correlated with the Banganapalle conglomerate of the Kurnool Supergroup in Andra Pradesh, the impersistant conglomerate here is not known for diamonds and there is no literature available about any work carried out on these conglomerates.

Most of the RP area irrespective of the underlying lithological unit is covered with clays containing scattered chert pebbles. These flat and clay rich areas are covered with forests and paddy fields.

The Chhattisgarh Supergroup sediments are almost horizontal. However the local disturbance is noticed at a few locations and may be due to minor faults. No intrusive rocks into the sediments could be seen in the RP area while carrying out sampling in non-forest areas.

3. Geomorphology of the area

The area consists of three types of terrain reflecting the rock types (Map 2). The sample density varies depending upon the geomorphology of the area.

1) Terrain underlain by Chhattisgarh sediments in the northern part of the area is poorly drained with gentle slopes. Sample density was increased to one in every 3 sq km to cover the area more effectively for kimberlitic indicator minerals. Poor recovery of indicator minerals is consistent with the quality of the trap sites in this area.
2) Terrain underlain by metavolcanics in the southern part of the area is well drained with moderate to gentle slopes. These samples are rich in heavy minerals and are consistent with the quality of trap sites reported.
3) The granitic terrain in the southern part of the area is covered with thick residual soil and is poorly drained. Loam samples were collected at 1.5 km grid in flat terrain to cover the area more effectively for kimberlitic indicator minerals.

4. Activity during the period 08/05/2003 to 19/12/2005

Exploration activity was conducted from a field camp established in the town of Balod.

4.1 Reconnaissance Sampling

Reconnaissance stream and loam sampling was completed with a total of 375 stream and 262 soil samples being collected with an average sample density of 1 sample per 3 km^2. All the samples have been processed, analysed and results received. Sample locations are shown on the attached map (Map 4) and sample details are recorded in Table 1.

Stream samples comprise 75 litres of material screened through 10 mm mesh from a natural heavy mineral trap sites. This – 10 mm fraction material is further screened to 2 mm. Loam samples comprise 30 litres of – 10mm material and for further processing all the samples were transported to the De Beers India Sample Treatment Centre in Peenya (PSTC), Bangalore.

All samples received from the field passed through a series of treatment processes to produce heavy mineral concentrates at Peenya Sample Treatment Center (PSTC). The raw sample collected from the field was wet screened to -1 to +0.5 mm where the sample weight was reduced by up to 80%. The screened fraction from wet screening was than sent to a dense media separator to reduce sample weight by ~95% which was followed by acidization where samples were boiled with 20% sulphuric acid and 80% water for one hour to remove the surface coatings of the concentrate making mineral identification possible. After acidization, the samples were sent for ultrasonic cleaning, to get a clean concentrate which was sent for either low or high intensity magnetic separation based on the nature of the sample. Large samples containing a significant proportion of minerals denser than 2.95 gm/mL were then passed through lithium hetero- polytungstates mixed with water at a density of 3.1 gm/cc. The sinks and floats are separated and the sink portion dried and sent to Bangalore Mineralogical Laboratory (BML) to recover kimberlitic indicator minerals.

The concentrate received from PSTC was subjected to microscopic examination at BML to recover kimberlitic indicator minerals. Suspected kimberlitic grains were then sent to De Beers Heavy Mineral Laboratory in Melbourne for detailed classification and then on to De Beers Geoscience Lab in South Africa for electron micro-probe analysis.

4.1.1 Reconnaissance Sampling Results

Results were received for all reconnaissance samples in the RP (Map 5 and Table 2), and 196 samples reported positive with respect to kimberlitic indicator minerals. Totals of 2648 spinels, 4 garnets, and 3 ilmenites were reported. No clinopyroxenes were recovered. One micro-diamond was recovered from a reconnaissance stream sample (Table 3).

4.2 Follow up Sampling

Based on the results of reconnaissance sampling, follow up sampling was done in the anomalous areas.

A total of 32 stream and 14 loam samples were collected in the first phase follow up stage. Stream samples comprise 75 litres of unscreened material, collected from natural heavy mineral trapsites and field screened to –2.0mm whereas loam samples comprise 30 litres of unscreened material, collected from deflation surfaces. These samples have been processed, analyzed and results received.

A total of 12 stream samples were collected in the second phase of follow up. Samples comprise 75 litres of unscreened material, collected from natural heavy mineral trapsites and field screened to -2.0 mm.

Sample localities and information are shown in Map 7 and recorded in Table 5 and Table 7.

4.2.1 Follow Up Sampling Results

Results for all the follow up 1 samples in the RP were received (Map 8 and Table 6) and 31 samples reported positive with respect to kimberlitic indicator minerals. Only spinel grains were reported in the follow up 1 samples. No other indicator minerals were recovered.

Results for all the follow up 2 samples in the RP were received (Map 9 and Table 8) and 4 samples reported positive with respect to kimberlitic indicator minerals. Only spinel grains were reported in the follow up 2 samples. No other indicator minerals were recovered.

4.2.2 Rock Samples

A total of 3 rock samples were collected as a part of follow up sampling phase. One rock sample was collected from AHS anomaly area and two conglomerate rock samples were collected from Chandrapura clastic sequence exposed extensively in the area (Table 4 and Map 6). The petrography examination of the AHS rock sample confirms its unrelated schistose rock type.

4.3 Mineral Chemistry

Scanning Electron Microprobe analysis was done on spinel (3,829 analyses), garnet (71 analyses), Ilmenite (159 analyses) and Clinopyroxene (33 analyses).

The spinel chemistries indicate the presence of a dominant non-kimberlitic population with a subordinate mantle-derived population possibly indicating the presence of kimberlites. The non-kimberlitic population may derive from the volcanics and secondary sources exposed in the RP.

The mantle derived population extends into diamond inclusion and diamond intergrowth regions of standard plots (Figure 2 and 3), indicating that the source kimberlites may be of high interest.

The garnet analyses indicate the presence of three probably lherzolitic garnet, and a dominant population of non-kimberlitic (but possibly eclogitic) grains. No G10 garnets were reported (Figure 1). The ilmenites and clinopyroxenes appear to derive from unrelated sources (Figure 4 to 8).

4.4 Airborne Multispectral Scanner (AMS) Survey

An airborne survey utilising De Beers's proprietary hyperspectral scanner technology was conducted over the RP in April 2004. The system works by measuring reflectance of narrow wavelength bands of sunlight reflected from the Earth's surface. Different minerals (as well as other materials) absorb different wavelengths of light to varying degrees. The AMS system is sensitive enough to actually distinguish some specific types of minerals by the absorption of certain wavelengths of light detected. In diamond exploration, the system is configured to look for the presence of magnesium-rich clay minerals, derived from the weathering of kimberlites and other ultramafic rocks.

The AMS equipment was fitted onto a P68C (registration VT-TAH) aircraft chartered from Taneja Aerospace and Aviation Limited, 1010, 10th Floor, Prestige Meridian - 1, 29 M.G Road, Bangalore 560 001. The surveying was conducted from an altitude of 9,500 ft (2,896 m) along flight lines 2 km apart.

A false colour composite image of RP is shown in Map 10.

A total of 69 anomalies were selected as areas comprising Mg-rich clays with the potential to be kimberlites in this RP (Map 11). Follow up of the survey involved field visits to anomalies to check the causative lithological units (Table 9). Pits (~2m) were made in few occasions over the anomaly area to confirm the causative body beneath the causative surface soil. Samples collected from the anomaly area were analyzed in PIMA (Portable Infra-Red Mineral Analyzer) to confirm that the lithology identified on the ground corresponded to the anomalous Mg-rich absorption feature identified by the aerial survey. PIMA analysis was carried out in the field camp.

All the 69 anomalies were resolved with confirmed causative bodies.

No kimberlite was discovered from this survey.

All the plots of AMS anomalies followed up are attached as Appendix 1.

4.5 Airborne Geophysical Survey

A TEMPEST Survey was flown by Fugro Airborne Surveys (FAS) over the Balod Project area. Electromagnetic and magnetic data were acquired from the survey. The Tempest EM and Mag system was flown with a line spacing of 200m and terrain clearance of 120m in a north-south traverse line direction. A CASA C212 – 200 Turbo Prop Survey Aircraft registration VH – TBM was used for this survey.

The Tempest survey over this RP was flown in April 2004. A total of 13009 line kilometres was flown in this RP.

Based on the airborne magnetic and EM survey over the RP area, 88 anomalies were identified (Map 14) for ground geophysical follow up. An apparent conductivity image is shown in Map 12 and Total Magnetic Intensity (TMI) image is shown in Map 13.

4.6 Ground Geophysical Survey

A total of 22 anomalies were covered by ground EM survey out of 27 anomalies identified from Airborne Survey. A summary of Geophysical anomaly follow up status is given in Table 10 and 11. The plots of ground magnetic and ground electromagnetic data are attached as Appendix 2 and 3 respectively. Based on encouraging visual and probe results received from reconnaissance and follow up stream and loam samples collected from this RP a total of three blocks were covered by ground magnetic survey (Map 15) in this RP. A total of ~1525 line kilometer was covered by ground geophysical surveys in this RP. A total 15 anomalies were identified for drilling from these survey blocks.

4.7 Drilling

A total of 42 boreholes were drilled in the RP area during the reporting period using percussion and core drilling methods (Map 16). Thirty six boreholes were drilled on geophysical anomalies and 6 boreholes were drilled around positive samples with respect to kimberlitic indicators. A summary of borehole details is given in Table 12. The borehole log sheets of the anomalies drilled are attached as Appendix 4. All the boreholes were drilled using the best practice principles and were rehabilitated.

5.0 Interpretation

Based on the sampling and other results received after applying various techniques of exploration from this RP, it is concluded that the residual potential of the RP for the discovery of large economically viable diamond bearing body is small. Various isolated areas in this RP reported a number of spinel grains with favorable mineral chemistries. The kimberlitic grains recovered from these isolated areas in the RP are inferred to have derived from dykes and secondary sources (basal conglomerate unit exposed extensively in this area). Considering the low residual potential of the RP to find a potential diamondiferous kimberlite, it was decided that no PL application would be lodged.

6.0 Personnel

Name	Designation	Education
Basudeb Datta	Senior Geologist	M.Sc. - Applied Geology
K.V.Praveen Kumar	Staff Geologist	M.Tech-Remote Sensing
Anuradha Sarangi	Geologist	M.Sc Geology
Prashant Laharia	Geologist (in contract)	M.Sc Tech Geology
Sukhbinder Sharma	Geologist (in contract)	M.Sc Geology
Manish Kumar	Geophysicist	M.Sc. Tech-Geophysics
Rekha K.R.	Kimberlitic Mineral Analyst	M.Sc Geology
Shobha N.	Kimberlitic Mineral Analyst	M.Sc. Geology
Sanjay Deogiri	IT Manager	B.Sc. Electronics, MCSE
Rina David	SHE Officer	MBA
Oblesh	Field Driver	X Std.
J.Subramani	Field Driver	X Std.
Padbanabham	Field Driver	XII Std.
Raghu M.	Drill Operator	X Std.
Siddaraju	Drill Operator	XII Std.
Gajanana Naik	Treatment Plant Operator	XII Std.
K.Narayanan	Security Officer	Graduate
Ranchor Bhat	Mag-operator (in contract)	XII Std.
Vijay Singh	Mag-operator (in contract)	XII Std.
Jagdish Lal Jat	Mag-operator (in contract)	XII Std.

Labour

Labourers were employed on a daily basis from local towns and villages to help with the field work.

7.0 Expenditure

Total expenditure of Rs 82,582,595 incurred for the Reconnaissance Permit to date. The expenditure was incurred as follows:

Capital expenditure: Rs 7,665,462

Revenue Expenditure: Rs 74,917,133

8.0 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 trainings completed to date.

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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. All geologists received training on First Aid conducted by International SOS.

Geologists received training in field navigation, sample site selection, sample collection, labeling and recording of sample data, core drilling. Both geologists and geophysicists have also received training in undertaking of ground magnetic and electromagnetic surveys. Quality control and further on the job training is ongoing.

Geologists have also received training in basic kimberlite geology and field identification. Field orientation training to all the new geologists and geophysicists was scheduled in the first week of Feb'2005 on the southern India known kimberlite occurrences.

Geologists and geophysicists received training on ArcGIS software during the reporting period. Training on upgraded ArcGIS for all the geologists and geophysicists was scheduled in the second week of March'2005.

Geologists attended a Geosoft training programme in August 2004.

Sojen Joy
Technical Services Manager
De Beers India Pvt. Ltd.
(Formerly known as De Beers India Prospecting Pvt.Ltd.)

Basudeb Datta
Senior Geologist
De Beers India Pvt. Ltd.