

Mineral Resources of Jaipur

During geological field studies, while taking traverses around the village Bichun in Mozamabad tehsil of Jaipur district, crystal quartz was noticed in the earth dumps lying by the side of the Bichun-Adoda road, which was under construction. On examination, the area adjoining to the above road appeared to be interesting for search for quartz crystals. A few pits were put which further confirmed the presence of the crystal quartz in the area and therefore it was decided to take up systematic geological studies in the form of one of the projects under prospecting and Mineral Survey Scheme of the Department.

The prospecting operations were started in October 1985 and these were continued till Jun 1986. An area of 28.60 sq kms around Bichun village was reserved for departmental prospecting; it is located about 4 km from Jaipur. Under this project reconnaissance in 210 sq kms area lying between latitude $27^{\circ} 37'$ to $27^{\circ} 41'$ longitude $75^{\circ} 17'$ to $75^{\circ} 33'$ in Survey of India toposheet No. 45 N/5 was carried out R.G.M. in 6 sq. kms area near Bichun and Bandola-Ki-Dhani and D.G.M. in 0.5 sq. kms. area near the trijunction of Bichun-Mokhampura-Phulera road were also done.

The rock formations encountered in the area are schist and gneisses, quartzites and limestone, which belong to the Aravalli Super Group. These are intruded by amphibolite, pegmatite and quartz veins. During reconnaissance, crystal quartz was noticed near Bichun Bandola-Ki-Dhani south of Ramsagar village, Dadu-Palkan temple and in the Bichun hill about 1.5 kilometers southwest of Bichun village. The crystals occur with quartz veins along the fractures and joints in the quartzites in the area. In order to see the depth continuity of crystal quartz, 25 pits and 3 trenches were put, the total excavation being 172 cubic meters. The pits and trenches were put near the trijunction of Mokhampura, Bichun-Phulera road (6 pits, 3 trenches), Bandola-Ki-Dhani (4 pits), Bichun-Akoda Road (7 pits), near the road (3 pits), Ramsagar (2 pits) and near Dadu Palakan (3 pits). Crystal quartz was encountered in 17 pits and trenches. In general the crystal quartz was found to be transparent to semitransparent with minor ferruginous inclusion. The crystals are generally 1 to 5 centimeters in length, however the longest crystal encountered measured about 12 centimeters. The crystals were found to occur up to the depth of 3 meters as was noticed in the pits, however the occurrence of these crystals in further depth cannot be ruled out. During prospecting about 50 kg. crystals quartz both transparent and translucent was obtained, out of which about 15 kg. crystal were more or less transparent and were more than 2 centimeters in length. The National Physical Laboratory, New Delhi have been contacted to indicate the possible uses of the types of crystals obtained from Bichun area. For these purposes a few selected crystals, have been sent to the laboratory for examination, the findings are awaited.

Mineral Resources of Tonk

General: Tonk is comparatively a smaller and backward district of Rajasthan. It is inhabited by a population of about 626000 people over an area of 7,163 sq. km. Formerly, Tonk was an old Muslim State under the rule of Nawabs of Tonk. The main occupation of the people of Tonk is agriculture and about 4800 sq. km. area of the district is under cultivation and more than 75% population is engaged in this occupation. There are no big industries in the district except the State owned Tenergy located in Tonk itself.

Location & Approach: Tonk district is located in the eastern part of the state. Its boundary joins with that of Jaipur in the north, Ajmer in the west, Bundi in the south, Kota in the southeast and Sawai Madhopur in the east.

Apart from Tonk, which is the district town, other important towns of the district are Uniara, Aligarh, Toda Raisingh, Deoli, Malpura and Niwai. Tonk district is traversed by the State Highway No. 1, which passes through Niwai, Tonk and Deoli. There is also a network of class 1 and 2 roads in the district, connecting all important localities. The Jaipur-Sawai Madhopur meter gauge section of western railway passes through the northeast corner of the district. Another important rail link of the district is the Jaipur-Toda Raisingh meter gauge section, which terminates at Toda Raisingh. Amli is the only railway station in the district, which falls on Kota-Sawai Madhopur broad gauge section of western railway.

Physiography & drainage: The district mainly comprises a flat peneplain with thick alluvium cover. However the Rajkot-Baneta hills in the eastern part and Raj Mahal-Toda Raisingh ridge in the southern part of the district with isolated hills at Tordi and Chansen are the main hill ranges in the district. Banas is the only perennial river, which enters the district near Deoli in the southwest and emerges out of the district near Saroli in the east dividing the district in almost two equal halves.

Climate: The climate is moderate, maximum and minimum temperatures remain up to 44⁰ C and 4⁰ C respectively. Average annual rainfall is about 60 cm.

Geology: The district comprises the rocks belonging to Aravalli and Delhi groups of rocks. The Aravalli are represented by the schist and gneisses and the Delhis by grits, conglomerates and quartzite. But as per the recent G.S.I. publications the quartzite, grits, conglomerates and the schist and gneisses all have been considered to be of pre-Aravalli age. The general trends of formations vary from N-S to NE-SW with steep dips. The Aravallis and Delhis have been intruded by post Delhi granites, pegmatite and basic dykes.

The grits and conglomerates are best exposed along the foot hills of Toda Raisingh-Botunda ridge whereas the main hill ranges of Rajmahal-

Toda Raisingh and Tordi-Chansen, etc. are composed of quartzite. Phyllites are exposed in the southeastern parts of the district near Aligarh, Sop, etc. Rest of palin area is occupied by schist and gneisses. The geological succession in Tonk district is given as below (after GSI).

Recent to Sub-Recent	-	Sand, alluvium, etc.
Post-Aravalli	-	Granite (intrusive)
Pre-Aravalli	-	Schist, gneisses and (migmatites,
Phyllites,		marble and quartzites)

Mineral Resources: Tonk district is known on the mineral map of the state for its important occurrences of garnet and aquamarine. The other important mineral occurrences of the district, are glass sand, mica and alusite, corundum and building stones.

The details of various mineral occurrences are given below

(1) **Aquamarine:** Aquamarine is one of the semiprecious varieties of beryl with sea green to greenish-blue colour and transparency. Though beryl occurrences have been reported from over 150 localities in the State, aquamarine is so far known to occur only in Toda Raisingh area of Tonk district. In Toda Raisingh area aquamarine occurrences have been reported from Toda Raisingh, Bagri, Rampura, Jhonparia, Botunda, Tharoli and Hamirpur areas. Aquamarine, along with beryl occurs within or at the contact of pegmatite with the host rock. State Department of Mines and Geology had carried out prospecting in Toda Raisingh area during the year 1969-70, 70-71 and 79-80.

(2) **Garnet:** Garnet is considered as glory of Rajasthan which is the sole producer of gem garnet in India. Tonk district is enjoying top position in the production of garnet. There are twenty five mining leases of garnet in the district generally confined between Rajmahal and Kalyanpura in a zone of chlorite-biotite schist covering a length of 11 km. In the south the strike NE-SW becomes N-S when traced towards north. There are irregular zones near Ragunthpura, Raota, Tordisagar and Bagri (Sisola) covered under mining leases.

As a result of preliminary assessment made by the State Department of Mines & Geology reserves of 213 and 5318 tones of garnet have been indicated for gem and abrasive varieties respectively. Further reserves to the tune of 8250 and 75450 tones of gem and abrasive variety respectively have been assessed in the inferred category.

Some of the garnet mines are not under operation due to two reasons viz. de-watering problems and lack of abrasive industries in the near by area to consume abrasive fraction. As such abrasive fraction plays no role in mine economy and selective mining is done for gem fraction only.

- (3) **Corundum:** Corundum occurrence has been known from only one locality in Tonk district near Juali village in Tonk tehsil. Corundum occurs as barrel or pyramidal shaped rounded crystals of 1 to 9-cm size. It is found associated with the cordierite-biotite-corundum rock. Along with corundum occurrence, ruby (a semiprecious variety of corundum) is also reported from this area but there is no significant concentration of this mineral.
- (4) **Silica Sand:** Silica sand is the principal raw material for the manufacture of glass. Rajasthan is the third largest producer of silica sand in the country. Though major production of silica sand in Rajasthan comes from Bundi, Jaipur and Sawai Madhopur district, Tonk district is also contributing a little. The silica sand occurrences in Tonk district have been reported from Bher, Siwad, Newai, Gangapur, Barthol and Nohta areas. The estimated reserves are 6.05 million tones at Bher and 2.8 million tones at Newai. 3.8 million tones are expected to be of friable variety capable of yielding pure silica sand.
- (5) **Mica:** The mica-pegmatite belt passes through part of the district between Devran and Tonk. Mica occurs within pegmatite, which are intrusive in the schist and gneisses. The two mica mines are located near Dholi and Bhojpura near Phagi.
- (6) **Andalusite:** Occurrences of andalusite were discovered during the departmental prospecting in the year 1970-72 near Sitapura, Sardarpura and Anwa villages. This is the only independent occurrence of this mineral so far known in the State. The mineral occurs in the form of elongated prismatic crystals within the mica schist. The width of mineralized zone is about 60 mts. The alumina content varies from 40% to 50%, which is slightly below the normal industrial requirement. The recovery ratio of the mineral is about 3% to 4% only.
- Apart from the above, minor production of felspar and quartz has also been reported associated with felspar-mica pegmatites.
- (7) **Building and slab stones:** Besides the above important mineral occurrence, buildings and slab stones and Bajri, etc. are also exploited in plenty. There are 87 leases of such material existing in the district.