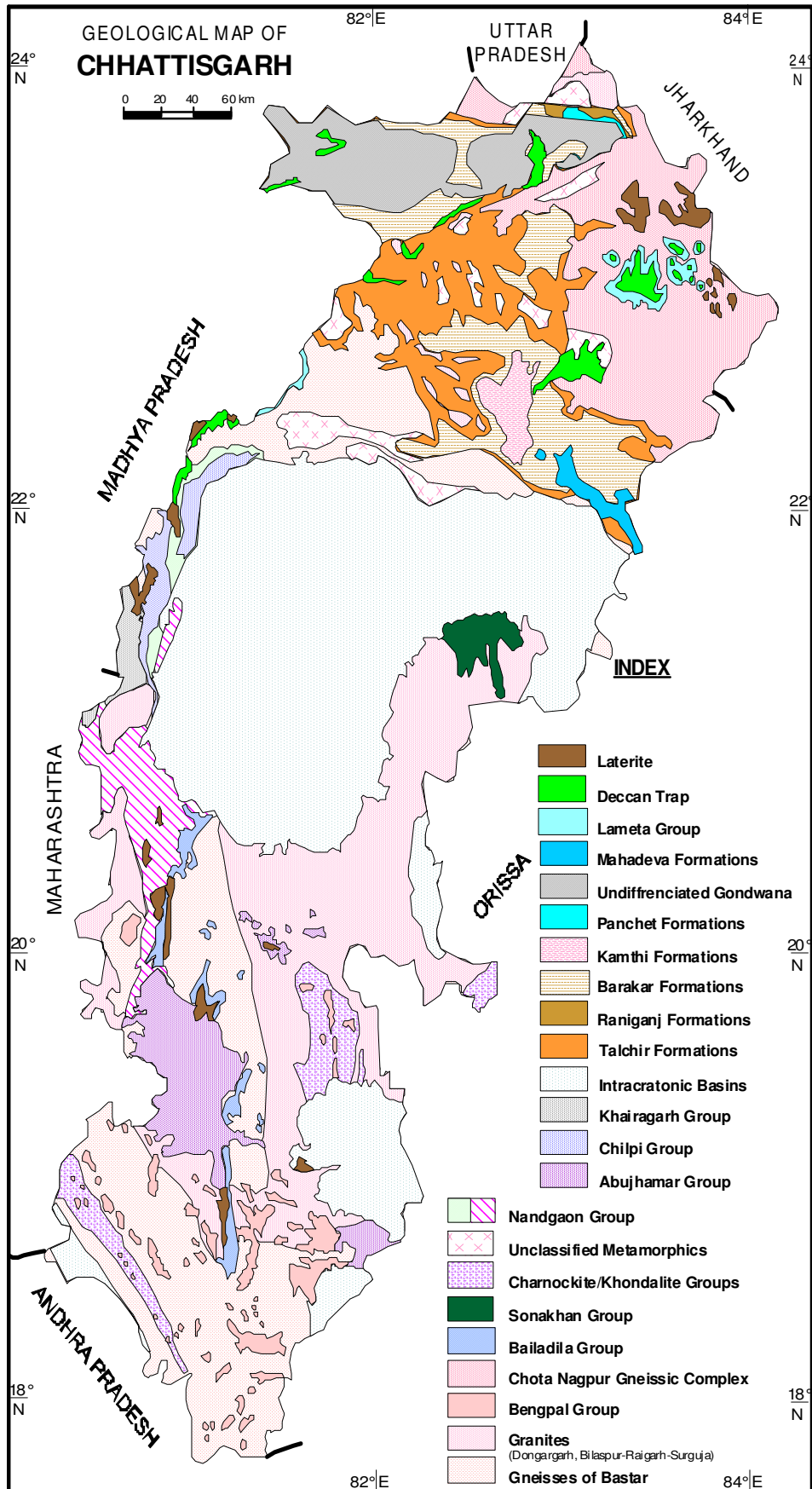


2. Mineral Resources of chhattisgarh

2.1 Geological map



Chhattisgarh hosts a wide variety of minerals found associated with igneous, sedimentary and metamorphic rock formations. A few of them form large economic deposits while a number of other minerals are reported as occurrences. Large deposits of Coal, Iron ore, Limestone, Dolomite and Bauxite are located in parts of the State. Diamondiferous kimberlites identified in Raipur district are also likely to yield substantial quantity of diamonds. Tin (Cassiterite) bearing pegmatites containing moderate deposits are also known. Medium to small deposits of gold, base-metals, quartzite, soapstone/steatite, fluorite, corundum, graphite, lepidolite, amblygonite of workable size are also known that may grade in the category of large deposits after exploration. Occurrences of garnet, amethyst, beryl, andalucite, kyanite, sillimanite and rare precious mineral alexandrite are also reported from different parts of the State. A few of these may prove to be of sizable deposit. Deposits of grey, pink, red and black (dolerite, amphibolite and gabbro), granites and flagstone of grey, black and purple shades are widely distributed that are suitable for dimension stone and decorative purposes.

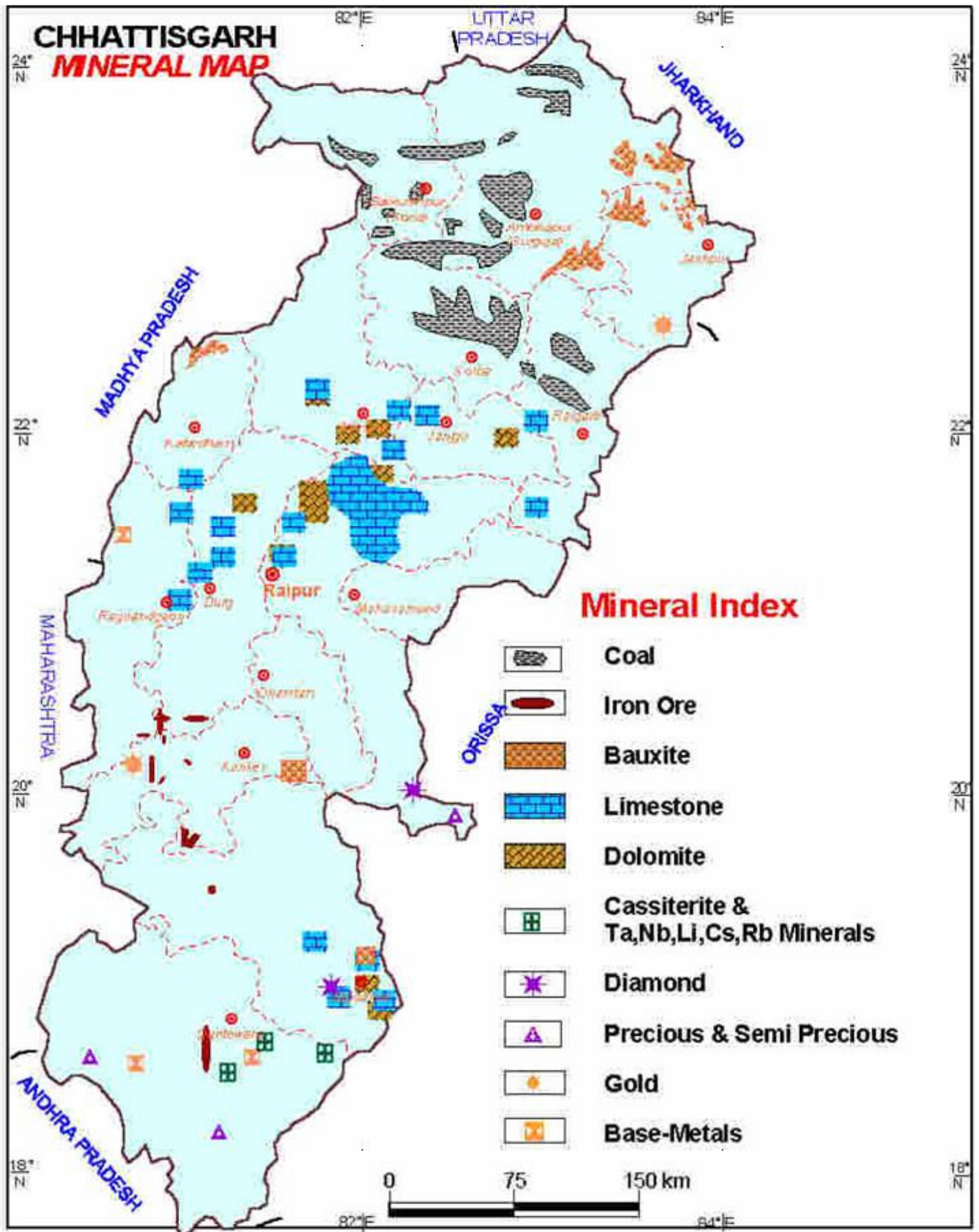
Reserves of Important Minerals in Chhattisgarh

(As on 1.4.2005)

S.No.	Mineral	Unit	Reserves		% in Chhattisgarh
			India	Chhattisgarh	
1.	Iron ore	Million Tonnes	14630	2731	18.67
2.	Coal	Million Tonnes	267210	44483	16.36
3.	Bauxite	Million Tonnes	3290	148	4.50
4.	Limestone	Million Tonnes	175345	9038	5.15
5.	Dolomite	Million Tonnes	7533	847	11.24
6.	Tin Ore	Million Tonnes	86.55	32.62	37.69
	Tin metal	Tonnes	101237	14449	14.27
7.	Gold Ore	Million Tonnes	390	0.90	0.23
	Gold metal	Tonnes	491	2.70	0.55
8.	Corundum	Tonnes	83795	885	1.06
9.	Quartzite	Million Tonnes	1145	26	2.27

* As on 1.4.2009

2.2 Mineral Map



2.3 IRON ORE

Iron ore deposits of Chhattisgarh are associated with the rocks that are world over known to contain high-grade ores (Hematite) i.e. Banded Iron Formation. These rocks are forming almost North-South trending narrow, highly dissected and discontinuous hill ranges of about 370 km in length that are extending from Bailadilla to Rajhara in southwestern Chhattisgarh occupying Dantewara, Bastar, Kanker, Narainpur, Rajnandgaon, Durg and kabirdham districts. Bailadilla iron ore deposits located in southern part of the range are world-class and being mined from the leased area to National Mineral Development Corporation, Ltd. (NMDC). Iron ore of Dalli-Rajhara located in the central parts of the range are captive mines of Bhilai Steel Plant (BSP).

Recently an iron ore bearing area is discovered in Kabirdham district and known as Eklama iron ore complex. This area is expected to yield high-grade hematitic iron ore in substantial quantity and support iron & steel units.

At a few places, small deposits (including isolated patches) may be related to other geological phenomenon are also known, which may not be economical for large establishment mine production. However, they can be used for sponge iron units.

BSP is a major Iron and Steel producing plant in the State. Two major iron ore and steel plants of M/s Tata & M/s Essar are under pipeline in Bastar and Dantewara districts respectively. NMDC also plans to install a major plant in Nagarnar area of Bastar district. Apart from these a large number of sponge iron units are under production or pipeline. Steel casting, re rolling, pig iron, steel ingot, etc. units are operational/proposed in parts of the State based on the raw material availability in the State.

Part of Bailadilla and Dalli-Rajhara areas are being actively mined by NMDC and BSP respectively. A number of prospecting licenses and a few mining leases have been granted for the parts of the other known iron ore deposits.

Sr.No.	Locality	Reserve (MT)	Grade (Fe%)
1.	Bailadila, Dantewara	1344	60-68
2.	Raoghat Kanker	732	55.65
3.	Boria Tibbu, Rajnandgaon	10	63.68
4.	Hahaladdi, Kanker	12.80	64 average
5.	Metabodeli, Kanker	15.60	65.6 average
6.	Chhota Dongar, Bastar	35.31	64-66
7.	Chargaon, Kanker	21.80	60
8.	Aridongri, Kanker	26	65
9.	Dalli Rajhara, Durg	165	66
10.	Eklama, Kabirdham	200.722 (inferred)	+65

2.4 BAUXITE

Chhattisgarh mainly comprises metal (B & C) and refractory grade (A) bauxite, located in Surguja, Korba, Jashpur, Kanker, Bastar and Kabirdham districts. Total estimated reserves of all grades are of the tune of 148 million tonnes.

Bauxite exploitation in the State is reserved for Public Sector Undertaking either singly or through JVC working.

A number of PL and ML have been granted / sanctioned in parts of the State. However, there are potentials of prospecting and mining bauxite deposits in these areas. Bauxite of Chhattisgarh is being consumed mainly in Aluminium Extraction and Calcination Plants. Aluminium extraction plant of BALCO is operational at Korba, based on the leased bauxite blocks of Mainpat in Surguja district from their own ML area, lease hold areas of CMDC and other operators. Aluminium extraction plant of HINDALCO located at Renukot, in Uttar Pradesh is another consumer of Samripat area, Kusmi Tehsil, Surguja district from Chhattisgarh from their ML hold area and lease hold areas of other operators. The existing Bauxite deposits may suffice the need of an Aluminium plant of 1 million tonne production capacity in the State.

Brief information of known bauxite bearing areas is as follows:

SURGUJA DISTRICT

Mainpat

Mainpat (65 N/1 & 5) forms an almost oval, E-W elongated plateau (average 1050 m altitude) occupying about 470 km² area, which is situated in the southeastern part of the Surguja district. Bauxite is widely developed in the form of pockets and lenses within extensively developed laterite over the Deccan basaltic plateau.

JAMIRAPAT

Samripat and Jamirapat (64 M/15) forming irregular plateaus occupying about 322km² and 112km² area respectively are situated in the eastern part of the Surguja district. Bauxite is widely developed in the form of pockets and lenses within extensive laterite over the Deccan basaltic plateau.

JASHPUR DISTRICT

PANDRAPAT

Pandrapat forms an irregular shaped plateau of about 500 km² and its eastern extension is highly dissected with several small plateaus occupying overall about 700km² area situated in the western part of Jashpur district. These plateaus are capped by laterite, over the Deccan basaltic flows containing Bauxite in the form of pockets and lenses of various dimensions.

KANKER DISTRICT

KESHKAL AREA

Bauxite is developed in the form of pockets and lenses on small plateaus of varying dimensions in Keshkal area. It figures within the extensively developed laterite over the Bahmni sandstone, forming capping over hilly terrain of granite. Bauxite of this area belongs to A and B grade and may be considered as refractory grade.

KABIRDHAM DISTRICT

In the district, Bauxite is known in and around villages Bodai Daldali, Keshmarda, Rabda, Mundadadar and Samsetta. A total reserves of 6.12 million tones of metal grade bauxite is expected from the area. The area is leased out to BALCO.

Recently DGM has identified number of bauxite occurrences in Kabirdham district. Over 25 localities, in northern and north western part, of varying dimension (length 250 to 500 m.) have been identified. Over 11 million tones of metal grade bauxite is expected from there localities. Al₂O₃ content varies from 35 to 60%.

BASTAR DISTRICT

A small bauxite pocket has been discovered by DGM in Asna - Tarapur area of Bastar district. The area is a few kms. away from Jagdalpur, 1.5 million tones of bauxite has been estimated from the area.

Sr.No.	Locality	Reserve (MT)	Grade (Fe%)
1.	Mainpat area, Surguja	31.32	Metal grade
2.	Khandraja block, Mainpat, Surguja	10.10	Metal grade
3.	Jamirapat area, Surguja	40.50	44 to 56% Al ₂ O ₃
4.	Pendrapat area, Jashpur	12.93	Metal grade
5.	Bodai-Daldali area Kabirdham	6.12	Metal grade
6.	Keshkal area, Kanker	6.44	refractory grade
7.	Asna Tarapur area, Bastar	1.5	Metal grade

2.5.1 LIMESTONE

Limestone and Dolomite are the carbonate rocks that are mainly used for cement manufacture and metallurgical purposes with other allied uses of calcinations, flux, refractory bricks, dimension stones etc. based on the grade. These sedimentary rock are precipitated in identical environment to form widespread and continuous deposits. Limestone comprises of high calcium carbonate, while Dolomite is a double carbonate with higher concentrations of magnesium carbonate (>19% MgO) and calcium carbonate (20~35% CaO). Limestone and dolomite deposits are known in the State located in Raigarh, Janjgir-Champa, Kabirdham, Bilaspur, Raipur, Durg, Rajnandgaon districts forming part of Chhattisgarh basin in Jagdalpur district within Indravati basin and in Dantewara district in Sukma basin.

Total estimated deposits of all grades of limestone are of the tune of about 9038 million tonnes as per Indian Bureau of Mines (IBM; Mineral Year Book, 2006) publication.

Directorate of Geology and Mining, Chhattisgarh in engaged for prospecting of limestone for last many years. Subsequently a large number of suitable sites for establishment of cement plant of various magnitudes have been identified in the state. A list of such sites is as given under.

A large number of PL and ML of Limestone have been granted in favour of tens of companies mainly for the production of Portland cement. These are also being mined for other industrial purposes.

Sr.No.	Location, tehsil, district	Prospected area (Sq.Km.)	Reserves (MT)	Grade (CaO% Average)
1.	Maldi-Mopar, Karmadih, Bhatatpara, Raipur	8.00	308.655	44.93
2.	Chandi, simga Raipur	6.20	86.88	45.10
3.	Gaitra, Balodabazar, Raipur	2.40	105.30	45.62
4.	Mohra, Simga, Raipur	10.82	96.996	45.00
5.	Basin , Simga, Raipur	5.64	10.758	45.79
6.	Nahardih, Madhaipur, Tilda Raipur	1.29	27.088	44.62
7.	Shuklabhata Sonpuri, Balodabazar, Raipur	2.59	31.777	45.00
8.	Ameri Pendri , Simga, Raipur	2.12	1.829	45.27
9.	Amlidih , Bhatapara, Raipur	0.73	12.00	45.42
10.	Pharsabhader, Balodabazar, Raipur	6.12	216.382	46.03
11.	Kukardih, Balodabazar, Raipur	5.04	209.795	45.31
12.	Mohrenga Bangoli , Tilda, Raipur	10.71	26.929	45.41
13.	Pauni Khauna, Raipur	1.17	20.70	45.20
14.	Bharuwadih, Pausari Guma, Raipur	14.76	446.00	44.00

15.	Chuchrangpur, Newari, Raipur	6.30	113.884	44.40
16.	Achholi , Dhamdha, Durg	3.74	80.00	48.03
17.	Matra Gota, Dhamda, Durg	11.15	121.04	45.00
18.	Semaria , Dhamda, Durg	3.60	98.00	45.73
19.	Ghotwani , Dhamda, Durg	1.40	21.04	45.58
20.	Chitapur , Jagdalpur, Bastar	3.2	4.00	46.03
21.	Potnar Baranji , Jagdalpur, Bastar	1.4	22.49	45.32
22.	Deorapal, Jagdalpur, Bastar	5.2	19.00	B.F. Grade
23.	Junaguda, Jagdalpur, Bastar	3.2	121.0	45.69 to 46.26
24.	Pamgarh , Janjgir,	3.10	2.12	45.50
25.	Bargaon , Pamgarh, Janjgir	4.40	30.00	45.36
26.	Meubhata, Pamgarh, Janjgir		4.35	45.02
27.	Tendua, Kota, Bilaspur	1.50	11.947	46.13
28.	Charbhata, Rajnandgaon	4.00	41.907	45.70
29.	Tumribor, Dongargaon, Rajnandgaon	2.10	6.92	44.82
30.	Ranjitpur-Manpur, Kawardha	3.87	20.410	45.27

2.5.2 DOLOMITE

A total of 847 million tonnes of dolomite have been estimated from various parts of the State. Dolomite in the state is mostly used for refractory purposes.

S.No.	Locality (MT)	Reserve (MT)	Grade
1.	Tiriya Machkot, Bastar	45.00	MgO 20% CaO 29%
2.	Hirri & Baradwar, Bilaspur	250	High Grade
3.	Kodwa Mohbhatta, Durg	28.00	MgO 20.97% CaO 28.23%
4.	Belpa Dhuma, Bilaspur	27.33	MgO 18.93 CaO 28.12%
5.	Lagra Madanpur, Janjgir Champa	10.00	BF Grade

2.6 COAL

- The state has 16% of the total coal deposits of India.
- 44483 million tonnes coal has been estimated in 12 coalfields of the State located in Raigarh, Surguja, Koriya and Korba districts.
- The state ranks 2nd in coal production by contributing over 18% to the total national production.
- Most of the coal deposits are of power grade coal. NTPC & CSEB in Korba are the major producer of thermal power and new a plant of NTPC has been started in Seepat, Bilaspur.
- Potential for more power generation units exist in the State. New capacities of 10,000 MW are expected to materialize by 2011.

Coal Fields of Chhattisgarh

Sr. No.	Coal Field	Reserves (million tonnes)	District
1.	Sohagpur coalfields	104.38	Surguja
2.	Sonhat coalfields Semi-coking	2665.24	Surguja

	Non-coking		Surguja
3.	Jhilmili coalfields	267.10	Koriya
4.	Chirimiri coalfields	362.16	Koriya
5.	Bisrampur coalfields + east of bishrampur	1498.99 + 41.75	Surguja
6.	Lakhanpur coalfields	451.40	Surguja
7.	Panch bahini coalfields	11.00	Surguja
8.	Hasdeo Arand coalfields	5020.78	Surguja-Koriya
9.	Sendurgarh coalfields	279.21	Koriya-Korba
10.	Korba coalfields	10310.66	Korba
11.	Mand Raigarh coalfields	21853.64	Raigarh
12.	Tatapani-Ramkota coalfield	1616.79	Surguja-Koriya
	Total	44483.10	

Govt. Of India, Ministry of coal have thrown open several coal blocks for captive use in private sector within the state Chhattisgarh which have been allowed to various companies list of these blocks and to whom allowed is as under-

2.7 TIN ORE

Chhattisgarh is the only tin producing State in India. Tin ore is known as cassiterite, which was reported in Dantewara district (Bastar district in formerly Madhya Pradesh) by the Directorate of Geology and Mining associated with the lepidolite bearing pegmatites. Cassiterite bearing pegmatites are reportedly rich in collumbite and tantalite, which are ore of rare metals niobium and tantalum, respectively. Lepidolite is also a source of rare alkali metals namely lithium (Li <2.15%) cesium (Cs <0.83%) and rubidium (Rb <5.9%).

2.8 OTHER MINERALS

Apart from these bulk minerals, there are number of other minerals available in the state. Some important one's are described here -

Corundum:

Precious & Semi precious corundum occurs in Bhopalpatnam, Uloor and Sonakukanar areas of Dantewara district. 50 tonnes of corundum reserves have been estimated in the state. Corundum cutting polishing industries are operational in

Bastar & the semi precious stones of the State find a ready market in the gems industry in Hyderabad.

Diamond:

Incidences of diamond in the rivers of the State and discovery of diamondiferous kimberlite in Mainpur area of Raipur district have attracted global attention. So far six kimberlites in Mainpur area and two kimberlite in Tokapal area have been discovered. Eight blocks have been demarcated based on structural controls to host kimberlites in Chhattisgarh. Potentially 3 diamondiferous kimberlites pipes have been identified in Behradih and Payalikhand villages of Raipur district. The State has emerged as a hotspot for potential diamond mining with all major mining companies engaged in reconnaissance operations.

Other Gem Stones:

A rare gem mineral like Alexandrite is found in the State. Other gemstones like Garnet, Beryl, Rosy quartz, amethyst etc are also reported. Based on the minerals strength of the State, Gems and Jewellery Park is planned near Naya Raipur.

Dimension Stones:

Multicolored and texturally different granites are widely distributed in the State. Limestone, dolomite of attractive colour and design are extensively available in the State. Quartzite, sandstone and shales are also widely exposed which can be suitable as dimension stone. Export oriented cutting & polishing units are working in the State and prospects for many more exist.

Gold:

Potentially gold bearing rocks are available in Raipur and Mahasamund districts. Placer gold panning is widely recorded from Jashpur, Kanker, Mahasamund and Bastar districts. ~3 tonnes of gold reserves are estimated in the State. Global mining companies like ACC Rio Tinto Geomysore Services Pvt. Ltd., etc. are engaged in reconnaissance & prospecting operations for gold deposits in the State.

Base Metals:

Potential base metals like copper, lead indications are known from Rajnandgaon, Mahasamund and Dantewara districts. These metals can be used in electric wires, batteries, manufacture of pigments, alloys etc.

Other minerals like clays, quartzite, fluorite, andalucite, kyanite, sillimanite, talc, soapstone, steatite, marble, silica sand, etc. are also reported from various part of the States.