Indian Minerals Yearbook 2019

(Part- I)

58th Edition

STATE REVIEWS (Chhattisgarh)

(ADVANCE RELEASE)

GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES

Indira Bhavan, Civil Lines,
NAGPUR – 440 001

PHONE/FAX NO. (0712) 2565471
PBX : (0712) 2562649, 2560544, 2560648
E-MAIL : cme@ibm.gov.in
Website: www.ibm.gov.in

March, 2021

CHHATTISGARH

Mineral Resources

Chhattisgarh is the sole producer of tin concentrates and moulding sand. It is one of the leading producers of coal, dolomite, bauxite and iron ore. The State accounts for about 36% tin ore, 20% iron ore (haematite), 18% coal, 11% dolomite and 4% each diamond & marble resources of the country. Important mineral occurrences in the State are **bauxite** in Bastar, Bilaspur, Dantewada, Jashpur, Kanker, Kawardha (Kabirdham), Korba, Raigarh & Sarguja districts; **china clay** in Durg & Rajnandgaon districts; **coal** in Korea, Korba, Raigarh & Sarguja districts; **dolomite** in Bastar, Bilaspur, Durg, Janjgir-Champa, Raigarh & Raipur districts; and **iron ore (haematite)** in Bastar district, Bailadila deposit in Dantewada district, Chhote Dongar deposit in Kanker district, Rowghat, Chargaon, Metabodeli & Hahaladdi deposits in Rajnandgaon district and Boria Tibbu deposits in Dalli-Rajhara area, Durg district. Bailadila-Rowghat hill ranges in the State are considered to be one of the biggest iron ore fields in India. **Limestone** occurs in Bastar, Bilaspur, Durg, Janjgir-Champa, Kawardha (Kabirdham), Raigarh, Raipur & Rajnandgaon districts; **quartzite** in Durg, Raipur, Rajnandgaon & Raigarh districts; and **talc/soapstone/steatite** in Durg & Kanker districts.

Other minerals found in the State are **corundum** in Dantewada district; **diamond** and other gemstones in Raipur, Mahasamund & Dhamtari districts; **fire clay** in Bilaspur, Raigarh & Rajnandgaon districts; **fluorite** in Rajnandgaon district; **garnet** & **marble** in Bastar district; **emerald** & **gold** in Raipur district; **granite** in Bastar, Kanker & Raipur districts; **quartz/silica sand** in Durg, Jashpur, Raigarh, Raipur & Rajnandgaon districts; and **tin** in Bastar & Dantewada districts (Table - 1). The reserves/ resources of coal are furnished in Table - 2.

Exploration & Development

The details of exploration activities conducted by GSI, NMDC and State DGM during 2018-19 are furnished in Table - 3.

Production

Coal, bauxite, iron ore, tin conc., limestone and moulding sand are the major minerals produced in Chhattisgarh. The value of minor mineral's production is estimated as ₹ 907 crore for the year 2018-19. There was 89 reporting mines in 2018-19 in case of MCDR minerals (Table - 4).

Mineral-based Industry

The present status of each mineral-based industry is not readily available. However, the principal mineral-based industries in the organised sector in the State are furnished in Table - 5.

Table – 1 : Reserves/Resources of Minerals as on 1.4.2015: Chhattisgarh

Mineral	Unit	Reserves				Remaining resources								Total resources (A+B)
		Proved STD 111	Probable		Total (A)	Feasibility STD211	Pre-feasibility		Measured STD331	Indicated STD332	Inferred STD333	Reconnaissance STD334	Total (B)	
			STD121	STD122			STD221	STD222						
Bauxite	'000 tonnes	12537	218	2313	15068	15341	4570	46389	37264	12892	23483	18747	158687	173755
China Clay#	'000 tonnes	107	-	22	130	1272	765	1412	-	-	11422	-	14871	15001
Corundum#	tonne	-	-	-	-	100	310	188	-	-	288	-	885	885
Diamond	carat	-	-	-	-	-	-	-	-	-	1304000	-	1304000	1304000
Dolomite#	'000 tonnes	34465	48130	11623	94218	29294	80865	24512	150795	24412	511610	1950	823439	917657
Fireclay#	'000 tonnes	315	23	94	433	68	27	17	7180	3400	10435	-	21126	21558
Fluorite	tonne	-	-	-	-	65889	153132	9288	185485	5573	126088	-	545455	545455
Garnet	tonne	-	-	-	-	-	-	-	-	-	28800	-	28800	28800
Gold														
Ore (primary)	tonne	-	-	-	-	-	-	-	-	600000	4241033	-	4841033	4841033
Metal (primary)	tonne	-	-	-	-	-	-	-	-	1.8	3.71	-	5.51	5.51
Graphite	tonne	6111	-	-	6111	1230	-	-	-	-	-	-	1230	7341
Granite## (Dim. stone)	'000 cu m	-	-	-	-	-	-	-	-	-	50057	-	50057	50057
Iron ore (Haematite)	'000 tonnes	1067636	78071	241730	1387437	255074	61735	47394	921139	613433	801086	770827	3470687	4858124
Iron ore (Magnetite)	'000 tonnes	8087	-	3096	11183	-	-	42	-	-	-	-	42	11225
Limestone	'000 tonnes	1025180	7128	145576	1177885	1071824	751825	427410	1332250	485933	5558135	-	9627377	10805262
Marble##	'000 tonnes	-	-	-	-	-	-	-	-	-	83000	-	83000	83000
Ochre	tonne	-	-	-	-	-	142	-	-	-	-	-	142	142
Quartzite#	'000 tonnes	605	1524	1567	3696	575	7035	1856	-	-	15404	-	24870	28566
Quartz-silica sand#	'000 tonnes	501	479	800	1780	389	282	789	56	26	642	7672	9856	11636
Talc/soapstone steatite#	'000 tonnes	22	-	8	30	-	-	-	-	70	8	-	78	108
Tin														
Ore	tonne	2067	897	1455	4419	1508	2017	72	168457	559914	29063288	-	29795255	29799674
Metal	tonne	44.56	94.02	15.62	154.20	917.02	342.02	16.85	813.29	209.43	13172.34	-	15470.95	15625.15

Figures rounded off.
 # Declared as minor mineral vide Gazette notification dated 10.02.2015.

Table – 2 : Reserves/Resources of Coal as on 1.4.2019 : Chhattisgarh

(In million tonnes)

Coalfield	Proved	Indicated	Inferred	Total
Total	**21446.29**	**36259.57**	**2201.90**	**59907.76**
Sohagpur	94.30	10.08	–	104.38
Sonhat	364.83	2303.81	1.89	2670.53
Jhilimili	228.20	38.90	–	267.10
Chirimiri	320.33	10.83	31.00	362.16
Bisrampur	1549.71	613.02	5.15	2167.88
East Bisrampur	–	164.82	–	164.82
Lakhanpur	455.88	3.35	–	459.23
Panchbahini	–	11.00	–	11.00
Hasdeo-Arand	2032.28	3273.42	223.12	5528.82
Sendurgarh	152.89	126.32	–	279.21
Korba	5877.26	5783.70	168.02	11828.98
Mand-Raigarh	10003.78	20803.93	1563.04	32370.75
Tatapani-Ramkola	366.83	3116.39	209.68	3692.90

Source: *Coal Directory of India, 2018-19.*

Table – 3: Details of Exploration Activities in Chhattisgarh, 2018-19

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq. km)	No. of boreholes	Meterage		
GSI							
Coal							
Raigarh	Jobro east block Mand-Raigarh Coalfield	1:10000	500	5	3633	-	G2 stage exploration for coal was carried out in Jobro east block, Mand-Raigarh Coalfield, Raigarh district. During study, an area of 5.00 sq. km was mapped on 1:10,000 scale and 5 boreholes to cumulative of 3,633.00 m were drilled. Seven regional Barakar coal seams / zones were intersected between 273.85 m and 732.40 m depth. Thickness of individual coal seam / zone was seen varying from 0.90 m (Seam III) to 39.90m (Seam VI+VII, MRJE-1, in 3 splits) and cumulative coal thickness showed variations from 48.35 m to 58.30 m. Seam zone VI+VII is the thickest one and was intersected between 339.60 m and 547.75 m in Boreholes No.4 and Boreholes No.2, respectively. Three coal seams were intersected within Raniganj Formation. Besides, a few local coal seams were also intersected within Barren Measures. Regional

i

(Contd)

Table - 3 (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							Barakar coal seams /zones have been traced for about 3 km along strike and 3.5 km along dip directions. The project will continue in field season 2019-20.
Raigarh	Kida block Mand-Raigarh Coalfield	1:10000	3.0	4	3041	-	In Raigarh district, G2 stage exploration for coal in Kida block, Mand-Raigarh Coalfield comprising Large sScale Mapping of 3.00 sq.km areas on 1:10,000 scale and total drilling of 3041 m in 4 boreholes was carried out. Twelve regional Barakar coal seams / zones (Seam I to X, XII and XIII in ascending order) were intersected between the depths of 76.25 m to 804.90 m. Cumulative thickness of individual coal seam / zone showed variations from 0.72 m (Seam VIII, MRKD-1) to 28.67 m (Seam IV, MRKD-1A). Seam IV & I were the thickest seam, and were persistently intersected in all the completed boreholes. Seam-IV in multiple splits whereas Seam-I developed in single spilt were intersected between the depths of 502.73 m to 804.99 m. Barakar coal seams / zones extend for about 2.5 km along strike and 1.5 km along dip direction. The exploration will continue in field season 2019-20.
Iron Ore							
Mahasamund	In and around Gopalpur area	1:12500	100	-	-	8 bed rock samples	Reconnaissance survey (G4) for iron ore in and around Gopalpur area, Mahasamund district, was taken up. The project comprised Large Scale Mapping of 100 sq. km on 1:12,500 scale along with 50 cu.m pitting/trenching. In the area, the banded magnetite quartzite (BMQ) was found to occur as enclaves in granite gneisses at higher elevated area of Tonidongri, Bijepur, Khairkuta, Sapos and in Village Gaboud. Major occurrences of BMQ are located in the hill south of Bijepur (700 m X 400 m), west of Gaboud (300 m X 200 m), in a mound north of Sapos (200 m X 30 m) and in the western side of Tonidongri hill near Gopalpur-7 (600 m X 30 m). Major element chemistry of the representative (Contd)

Table - 3 (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							BIF samples showed that SiO_2 and Fe_2O_3 constituted nearly 93.35% of the bulk of the banded iron formations. Eight bedrock Samples of BMQ yielded up to 59.82% of Fe_2O_3 content with an average of 47.72% SiO_2 and Fe_2O_3 content of the studied banded iron-formations showed negative correlation with SiO_2. Average contents of SiO_2, Al_2O_3, CaO, MgO, Na_2O, K_2O, MnO, TiO_2, P_2O_5 analysed in surface samples were 45.63%, 0.066%, 1.58%, 2.28%, 0.0386%, <0.05%, 0.093%, <0.1%, and 0.04%, respectively.
Molybdenum							
Balrampur-Ramanujganj	Shankargarh block eastern extension of Burhabagicha sulphide zone	1:12500	100	-	-	330	Reconnaissance survey for molybdenum, tungsten and associated base metal mineralisation was taken up in Shankargarh block, eastern extension of Burhabagicha sulphide zone, Balrampur-Ramanujganj district. During survey Large Scale Mapping for 100 sq. km area on 1:12,500 scale, along with collection of 300 bedrock and 30 petro-chemical samples was carried out. In the chert bands of calc-silicate rock near Village Bhadar, discrete small grain of scheelite was observed under UV light during night traverses. In meta-volcanic and meta-sedimentary rocks, rich dissemination of sulphide minerals, such as, pyrite, sphalerite, pyrrhotite, covellite, etc. were noticed in petrographic studies. The chemical analysis of bedrock samples did not show molybdenum or tungsten mineralisation. REE values for 40 bedrock samples ranged from 47.50 ppm to 512.98 ppm. Besides, in 129 bedrock samples the values of Cu varies from <10 ppm to 250 ppm, Pb range from <10 ppm to 80 ppm and Zn from 10 ppm to 500 ppm. Gold values of 169 bedrock samples were below detection limit. The arsenic values of 40 bedrock samples ranged from <1 ppm to 50 ppm.

(Contd)

Table - 3 (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Nickel							
Mahasamund	Bhalukona-Jamnidih block	1:12500	100	-	-	-	During reconnaissance survey for Ni, Cr and associated PGE mineralisation in Bhalukona-Jamnidih block, Mahasamund district, an area of 100 sq. km was systematically mapped on 1:12,500 scale and a total of five pyroxenite and 03 anorthositic gabbro bands were demarcated. The length of these bodies was found to vary from 50 m to 6 km (appx.) and width between <25 m and about 200 m. The analytical results of BRS samples from meta-ultramafites, gabbro and pyroxenite yielded anomalous values of Ni, Cr and Cu. Bedrock samples from Bhalukona area indicated Ni values up to 2,300 ppm, Cr values up to 2,700 ppm and Cu values up to 1,500 ppm whereas the analysis for gold yielded values up to 1.9 ppm in rhyolite near Chapiya area. The pyroxenite body in Chiprikona area that which was found to extends up to a strike length of 400 m with 50 m width yielded high Pd (1,174 ppb), Pt (241 ppb) and Ni (0.16%) values. Ore microscopic study revealed the presence of pyrrhotite, pentaldite, chalcopyrite and magnetite in silicate gangue of uralitised pyroxenite.
Diamond							
Kabirdham	Piparadhar and Maharajpur area	-	-	-	-	-	The reconnaissance survey was taken up with the objective to locate Kimberlite/Lamproite clan rocks in Piparadhar and Maharajpur area in parts of Kabirdham district. The area was found to expose rocks of Dongargarh Supergroup, Chilpi Group, Chattisgarh Supergroup and Deccan Trap and was found to contain 1,100 ppm of Cr 205 ppm of Ni concentration indicating ultramafic nature. In Maharajpur area, a total of 17circular to semi-circular intrusive bodies were observed. Carbonate veinlets of width about 35-45 cm and length up to 10 meters cross-cutting Nandgaon andesite/ andesitic-basalt were noted as sulphide- bearing. Pyroclastic breccia with angular

(Contd)

Table - 3 (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							and fragmented Ilmenite crystals have been observed at river section. At Piparadhar area, ultrabasic rock with conspicuous heavies have been spotted at river sections.
Gold							
Jashpur	Barjor area Sabadmunda & Telangana	1:12500	100	-	-	-	During reconnaissance survey for gold and associated sulphide mineralisation, an area of 100 sq. km was mapped on 1:12,500 scale in Barjor block. The area exposes granite with enclaves of meta-gabbro with numerous networks of sheared ferruginised tourmaline-bearing quartz veins and milky white quartz veins. The mineral assemblage indicates that the rocks have undergone regional metamorphism in greenschist to lower amphibolite facies. Quartz veins exposed near Barjor, Sabadmunda and Tilanga area contains disseminated pyrite, chalcopyrite, covellite, malachite and arsenopyrite. The metagabbro and granite also contains disseminated pyrite and chalcopyrite. Strike length of the mineralised quartz vein varies from 1 km to 2 km with width variying from 3 m to 50 m. Analysis of bedrock samples indicated Au value up to 11 ppm with average 1,634 ppb in quartz vein and metagabbro. Also 0.28% Cu, 0.27% Pb and 8 ppm Ag values were detected from the quartz veins of the study area.
Glauconite							
Baloda Bazar	Girodh area	1:12500	100.0	-	-	-	G4 stage reconnaissance survey for glauconitic sandstone for its potash content was taken up in and around Girodh area within Kansapathar Formation. About 18 km long and ~0.35 to 4.5 km wide glauconitic horizon is represented by reddish brown and purple glauconitic quartz arenite. The glauconitic band showed glauconite of various sizes (0.5 mm to 2 mm) and shapes. Overall, the volume percentage of glauconite in the sandstone was found to vary from 0.5 to >15%, the average value being 4-6%. Analytical data

(Contd)

Table - 3 (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							of some samples showed K_2O value up to 5.84% in BRS samples. Enriched mineralised zones of glauconite was identified around west of Uprani, Girodh, south of Girodh, north of Manakoni, NNW of Daldali, North of Gindola in Kansapathar Formation. Sulphide mineralisation like pyrite, chalcopyrite and arsenopyrite was identified in meta-basalt and gabbro in the north of Village Kunkuri and in amphibolite near Village Maharaji. Gold grain observed in sandstone near Village Bhadora. BIF band was noticed near Village Kukrikona at the southern boundary of the block. Sulphide mineralisation was noticed in black limestone near Motipur and Bareli villages.
Raipur	Around Kareli Khurd, Shuklabhata & Panduka area Gariaband & Dhamtari	1:12500	100.0	-	-	-	The LSM of 100 sq. km area on 1:12,500 scale revealed granitic basement, basal arkoses of Lohardih Formation and glauconitic sandstones of Kansapathar Formation The continuous belt of glauconitic sandstone was observed in the south central and central part of study area that passes through Bondrabandha, Atarmara, Kumharmarra, Sankra and Phuljhar. East of Kutena and in south of Phuljhar, glauconite was observed to form distinct beds of green colour parallel to the bedding of the host rock. Partly altered glauconitic pellets were also observed. The maturity of glauconite is mostly nascent, i.e., 2-4% K_2O throughout the study area. At Kumharmarra and Sankra, the glauconite variety was intermediate i.e. 4-6% K_2O while at Kutena and Phuljhar, the variety appeared mature i.e. (>6% K_2O). Petrographic studies showed feldspar replaced by glauconite. Analytical results of 50 bedrock samples showed K_2O values mostly in the range of 0.19-1.86 wt. % except 3 samples which showed variation between 2.12 and 3.32 wt.%. Petrochemical

(Contd)

Table - 3 (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							study of 8 samples showed K_2O values ranging from 0.1-3.41 wt. Analytical results of 8 pit and trench samples showed K_2O values ranging from 0.1-3.41 wt. % and these do not corroborate with the observed modal proportion of glauconite in the field study. Relatively better values were reported from XRD samples, which showed glauconite varying between 7 and 9%. The origin of glauconite could be attributed to replacement of feldspar in a stable shelf environment.
Graphite							
Balrampur	Baharchura, Tikidiri, Revatipura & Oranga area	1:12500	100.0	-	-	-	G4 stage reconnaissance survey for graphite in Baharchura, Tikidiri, Revatipur and Oranga area involved Large Scale Mapping followed by 75.65 cu. m trenching and 10 L km geophysical survey along with collection of other samples. Graphite mica schist occurs as a continuous band with minimum width of 3 m near Village Oranga to a maximum of 130 m near Village Revatipur. Graphite of flaky nature was found to be present in the area. Graphite mica schist samples analysis showed fixed carbon content varying from 4.51 to 16.27%, volatile matter varying from 1.24 to 3.94%, ash content from 80.15 to 91.88%, and moisture content from 0 to 0.94%.
Limestone							
Kabirdham	Bhikuria-Chhanta block	1:4000	4.0	10	320.0	235	G2 stage general exploration for limestone was carried out in Bhikuria-Chhanta block. Ten vertical boreholes at 400 m x 400 m grid pattern were drilled to a depth range of 30 m to 50 m for augmentation of resource. A few exposures of stromatolitic limestone were noticed in the eastern side of the block and in the periphery of the study area, i.e., Birutola, Dhamki, Nawapara, Bhikuria and Sohagpur village. Limestone was intersected at depths ranging from 4.5 m to 14.35 m and the thickness of limestone showed variations from 9 to 45.50 m. Silty shale

(Contd)

Table - 3 (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							intercalations/patches were intersected within the limestone. A total of 204 core samples and 5 bedrock samples were analysed for major oxides viz. SiO_2, Al_2O_3, Fe_2O_3, CaO, MgO, Na_2O, K_2O, P_2O_5, MnO, TiO_2, LOI. Besides, 10 petrochemical samples (PCS) were analysed for study of whole rock chemistry. Five XRD samples were also processed. Five water samples were also collected from the Bhikuria Chhanta block for analysis. For petrographic studies, 5 samples were collected and one sample was collected for beneficiation study. Study will continue in field season 2019-20.
Rajnandgaon	Sandi block	1:4000	5.6	34	550.1	995	G2 stage general exploration for limestone in Sandi block was carried out with an objective to assess limestone in this block. The block comprises stromatolitic limestone. The stromatolitic rings vary in size from about 0.5 cm to about 10 cm in diameter. During exploration work, an area of 5.6 sq. km was covered by detailed mapping on 1:4,000 scale. The drilling was carried out in 34 boreholes in a grid pattern at an interval of 400 m that included 20 boreholes with an average depth of 35 m. A total of 13 boreholes up to a depth of 60 m and one borehole up to a depth of 70 m were drilled in order to ascertain the thickness of limestone horizon in the area. Besides this, 5 BRS, 10 PCS, 5 XRD, 969 core samples, 6 water samples were collected and submitted for analysis. Chemical analysis results of core samples from 14 boreholes showed wide range of variation in SiO_2 (5.69% to 64.16%), Al_2O_3 (0.79% to 17.13%), Fe_2O_3 (0.49% to 9.01%), CaO (0.32% to 50.19%), MgO (0.98% to 13.52%), and P_2O_5 (0.01% to <0.04%). The project will continue in field season 2019-20.

(Contd)

Table - 3 (Contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
DGM, Chhattisgarh							
Bauxite							
Surguja	Sarbhanja block, Mainpat tehsil	1:4000	0.78	26	278.1	390	During 2018-19, G2 level exploration for bauxite in Sarbhanja block, Mainpat tehsil, Surguja district, Chhattisgarh was continued from previous field session. Exploration involved mapping of 0.78 sq. km on 1:4,000 scale; drilling of 278.10 m in 26 boreholes; pitting of 18 cu. m and collection of 390 samples. Resources estimated under Indicated Category were at 0.437 million tonnes.
	Dumarguda bauxite block	1:4000	2.39	39	447.9	536	In Dumarguda bauxite block, Surguja district, an area of 2.39 sq.km was mapped on 1:4000 scale. A total of 39 boreholes were drilled to a cumulative depth of 447.90 m and 536 samples were collected for analysis. The total resources estimated was at about 7.77 million tonnes underInferred category.
	Dandkesra north bauxite block	1:4000	2.35	34	365.40	400	During G3 level exploration in Dandkesra north bauxite block, Surguja district, an area of 2.35 sq. km was mapped on 1:4,000 scale, 34 boreholes to a cumulative depth of 365.40 m were drilled and 400 samples were collected for chemical analysis. The total resources estimated was at about 6.87 million tonnes (UNFC code 333).
	Parpatia bauxite block	1:4000	5.02	122	1540.60	1608	In Parpatia bauxite block, Mainpat tehsil, Surguja district, a G3 level exploration (NMET Project) involved mapping of 5.02 sq. km area on 1:4,000 scale; drilling of 122 boreholes to a cumulative depth of 1,540.60 m and collection of 1,608 samples for analysis. The total resources estimated was at about 12.62 million tonnes (UNFC code 333).
Limestone							
Bhatapara-Balodabazar	Sarseni-Guma area	1:50000 1:4000	220.00 2.34	20	1096.50	1040	The tentative resources estimated were at about 180.47 million tonnes. Investigation will continue.

(Contd)

Table - 3 (Concld)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Raigarh	Khairaha block Sarangarh tehsil	1:4000	5.00	8	150.70	98	The Inferred category resources have been estimated at about 68.80 million tonnes which include 18.40 million tonnes of cement grade (CaO >44%) and 50.40 million tonnes of cement (beneficiable/ blendable) grade (CaO 38% to 41%).
	Kamardih block, Sarangarh tehsil	1:4000	5.25	11	274.00	132	The Inferred category resources have been estimated at about 107.59 million tonnes which include 28.49 million tonnes of cement grade (CaO >44%) and 79.10 million tonnes of cement (beneficiable /blendable) grade (CaO 38% to 41%).
Bastar	Ichhapur area	1:4000	2.07	28	1122.00	326	The mineralised area for limestone was found to extend for a strike length of 1.5 km and depth persistence recorded was for a drilled depth of 54.00 m. The total tentative resources estimated in the area is about 120.00 million tonnes. G3 level exploration has been completed.
MECL							
Bauxite							
Kabirdham	Seraipani Dadar block tehsil	1:2000	0.80	14	210.55	407	G2 level exploration in Seraipani Dadar block, Pandaria tehsil, Kabirdham district involved mapping of 0.80 sq. km area on 1:2,000 scale, drilling of 210.55 m in 14 boreholes and collection of 407 samples for chemical analysis. A total of 2.23 million tonnes net insitu bauxite resources have been estimated with an average grade of 31.61% Al_2O_3, 18.67% SiO_2, 26.93% Fe_2O_3 , 4.08% TiO_2 & 17.81% LOI at (+) 30% Al_2O_3 cut-off.
Limestone							
Raipur	Nahardih-Madhaipur block	1:10000	5.45	34	1467.00	1591	The resources were estimated at 77.84 million tonnes with 43.50% CaO, 1.71% MgO, 10.96% SiO_2,2.75% Al_2O_3, 1.54% Fe_2O_3 & 36.79% LOI under UNFC code 332.
CMDC							
Bauxite							
Surguja	Kudaridih, Narmadapur, Kamleshwarpur and Rupakhar Mines	1:1000	812	875	11154	6277	CMDC carried out exploration in four mines, i.e., Kudaridih, Narmadapur, Kamleshwarpur and Rupakhar in Surguja district. The exploration work comprised geological & geophysical mapping of 8.12 sq.km on 1:1,000 scale, collection of 6,277 samples and drilling of 11,154.0 meterage in 875 boreholes.

Table –4: Mineral Production in Chhattisgarh, 2016-17 to 2018-19 (Excluding Atomic Minerals)

(Value in ₹'000)

Mineral	Unit	2016-17			2017-18			2018-19 (P)		
		No. of mines	Quantity	Value$	No. of mines	Quantity	Value$	No. of mines	Quantity	Value$
All Minerals		**117**		**77594583**	**112**		**101070093**	**89**		**119832999**
Coal	'000t	-	138525	-	-	142546	-	-	161893	-
Bauxite	t	13	1954234	1365345	13	2558701	2199036	13	1532600	1573656
Iron Ore	'000t	17	33285	60676299	18	34418	81546969	18	34945	99949981
Tin Conc.	kg	6	12121	8736	6	16758	11347	5	21211	13839
Limestone	'000t	77	32156	8622865	71	36391	8652173	50	42411	9221079
Moulding Sand	t	4	27685	6623	4	7100	1804	3	14423	3889
Minor Minerals		-	-	6914715	-	-	8658764	-	-	9070555

Note : *The number of mines excludes Fuel and minor minerals.*

$ Excludes the value of Fuel minerals.

Table – 5 : Principal Mineral-based Industries

Industry/plant	Capacity ('000 tpy)
Aluminium	
Bharat Aluminium Co. Ltd (Unit I & II), Korba.	200# (Alumina) 570 (Aluminium)
(#Plants remained non-operational during the year).	
Cement	
ACC Ltd, Jamul, Distt Durg.	2400
Ambuja Cements Ltd, Bhatapara, Distt. Raipur.	3500
Bhilai Jaypee Cement Ltd, Bhilai, Distt Durg (G).	2200
Century Cement, Baikunth, Distt Raipur.	2100
Century Textile & Industires Ltd, Tandwa, Tilda	2400
Emami Ltd, Baloda Bazar, Distt Raipur	2500 3200 (clinkar)
Emami Ltd, Risda Baloda Bazar, Distt Raipur	2500
Emami Cement Ltd, Risda Baloda Bazar	3000
J. K. Laxmi, Durg	2.7
J. K. Laxmi Cement Ltd, Malpurikhurd, khasadhe, Dhamdha	2400

(Contd)

Table - 5 (Contd)

Industry/plant	Capacity ('000 tpy)
Lafarge India Pvt. Ltd, Arasmeta, Distt Janjgir-Champa.	1.8
Lafarge India Pvt. Ltd, Sonadih, Distt Raipur	550
NUVOCO Vistas Co. Ltd Sonadih Cement Plant, Rasedi, Baloda Bazar	1000
Shree Cement, Baloda Bazar, Distt Raipur	3000
Shree Cement Ltd, Khapradih Simga, Balrampur.	3000
UltraTech Cement Ltd, Hirmi, Distt Raipur.	**1900**
UltraTech Cement Ltd, Rawan, Distt Raipur.	2500
Chemical	
Indu Ragukul Food &	1.5 (Sodium Dicromate)
Chemical Pvt. Ltd,	2.7 (Sodium chromate)
Rajghatta, Kharsia	1.35 (Sodium sulphate)
Electrode	
Calcutta Electrode Pvt. Ltd, Bhanpuri, Raipur	7.40
Fertilizer	
BEC Fertilizers, Sirgitti, Distt Bilaspur	850000

(Contd)

Table - 5 (Contd)

Industry/plant	Capacity ('000 tpy)
Dharamsi Morarji Chemical Co. Ltd, Kumhari, Distt. Durg.	183 (SSP & H_2SO_4)
Khaitan Chemicals & Fertilizers Ltd, Distt Rajnandgaon.	66 (SSP) 49.5 (H_2SO_4)
Iron & Steel	
Bhilai Steel Plant, Bhilai	6334 (Sinters) 4700 (Pig iron) 3925 (crude/liquid steel) 30 (Refractory bricks)
Jindal Steel & Power Ltd, Raigarh	2500 (Sinters) 1320 (Sponge iron) 8600 (Crude/liquid steel)
Jayaswal NECO Industries Ltd, Siltara, Distt Raipur.	650 (Pig iron) 255 (Sponge iron) 1200 (pellets) 1200 (Steel)
Monnet Ispat & Energy Ltd, Naharpalli, Raigarh	962.3 (Sinters) 612.5 (Pig iron) 750 (MS billet) 450 (TMT Bar)
Sarda Energy & Minerals Ltd, (formerly Raipur Alloys & Steel Ltd), IGC, Siltara, Distt Raipur.	600 (Pellets) 360 (Sponge iron) 240 (Finished steel)
Shri Bajrang Power & Ispat Ltd, Borjhara, Distt Raipur.	210 (Sponge iron) 130 (Steel) 1200 (pellets)
Sponge Iron	
A.P.I. Ispat & Power Tech. Pvt. Ltd, Siltara Billets, Raipur	210
Alliance Integrated Metallics Ltd, Bemta, Distt Raipur.	500
Anjani Steel Ltd, Ujalpur, Distt Raigarh	108
Arti Sponge & Power Ltd, Siltara, Distt Raipur	60
Ambika Ispat (I) Pvt Ltd, Tarainal, Distt Raigarh	30
Baldev Alloys Pvt. Ltd, Siltara, Raipur	30
Bhagavati Power & Steel Pvt Ltd, Siltara, Distt Raipur	60
B.S. Sponge Pvt Ltd, Taraimal, Raigarh	90
Crest Steel & Power Pvt. Ltd, IGC Borai, Distt Durg	231
Devi Iron & Power Pvt Ltd, Tandira, Distt Raipur	90
Drolia Electro Steel Pvt Ltd, Siltara, Raipur	66
Euro Pratik Ispat Pvt Ltd, Charoda, Distt Raipur	30
Gravity Treksim Pvt Ltd, Siltara, Distt Raipur	30

(Contd)

Table - 5 (Contd)

Industry/plant	Capacity ('000 tpy)
Godavari Power & Ispat Ltd, Siltara, Distt Raipur	495 2100 (pellets)
Gopal Sponge & Power Pvt Ltd, Siltara, Distt Raipur	30
Gitanjali Ispat & Power Pvt Ltd, Sirgititi, Distt Bilaspur	10
GR Sponge & Power Ltd, Siltara, Distt Raipur	72
Shree Hare Krishna Sponge Iron Ltd, Siltara, Distt Raipur	12000
Jai Shree Balaji Steel Pvt Ltd (HEG Ltd), Borai, Distt Durg	120 (Sponge iron)
Hi-Tech Power & Steel Ltd, Parsada, Distt Raipur	60
Khetan Sponge & Infrastructure Pvt. Ltd, Sarora, Distt Raipur	30
Maa Kali Alloys (Ind.) Pvt Ltd, Pali, Distt Raigarh	60
MSP Steel & Power Ltd, Raigarh	192 900 (pellets)
Monnet Ispat & Energy Ltd, Hasaud, Raipur	300 250 (Semi-finished Steel) 150 (Finished Steel)
Monnet Ispat & Energy Ltd, Naharpalli, Raigarh	500
NR Sponge Pvt. Ltd, Raipur	90
Nalwa Steel & Power Ltd, Taraimal, Raigarh	198
Nakoda Ispat Ltd, Siltara, Raipur	171
Niros Ispat Pvt. Ltd, Hathkhoj, Bhilai	97.5
Nova Iron & Steel Ltd, Dagori, Bilaspur	150
Nutan Ispat & Power Ltd, Jaroda, Raipur	60
PD Industries Pvt. Ltd, Siltara, Raipur	60
Prakash Industries Ltd, Hathenewra, Janjgir-Champa	1000
Raigarh Ispat & Power Ltd, Delari, Distt Raigarh	60
Rameswaram Steel & Power Ltd, Gharghoda, Distt Raigarh	72
Real Ispat and Power Ltd, Borjhara, Raipur.	60 460 (Finished Steel)
Sarda Energy & Minerals Ltd, Mandhar, Raipur	150
Hanumant Alloys (India) Pvt. Ltd, Hardikala, Distt Bilaspur	16.5
Shivalaya Ispat & Power Pvt Ltd, Guma, Distt Raipur	90

(Contd)

Table - 5 (Contd)

Industry/plant	Capacity ('000 tpy)
Shivshakti Steel Pvt. Ltd, Chakradharpur, Distt Raigarh	97.5
Shree Shyam Ispat (India) Pvt. Ltd, Taraimal, Raigarh	120
Singhal Enterprises Pvt Ltd, Taraimal, Distt Raigarh	253.5
Singhal Energy Pvt. Ltd, Taraimal, Raigarh	*60*
Sree Nakoda Ispat Ltd, Siltara, Distt Raipur	66
Sunil Sponge Iron Ltd, Chiraipani, Distt Raigarh	60
Sunil Sponge Pvt. Ltd, Munrethi, Dharsiwa	60
Topworth Steel Pvt Ltd, Rasmada, Distt Durg	165
Trimula Sponge Iron Pvt Ltd, Siltara, Raipur	30
Vandana Global Ltd, Siltara, Distt Raipur	216
Vasvani Industries Ltd, Siltara, Distt Raipur	90
Vidhyan Minerals India Pvt. Ltd, Bilaspur	30
Ferro Alloys	
Alok Ferro Alloys Ltd, Urla, Raipur	18
Deepak Ferro Alloys Ltd, Urla, Distt Raipur	5
Indsil Energy & Electro Chemical Ltd, Urla, Distt Raipur	19.2

(Contd)

Table - 5 (Concld)

Industry/plant	Capacity ('000 tpy)
Hira Ferro alloys Ltd, Urla, Distt Raipur	61.5
Jindal Steel & Power Ltd, Kharsia, Distt Raigarh	36
Sarda Energy & Minerals Ltd, (merged Chhattisgarh Electricity Co. Ltd) Siltara, Distt Raipur	600(Pellets) 360(Sponge Iron) 410(Finished Steel) 150 (Silico & Ferro- maganese
Nav-chrome Ltd, Urla, Distt Raipur	50
Orion Ferroalloy Pvt. Ltd Punjipathra, Gharghora	8
V. A.Power & Steel Pvt. Ltd Punjipathra, Gharghoda Manganese Oxide	8.1(Fe-Si) 14.4(Si-Mn)
Vandana Allied Minerals and alloy Bodegaon, Durg	3.6
Refractory	
SAIL Refractory Unit (formerly Bharat Refractories Ltd), Bhilai, Distt Durg	60
Vishva Vishal Engineering Ltd, Bhilai, Distt Durg	8.2

***(G)**; Grinding Unit*

***Note:** Data, not readily available for fertilizer and cement industries on respective websites, is taken from Indian Fertilizer Scenario, FAI Statistics, and Survey of Cement Industry & Directory, respectively.*

 # plant remained unoperational during the year