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(Part-I)

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STATE REVIEWS (Karnataka)

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GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES

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KARNATAKA

Mineral Resources

Karnataka has the distinction of being the principal gold producing State in the country. The State is the sole producer of felsite and one of the leading producer of iron ore, chromite, dolomite, dunite, kyanite and shale. Karnataka hosts the country's 79% vanadium ore, 72% iron ore (magnetite), 65% corundum, 42% tungsten ore, 36% asbestos, 27% limestone, 21% gold ore (primary), 20% granite (dimension stone), 20% manganese ore, 17% dunite, 13% kyanite and 10% PGM (metal) resources.

The important mineral-occurrence found in the State are **bauxite** in Belagavi, Chikkamagaluru, Uttara & Dakshina Kannada and Udupi districts; **china clay** in Bengaluru, Belagavi, Ballari, Bidar, Chikkamagaluru, Dharwad, Gadag, Hassan, Haveri, Kolar, Uttara & Dakshina Kannada, Shivamogga & Tumakuru districts; **chromite** in Chikkamagaluru, Hassan & Mysuru districts; **dolomite** in Bagalkot, Belagavi, Vijayapura, Chitradurga, Mysuru, Uttara Kannada and Tumakuru districts; **dunite/pyroxenite** in Chikkamagaluru, Hassan and Mysuru districts; **felspar** in Bengaluru, Belagavi, Chitradurga & Hassan districts; **fireclay** in Bengaluru, Chitradurga, Dharwad, Hassan, Kolar, Shivamogga & Tumakuru districts; **gold** in Chitradurga, Dharwad, Gadag, Kalaburagi, Hassan, Haveri, Kolar, Raichur & Tumakuru districts; **iron ore (haematite)** in Bagalkot, Ballari, Vijayapura, Chikkamagaluru, Chitradurga, Dharwad, Gadag, Uttara Kannada, Shivamogga & Tumakuru districts; **iron ore (magnetite)** in Chikkamagaluru, Hassan, Uttara & Dakshina Kannada and Shivamogga districts; **kyanite** in Chikkamagaluru, Chitradurga, Coorg, Mandya, Mysuru, Shivamogga & Dakshina Kannada districts; **limestone** in Bagalkot, Belagavi, Ballari, Vijayapura, Chikkamagaluru, Chitradurga, Davangere, Gadag, Kalaburagi, Hassan, Mysuru, Uttara & Dakshina Kannada, Shivamogga, Tumakuru & Udupi districts; **magnesite** in Coorg, Mandya & Mysuru districts; **manganese ore** in Belagavi, Ballari, Chikkamagaluru, Chitradurga, Davangere, Uttara Kannada, Shivamogga & Tumakuru districts; **ochre** in Ballari and Bidar districts; **quartz/silica sand** in Bagalkot, Bengaluru, Belagavi, Ballari, Chikkamagaluru, Chitradurga, Davangere, Dharwad, Gadag, Kalaburagi, Hassan, Haveri, Kolar, Koppal, Mandya, Mysuru, Uttara & Dakshina Kannada, Raichur, Shivamogga, Tumakuru & Udupi districts; **Quartzite** in Belagavi district; & **talc/steatite/soapstone** in Ballari, Chikkamagaluru, Chitradurga, Hassan, Mandya, Mysuru, Raichur & Tumakuru districts.

Other minerals that occur in the State are **asbestos** in Chikkamagaluru, Hassan, Mandya, Mysuru and Shivamogga districts; **barytes** & **pyrite** in Chitradurga district; **calcite** in Belagavi, Vijayapura & Mysuru districts; **copper** in Chikkamagaluru, Chitradurga, Kalaburagi, Hassan, Uttara Kannada, Raichur & Shivamogga districts; **corundum** in Bengaluru, Ballari, Chitradurga, kodagu, Hassan, Mandya, Mysuru & Tumakuru districts; **fuller's earth** in Belagavi & Kalaburagi districts; **granite** in Bagalkot, Bengaluru, Bellari, Vijayapura, Chamrajanagar, Chikkamagaluru, Chitradurga, kodagu, Dharwad, Gadag, Kalaburagi, Hassan, Kolar, Koppal, Mandya, Mysuru, Uttara & Dakshina Kannada, Raichur, Tumakuru & Udupi districts; **graphite** in Kolar & Mysuru districts; **gypsum** in Kalaburagi district; **molybdenum** in Kolar & Raichur districts; **nickel** in Uttara Kannada district; **Platinum Group of Metals** in Davangere district**; sillimanite** in Hassan, Mysuru & Dakshina Kannada districts; **silver** in Chitradurga & Raichur districts; **titanium minerals** in Hassan, Uttara Kannada & Shivamogga districts; **tungsten** in Gadag, Kolar & Raichur districts; **vanadium** in Hassan, Uttara Kannada & Shivamogga districts; and **vermiculite** in Hassan, Mandya & Mysuru districts (Table - 1).

Exploration & Development

The details of exploration activities conducted by GSI for copper , diamond & nickel and also by various agencies (MECL) during 2019-20 are furnished in Table - 2.

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

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						
Asbestos	tonne	-	-	-	-	-	-	-	-	2441037	5841420	-	8282457	8282457
Barytes#	tonne	-	-	-	-	78296	136220	14252	-	-	15175	-	243943	243943
Bauxite	'000 tonnes	126	1123	3140	4389	2468	864	10	82	2220	35603	-	41246	45635
Calcite#	tonne	-	-	-	-	31800	-	15900	-	14400	51547	-	113647	113647
China clay#	'000 tonnes	330	472	-	802	1768	747	2683	220360	443	24803	6030	256834	257636
Chromite	'000 tonnes	315	340	72	727	300	230	96	-	20	259	-	905	1631
Copper														
Ore	'000 tonnes	314	-	557	872	64	-	2445	1750	6833	22701	-	33793	34665
Metal	'000 tonnes	3.52	-	4.19	7.71	0.49	-	16.04	22	65.77	117.49	-	221.79	229.50
Corundum	tonne	-	-	-	-	64920	756	53590	13	38	27575	52675	199566	199566
Dolomite#	000 tonnes	28609	5910	6093	40612	16264	6684	9202	8519	76244	455337	13482	585731	626344
Dunite#	000 tonnes	3074	18	189	3282	0	0	34	23909	-	4606	-	28549	31831
Felspar#	tonne	-	-	-	-	103675	73613	107055	25000	135133	177300	3900	625676	625676
Fire clay#	'000 tonnes	146	-	-	146	247	340	2003	-	226	8832	-	11648	11794
Fullers earth##		tonne	-	-	-	-	-	-	58200	-	551640	1557156	-	2166996
Gold														
Ore (Primary)	tonne	10395000	2499000	422100	13316100	1270536	1303000	1078661	24979968	8204595	16020324	37673000	90530084	103846184
Metal (Primary)	tonne	53.34	7.77	0.42	61.53	5.24	3.85	8.53	120.73	28.67	38.29	43.78	249.09	310.62
Granite## (Dimension Stone)	'000 cum	26363	19389	21836	67587	-	-	-	238	1231625	8012784	25659	9270306	9337893
Graphite	tonne	-	-	-	-	140827	18750	48821	-	41605	149403	-	399406	399406
Gypsum#	'000 tonnes	-	-	-	-	-	-	-	-	-	3784	-	3784	3784
Iron Ore (Haematite)	'000 tonnes	416684	46169	87394	550247	518155	48231	211632	248299	44094	669239	176956	1916607	2466854
Iron Ore (Magnetite)	'000 tonnes	319	127	-	446	120022	-	18375	1498957	479372	5345018	340000	7801744	7802190
Kyanite	tonne	-	-	-	-	637460	15930	113630	386247	1610502	10531529	-	13295298	13295298
Limestone	'000 tonnes	461049	2154	1113795	1576998	497136	559903	1355522	1572501	13920771	34952588	-	52858420	54435419
Magnesite	'000 tonnes	1264	125	-	1389	566	190	391	88	10	3179	168	4592	5981

(Contd.)

Table-1 (Concld.)

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						
Manganese ore	'000 tonnes	9196	-	150	9346	14003	10225	11430	1498	7306	54333	2923	101718	111064
Molybdenum Ore	tonne	-	-	-	-	-	-	-	-	-	1320900	-	1320900	1320900
Contained MoS_2	tonne	-	-	-	-	-	-	-	-	-	1718.70	-	1718.70	1718.70
Nickel Ore	million tonnes	-	-	-	-	-	-	-	-	-	0.23	-	0.23	0.23
Ochre	tonnes	-	-	-	-	-	-	1766367	-	-	-	20000	1786367	1786367
Pt. Group of Metals	tonne	-	-	-	-	-	-	-	-	-	-	1.50	1.50	1.50
Pyrite	'000 tonnes	-	-	-	-	-	-	-	-	-	3000	-	3000	3000
Quartzite#	'000 tonnes	231	-	-	231	69	48	592	-	-	4914	1730	7353	7584
Quartz-Silica Sand#	'000 tonnes	7975	417	1807	10199	15904	6695	9448	94	52	52077	525	84794	94993
Sillimanite	tonne	-	-	-	-	-	-	-	-	-	982725	-	982725	982725
Silver														
Ore	tonne	10620000	1730000	-	12350000	-	-	69462	-	-	314150	-	383612	12733612
Metal	tonne	2.71	0.24	-	2.95	-	-	0.48	-	-	2.92	-	3.40	6.35
Talc-Steatite-Soapstone#	'000 tonnes	46	53	182	280	58	78	251	11	208	1196	-	1800	2081
Tungsten														
Ore	tonne	-	-	-	-	-	-	-	15361152	11805499	172921	9338246	36677818	36677818
Contained WO_3	tonne	-	-	-	-	-	-	-	2915	1775	142	1403	6235	6235
Vanadium														
Ore	tonne	-	-	-	-	-	500000	4000000	-	-	14884430	-	19384430	19384430
Metal	tonne	-	-	-	-	-	700	5600	-	-	43197.55	-	49497.55	49497.55
Vermiculite	tonne	-	-	-	-	13550	22520	29450	-	1562	66658	-	133740	133740

Figures rounded off.

 # Declared as minor mineral vide Gazette notification dated 10.02.2015.

Minor mineral before Gazette notification dated 10.02.2015.

Table –2 : Details of Exploration Activities in Karnataka, 2019-20

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq. km)	No. of boreholes	Meterage		
GSI							
Iron Ore							
Bellary	In 13/1 north and, south blocks, Ramanadurga, Sandur Schist belt	1:2000	0.62	-	-	-	Reconnaissance Survey (G4) for Iron Ore was carried out. During this period 0.62 sq km area was covered by detailed mapping on 1:2000 scale. Samples were not collected as permission for sample collection was denied by DCF, Bellary. During mapping, four lithologies,i.e,laterite, iron ore, Banded Haematite Quartzite (BHQ) and shale were delineated. Shale which was found occur between two BHQ bands showed sharp contact with BHQ and gradational contact with laterite. Due to low competency it was seen occupying the valley portions of the block. NNW-SSE trending and NE dipping BHQ bands form the high ridges because of resistance to weathering. The drilling activity in blocks could not be initiated due to forest clearance issue. Banded Iron Formation acts as a protore and has been subjected to varying degree of supergene alteration forming economically viable ore deposits. The high-grade iron ore band was observed to be roughly 1 km long and 180-260 m wide. As the iron ore band is exposed on steep hill slope, the apparent thickness (180-260 m) of the iron ore band is more as compared to true thickness. The iron ore band was seen confined between two BHQ bands and it showed gradational contact with footwall as well as hanging wall BHQ and sharp contact with shale. The work was discontinued for F.S. 2019-20 due to non-availability of forest permission.
Manganese Ore, iron ore & cobalt							
Shimoga	Hittala and Gilalagundi area	1:12500	100	-	-	-	Reconnaissance survey (G4) for manganese, iron ore and associated cobalt mineralisation in this area was carried out by LSM on 1:12500 scale for an area 100.0 sq km. Quartz chlorite schist, con-

(contd)

Table –2 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							glomerate, ferruginous phyllite, banded iron formation, brecciated chert / cherty quartzite (± Mn/Fe), acid volcanics, argillite, dolerite dykes and quartz veins were observed in the area. Manganese mineralisation was hosted by brecciated chert / cherty quartzite (± Mn/Fe) and ferruginous phyllite.A Total of eight manganese mineralised zones / bands were identified. Most of the bands were lensoidal and in small pockets lacking appreciable length and width but two bands was found to show appreciable length and width. Low-grade iron ore zone with 33% average Fe content for 7.5 m width and a low-grade cobalt zone with 207 ppm average grade of Co for 2 m width were worked out. PCS showed the assay value of MnO from 25.80 to 27.27%.
Haveri and Davangre	Chikka Gonageri area	1:12500	100	-	-	-	Reconnaissance survey for Manganese, Iron ore, associated Cobalt and polymetallic mineralisation in this area was carried out by large scale mapping of 100 sq km on 1:12500 scale. The main lithologies mapped were older granitoids of Archean Age which was seen made of biotite and migmatite gneiss. Two thin mineralised BIF bands were demarcated on the eastern side of Village Chikkagonageri whereas 6 discontinuous bands of BIF were observed in the Madenahalli Reserved Forest of Haveri jurisdiction. Extreme hydrothermal brecciation and limonitisation was also observed in these bands. The Bands III and IV of Madenahalli RF were observed to show surficial indications of manganese and iron ores on the slope of the BMQ ridges in the form of pyrolusite and goethite. The visual estimation of these grab ore samples indicated low to medium-grade of manganese and iron.

(contd)

Table –2 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							Secondary mineralisation in the form of specks of pyrite and chalcopyrite were observed in the south-western part of the block. Amongst all the bands, the Band I and II of Chikkagonageri area with approx. 300 m strike length and 30 m width showed values of Mn ranging from 2.41% to 13.10%, Fe - 15.4% to 33.6%, Pb - 0.1% to 0.6% and Zn - 0.1% to 0.31% in the BRS samples.
Uttar Kanada	Devanmane and Gumlagadde areas, Ankola, Kumta and Sirsi Taluks	1:12500	100	-	-	92	**Reconnaissance survey (G4) for Manganese, Iron ore and associated Cobalt mineralisation in this area was carried out by large scale** mapping of 100 sq km on 1:12500 scale. The major lithounits exposed in the investigated area were laterite, Banded Iron Formation, phyllite, argillite, quartzite, grey granite, dolomite and basic dyke. Manganese mineralisation was seen associated with the Banded Iron Formation and manganiferous phyllite. The Mn mineralisation occurred mainly in the form of pyrolusite as oolitic, pisolitic and also massive in nature. At many places, powdery aggregate of Mn-rich mineralisation was also observed along the road cuttings. On the basis of geochemical results, 31 samples showed high values ranging from 24.122% to 61.544% Fe, 56 samples showed anomalous values ranging from 0.27% to 50.66% Mn and 5 samples showed high Co values ranging from 80 to 110 ppm.
Haveri	Masur-kanvi siddageri area	1:12500	100	-	-	-	Reconnaissance Survey (G4) was carried out for manganese and low-grade Iron ore with associated Cobalt mineralisation in ferruginous and manganiferous lithounits and associated rocks in Masur-Kanvi Siddageri area. The investigation included 100 sq km LSM on 1: 12500 scale. The block

(contd)

Table –2 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							under investigation belongs to Joldhal Formation. BIF bands were found to be oxidised, limonitised at places and showed good amount of fresh/ oxidised sulphide. Analysis of BIF yielded Cu values from 220-550 ppm and Zn values from 210 to 540 ppm. Ni enrichment was seen only in ultramafics (talc schist) with values of 1,350 and 1,660 ppm. Cr enrichment was observed especially in ultramafics with values ranging from 1,620 to 4,509 ppm in 06 samples. Only one sample of BIF and Fe phyllite showed Cr values of 1,620 and 2,325 ppm respectively. Quartz vein within meta-basalt showed Co and Mn values of 320 ppm and 7.6% respectively. The maximum value of Fe was 36.6% with an average of 13.01% from both BIF as well as Fe phyllite.
Gold							
Chitradurga	Lakkavanahalli block	1:1000	-	-	-	-	Preliminary Exploration (G3) for Gold in this area was carried out by detailed mapping on 1:1000 scale along with pitting, trenching and sampling. Besides a total of 20 Lkm of ground geophysical survey including magnetic, resistivity and IP methods were carried out for delineating concealed BIF bands. Auriferous BIF band having a strike length of 600 m with variable thickness ranging up to 7 m was identified. The mineralised zones were characterised by extensive wall rock alteration like sericitisation, chloritisation and silicification by veins/ veinlets of quartz and carbonates. Sulphides in the form of pyrite were present as disseminated specks, besides ubiquitous occurrence of limonitisation, goethitisation and jaspilisation. Available analytical results indicated the average Au values to be 0.50 g/t/5.4m, 0.36 g/

(contd)

Table –2 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							t/6m, 1.15 g/t/1m, 0.41 g/t/2m and 0.68 g/t/1m from trench nos-9, 10, 13, 14 and 15, respectively. Out of 30 numbers of SS, two samples yielded encouraging Au values of 58 ppb and 60 ppb, respectively and rest showed < 25 ppb.
Haveri	Devargudda	-	-	04	455	39	Preliminary exploration (G3) of Gold was carried out in this area. The main rock types exposed in this block consisted of thick sequence of meta-felsic tuff/meta-felsic volcanics, BIF (both BMQ and BHC), quartz sericite schist. Meta-felsic tuff/meta-volcanics were the predominant rock type occupying nearly 90% of the investigation area and was seen frequently interbanded and intercalated with BIF and quartz-sericite schist. Mineralisation was observed to be mainly controlled by remobilised hydrothermal veins of few mm to few cm thicknesses. Sulphide-Au mineralisation showed a close spatial relationship to zones of intense alteration. Four boreholes (BH-1, BH-3, BH-5 & BH-6) were completed with an achievement of 455 m and rest of the boreholes were under progress. Result of 39 BRS samples was obtained as on date and some of the positive Au values were found to be ranging from 3.86 ppm, 2.44 ppm, 920 ppb to 700 ppb.
Gulbarga	Jainapur block, Manglur Schist, belt,	1:1000	1.5	-	-	-	Preliminary exploration (G3) for Gold mineralisation in this area was carried out. by The study area formed the central part of Manglur Schist Belt of Eastern Dharwar Craton. An area of 1.50 sq km was taken for detailed mapping on 1:1000 scale along with trenching of 140 cu. m. The host rock containing gold mineralisation was generally fine-grained sheared amphibolite. In bedrock samples, gold value was reported up to 34 ppb. Two gold mineralised zones

(contd)

Table –2 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							were established in Trench no. KYJT-1. The thickness of Au mineralised Zone-I was 5 m with an average value of 1.1 ppm and Au mineralised Zone-II thickness was 3 m with an average value of 0.15 ppm. A total of 850.80 m drilling were done in eight boreholes. Borehole no. KYJ-1 intersected two Au mineralised zones. The gold mineralised Zone-I thickness was 5 m with an average value of 0.05 ppm Au, intersected from 72 to 77 m depth along the borehole. The gold mineralised Zone-II with a thickness of 7.5 m with an average value of 0.53 ppm of Au was intersected between 78 and 85.50 m depth along the borehole. Feeble gold mineralised zone was intersected in the Borehole no. BH-2 and BH- 4 having average gold values of, 0.20 ppm and 0.08 ppm respectively.
Chitradurga	Kallenahalli block	1:1000	1.74	6	782.4	-	Preliminary Exploration (G3) for Gold was carried out in this area. A total area of about 1.74 sq km were covered by detailed mapping on 1:1000 scale and drilling of 782.4 m was completed in 6 boreholes (all first level) from BH-1 to BH-6. Sulphide mineralisation was present in the form of dissemination along the foliation and also in the form of veins and patches at places in the altered meta-basalt, mainly in the form of pyrite-arsenopyrite-chalcopyrite. Au values in trench KTR-3 were 34 to 70 ppb and the soil sample no KCS-5 collected near the mineralised zone of .779 hill reported Au value of 340 ppb. Bedrock samples yielded Au value of 60 ppb to 433 ppb. Chemical results of Borehole BH-I established zones as of Zone-1 from 125.36 to129.49 m with 0.2 ppm average grade, Zone-2 from 133.84 to 138.95 m with 0.26 ppm average grade. The true

(contd)

Table –2 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							thickness of the Z-1 was 3.17 m and Z-2 was 4.34 m in BH-2, the maximum Au value analysed was 375 ppb. Cu reported highest value of 400 ppm from 96.6 to 97.1 m.
Chitradurga	Ramajogihalli area, in Chitradurga Schist Belt	1:1000	0.6	-	-	-	Reconnaissance Survey (G4) for Gold and associated elements in this area was carried out. The area forms a small part in the eastern periphery of Chitradurga Schist Belt. The narrow stretch along the eastern periphery consists of extremely sheared and impersistent bands and lenses of amphibolites, actinolite-chlorite schist and other ultramafic rocks. Detailed mapping was carried out around the quartz vein QV-4. A total of 0.6 sq km area around QV-4 was mapped on1:1000 scale. Chemical and analytical data showed that Au values ranged from 38 ppb to 1.49 ppm. Cu content in most of the samples ranged between 15 and 140 ppm. Three bedrock samples were analysed for Zn, Ni and Co values which ranged from 60 to 75 ppm, 80 to 135 ppm and 15 to 25 ppm, respectively.
Davanagere	Honnamardi block	-	-	05	868.47	284	Preliminary Exploration (G3) for Gold was carried out in this area. Exploratory drilling was carried out to fill the gap areas and to check the continuity of the mineralised Honnamardi lode at deeper level. Three 2nd level (120 m vertical depth) boreholes BH-3, BH-4 and BH-5 were drilled to check the continuity of gold mineralisation at deeper level and two 1st level boreholes BH-1 (100 m SW of HNB- 3) and BH-2 (100 m NE of HNB-1) were drilled to fill the gap areas in quartz veins QV- 1 and QV-2, respectively. A total of 868.47 m of drilling target has been achieved till date by drilling 05 nos. of boreholes which are BH-1 (1st level, depth 119.20 m), BH-2 (1st level, depth 140.55 m), BH-3 (2nd level, depth

(contd)

Table –2 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							197.22 m), BH-4 (2nd level, depth 209.55 m) and BH-5 (2nd level, depth 201.95 m). A total of 284 core samples were generated. The 188 core samples were sent for chemical analysis for gold. Received analytical result of 117 samples which showed discouraging values of gold. The highest gold value received was 410 ppb.
Bagalkot	Yalligutti and Mughlalli block	-	-	-	-	-	Reconnaissance survey (G4) for Gold and associated metals in this area was carried out. The investigated area exposed rocks of Hungund-Kushtagi schist belt of Dharwar Supergroup, granites equivalent to Closepet Granite as well as younger Proterozoic sedimentaries of Kaladgi Supergroup. Nine bedrock samples from Banded Magnetite/Haematite Chert bands have shown anomalous Au values up to 336 ppb. Trench samples near the zones yielded anomalous Cu (345 ppm max), Cr (1,575 ppm max), Ni (338 ppm max) and Zn (120 ppm max) values. Incidence of pyrite and chalcopyrite in quartz chlorite veins in BMHC and disseminations in massive meta-basalt (Ilkal Fm.) was reported. Surface manifestations of possible auriferous zones were marked by vein filling sulphides/ oxides (pyrite, chalcopyrite, bornite) and as secondary minerals pyrite, chalcopyrite, limonite and goethite.
Platinum Group Elements (PGE), Nickel and Gold							
Raichur and Kopal	Hungund Kushtagi schist belt	1:12500	-	-	-	-	Reconnaissance survey for Platinum Group Elements, Nickel and gold mineralization in Kalmangi Layered ultramafic complex and parts of Hungund Kushtagi schist belt, Raichur and Koppal districts, Karnataka (G4): large scale mapping on 1:12500 scale was carried out in the area along with

(contd)

Table –2 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							sampling during the course of investigation. The dominant rock types exposed belongs to Penninsular Gneissic Complex II, Hungund Kushtagi schist belt, Kalmangi ultramafic complex and Younger intrusive in the form of younger Granite, basic dykes and quartz veins. Highest values of gold and copper were obtained from smoky quartz vein (Au- 28 ppb) and meta-rhyolite (Cu- 1300 ppm) located west of Bhogapur village. The analytical values of total PGE in bedrock samples were ranging from 6 ppb (only Pd) to 161 ppb (150 Pt+11Pd). Details of mineralisation, if any, will be established after receiving of complete chemical analysis and lab studies.
Platinum group Elements and Nickel							
Chitradurg and Chikmanglur	Gollarhatti and Donnekoronahalli area Antarghatta mafic-ultramafic belt	-	-	51	3553.00	1166	Reconnaissance survey (G4) for Platnium Group Elements and Nickel was carried out in this area. The lithounits represented in the study area were fuchsite quartzite, amphibolite, pyroxenite, talc-tremolite schist, serpentinite, migmatite gneiss, granite gneiss, grey granite, gabbro and dolerite dykes and quartz vein. mineralisation was seen manifested in the form of magnetite and chromite hosted in serpentinite, talc-tremolite schist and pyroxenite. Surface alterations like oxidisation, reddish and yellow ochre were noticed in the serpentinite and talc-tremolite schist. Based on the surface manifestation of magnetite, chromite, sulphide mineralisation and surface alteration, three feeble narrow anomalous zones were identified.
Copper and Gold							
Raichur	Machanur Central block,	-	-	-	14	322.7	General exploration (G2) for Copper and Gold mineralisation was carried out in this area. The block forms part of the granitoid

(contd)

Table –2 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling	Remarks
		Scale	Area (sq km)	No. of boreholes	Meterage	(No.)	Reserves/Resources estimated
							terrain belonging to the Closepet Granite suite of intrusive granites and granodiorites. The mineralised zone in Machanur occurs in an ENE-WSW trending brittle fracture system stretching far about 5 km in length and 50-150 m in width within pink porphyritic granite. A Total 3,227 m drilling were completed in 14 boreholes (BH-09 to BH- 22) including 08 first level, 04 second level and 02 third level boreholes. All the drilled boreholes have intersected disseminated and vein-type mineralisation associated with the breccia zone. The mineralised zones were generally wide, with a maximum width of 90 m with Cu up to 3.0% (VE) in third level borehole BH-22. Analytical results for gold were awaited for all the boreholes except BH-09. The reserves/ resources will be calculated after receiving the analytical results of copper for all the drilled boreholes. In borehole BH-09 (level) only gold mineralisation was intersected i.e. (1) 0.2g/t Au x 24.4m (2) 0.1g/t Au x 4.35m and (3) 1.0g/t Au x 3m.
Rare Earth Element (REE)							
Koppal	Budihalu	1:4000	7	-	-	-	Preliminary exploration (G3) for Rare Earth Element (REE) mineralisation in regolith zones over pyroxenite and syenite rocks, of this area was carried out. The project involved detailed mapping of 7 sq km area on 1:4000 scale. The area is comprised of gneiss of PGC, syenite variant like porphyritic with rapakivi phenocryst and medium- grained syenite, phoscorite (clinopyroxenite) and later intruded units of gabbro, pegmatite and quartz vein. TREE value in the -200 fractions of regolith samples developed over phoscorite rock varied from 287.8 to 5,153.95 ppm. TREE value in the -200 fractions of regolith developed over syenite varied from 406.4 ppm, to 1,241.3 ppm, whereas in

(contd)

Table –2 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							the gneiss it was 463.8 ppm. All the samples showed LREE enriched than the HREE. High value of TREE was noticed over phoscorite which was rich in apatite content. Petrochemical results showed SiO_2 content in syenite variants varying from 57.09 to 58.70%, Al_2O_3 varying from 15.80 to 16.30%, Fe_2O_3 varying from 5.28 to 5.43%, Ba from 5,607 to 6,286 ppm, Sr from 1,526 to 1,643 ppm. Phoscorite showed SiO_2 content varying from 37.20 to 50.9 %, Al_2O_3 varying from 2.73 to 7.51%, Fe_2O_3 varying from 6.95 to 18.78 %, MgO varying from 2.3 to 10.62 %, CaO varying from 14.08 to 24.15%, P_2O_5 varying from 2.365 to 11.54%, Ba from 140 to 5,424 ppm and Sr varying from 581 to 1,224 ppm. Bedrock samples of phoscorite showed TREE values ranging from 796 to 8,019 ppm.
Chitradurga	Jamapanayakanajote - Sondekere block	-	100	-	-	-	Reconnaissance survey (G4) for REE mineralisation in this area has been carried out by mapping. An area of 100 sq km was mapped. Major lithounits mapped in the area were sheared granite gneiss (PGC-I), amphibolites (Javagonahalli Group), pillowed/ variolitic basalt (Hiriyur Formation of Chitradurga Group), diorite, meta-gabbro/meta-pyroxenite (pyroxenes are altered to amphibole), granite (younger intusive), carbonate pebble bed, quartz porphyry and intrusives (micro-gabbro, dolerite dykes, quartz reef/veins). From mineralisation point of view, neither REE mineralisation in study area nor any encouraging value was obtained in the available analytical results. However, significant occurrence of gold (BRS, N=10, 97 to 14,200 ppb), copper (field observation; specs of azurite, bornite, malachite, analytical results not available) and

(contd)

Table –2 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							molybdenum (BRS, N=03, 65 to 370 ppm) mineralisation were found to be present in hydrothermal alteration zone.
Nickel and Copper							
Chitradurga	Around Turuvanur and Kunabevu areas	1:2000	2	4	704.65	-	Reconnaissance survey (G4) for Nickel and Copper mineralisation in this area was carried out. The study included 2 sq km detailed mapping on 1:2000 and a total of 704.65 m scout drilling were completed in four boreholes BH-1, BH-2, BH-3 and BH-4. The mapped area comprised of mafic-ultramafic rocks, viz. gabbro/ anorthositic gabbro and serpentinised meta-pyroxenite which occur as intrusives within the Hiriyur Formation of Chitradurga Schist Belt. There was no surface indication of mineralisation observed in the field. But in core samples fine disseminations of sulphides within carbonate veins as specks were observed. Bedrock samples collected from BH-1 profile, analysed Ni values ranging from 920 to 21,200 ppm. Overall, Ni values ranged from 1,150 to 21,200 ppm in BRS and from 65 to 15,520 ppm in trench samples. High magnetic susceptibility zones were recorded in a few anomalous zones particularly over ultramafic unit with the help of Geophysical logging.
NMDC Karnataka							
Ballari	Kumaraswamy iron ore mine-B and C block	-	-	51	3553.00	1166	-
Donomalai		-	-	-	-	-	The total resources as on 1.4.2020 estimated at Donomalai mine was about 149 million tonnes.

(contd)

Table –2 (concld)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Hutti Gold Mines Company Limited (HGML)							
Raichur	Hutti	-	-	-	-	-	In Karnataka, HGML carried out exploration work in Hira-Buddinni Gold Mine, Village Hutti, Lingasugur taluka, Raichur district with an objective to explore the strike and depth continuity of existing reefs, presence/absence of footwall or hanging wall branches of the existing reefs and existence of any blind shoots. About 64.90 m of on-lode development work was carried out along with collection of 410 samples. The total estimated quantity of resources as on 01.04.2020 was about 0.33 million tonnes of ore with average grade of 3.10 g/t of metal including 0.68 million tonnes of ore with average grade of 3.62 g/t of metal under Reserve category. In Uti Gold Mine, Village Uti, Deodurga taluka, Raichur district, exploration work could not be taken up due to local issues. The total quantity of resources as on 01.04.2020 estimated in the mine was about 3.42 million tonnes of ore with average grade of 2.18 g/t of metal including 0.50 million tonnes of ore with average grade of 2.20 g/t of metal under reserve category. In Hutti Gold Mine, Village Hutti, Lingasugur taluka exploration was taken up with an objective to explore the strike and depth continuity of existing reefs, presence/absence of footwall or hanging wall branches of the existing reefs and existence of any blind shoots. Exploration work comprised drilling of 12 boreholes to a total depth of 619.00 m, collection of 10,788 samples and 3,396 m of on-lode development work in the mine. The estimated total resources in the mine was about 24.22 million tonnes of ore.
	Uti	-	-	-	-	-	

Production

Gold ore, Iron Ore, Manganese ore, Limestone, and Magnesite are the important minerals produced in Karnataka State. The value of minor mineral's production is estimated as 915 crores for the year 2019-20. There were 140 reporting mines in 2019-20 in case of MCDR of minerals. (Table-3).

Mineral-based Industry

The present status of each mineral-based industry is not readily available. However, the important mineral-based industries in organised sector in the State are formished in Table - 4.

Table – 3 : Mineral Production in Karnataka, 2017-18 to 2019-20 (Excluding Atomic Minerals)

(Value in ₹ '000)

Mineral	Unit	2017-18			2018-19			2019-20 (P)		
		No. of mines	Quantity	Value	No. of mines	Quantity	Value	No. of mines	Quantity	Value
All Minerals		**148**		**95961664**	**141**		**93955584**	**140**		**90438808**
Bauxite	t	2	-	-	-	-	-	1	-	-
Chromite	t	3	-	-	3	-	-	2	-	-
Gold Ore	t	-	545065	-	-	563519	-	-	591251	-
Gold	kg	3	1639	4738070	4	1661	5233808	4	1724	6431034
Iron Ore	'000t	57	28691	74742826	54	29823	71114250	60	31402	66546365
Manganese Ore	t	10	294261	1541069	11	332162	2276289	9	333425	2284994
Silver #	kg	-	173	6609	-	214	7785	0	187	8066
Graphite (r.o.m.) *	t	-	-	-	2	-	-	2	-	-
Kyanite	t	1	-	-	-	-	-	1	400	880
Limestone	'000t	68	30059	5725156	62	34378	6103939	57	34228	5965418
Limeshell	t	2	4537	12806	2	3538	10699	1	1017	3052
Magnesite	t	2	8419	42682	3	9108	56368	3	7198	46553
Minor Minerals @		-	-	9152446	-	-	9152446	-	-	9152446

Note: *The number of mines excludes Minor minerals.*
 # Recovered at Raichur and Tumkur during refining of gold.
** Only labour reported.*
@ Figures for earlier year have been repeated as estimates because of non-receipt of data.

Table – 4 : Principal Mineral-based Industries

Industry/plant	Capacity ('000 tpy)
Abrasives	
Grindwell Norton Ltd, Bengaluru.	NA
Alumina	
Hindalco Industries Ltd, Belagaum	350 (alumina) 40 (paste) 0.090 (Vanadium)
Cement	
ACC Ltd, Wadi (Wadi & Wadi New), Distt. Gulbarga	5450
ACC Ltd, Kudithini, Ballari (G).	1100

(contd)

Table - 4 (contd)

Industry/plant	Capacity ('000 tpy)
ACC Ltd, Thondebhavi, Distt. Chickballapur (G).	1660
Bagalkot Cement Industries Ltd, Distt. Bagalkot.	600
Chettinad Cement, Kallur, Distt. Kalaburagi.	2500
Dalmia Cement, Yadwad, Distt. Belagavi	4000 2600 (Clinker)
Heidelberg Cement India Ltd, (Formerly Mysore Cements Ltd) Ammasandra, Distt. Tumakuru.	510
J. K. Cement Ltd, Muddapur, Distt. Bagalkot	3000

(contd)

Table - 4 (contd)

Industry/plant	Capacity ('000 tpy)
JSW Cement, Vijaynagar, Distt. Ballari.	3200
Kesoram Industries, Vasavadatta Cement, Sedam, Distt. Kalaburagi	8565 (OPC) 8565 (PPC)
Kalaburagi Cement Pvt Ltd (formerly Viratsagar) Gulbargha, Distt. Kalaburagi	2750
Kalaburagi Cement Pvt Ltd Karchikhed, Chincholi	3500 2750 (Clinker)
Orient Cement Ltd.Itagi, Chittapur	3000
Ramco Cement Ltd, Mathodu, Distt. Chitradurga.	290
Shree Cement Ltd.Benekanahalli, Kodla Sedam,Gulbargha	3000
Ultratech Cement, Raj Shree Cement, Malkhed, Distt. Kalaburagi.	6100
Ultratech Cement, Ginigera, Distt. Koppal (G).	1300
Orient Cement Chittapur, Gulbargha	**3000**
Ceramic	
Ceramic Products Ltd, Khanapur, Distt. Belagavi.	NA
H&R Johnson (India) Ltd, Hubballi.	47.72
Murudeshwar Ceramics Ltd, Dharwad.	8.4 mill.sq m
The Mysore Spongware Pipes Potteries Ltd, Solandavanahalli, Bengaluru.	NA
Chemical	
Solaris Chem Tech Industries Ltd, Bhinga, Distt. Uttara Kannada.	59.4 (caustic soda), 52.3 (Cl), 133.7 (HCl) 24.0 (H_3PO_4)
Magnesium & Allied Product Hurugalavadi , Mandya	3 (Magnesium Carbonate) 1.875 (Magnesium Oxide)
Shivam Minerals , Honaga Belgaum	4.6(Magnesium Carbonate) 4.6 (Magnesium Oxide)
Fertilizer	
K. P. R. Fertilizers Ltd Halvarthi, Koppal.	60 (SSP)
Mangalore Chemical & Fertilizers Ltd, Panambur, Mangaluru.	379.5 (Urea) 260 (DAP) 40 (Complex)
Tungabhadra Fertilizers & Chemicals Ltd, Munirabad, Koppal.	45 (SSP)
Iron & Steel	
JSW Steel Ltd, Tornagallu Sandur Distt. Ballari	9200 (pellets) 12100 (pig iron) 12000 (crude/liquid steel) 12950 (sinter) 4618 (Coke)

(contd)

Table - 4 (contd)

Industry/plant	Capacity ('000 tpy)
Visvesvaraya Iron & Steel Ltd, Bhadravati, Distt. Shivamogga.	205 (pig iron) 118 (crude/liquid steel) 4.8 (refractory bricks)
Sunvik Steels Pvt. Ltd, Jodidevarahally, Distt. Tumakuru.	60 (sponge iron) 60 (TMT bar)
	36(-------)
Pellets	
BMM Ispat, Danapur, Distt. Ballari.	2400 (pellets)
KIOCL, Mangaluru	3500 (pellets) 6700 (conc.)
Minera Steel & Power Pvt. ltd., Sandur	600
SLR Metalliks Ltd. Narayan Devera Kera Hagari Bommanahalli	343.2 (Sinter)
Xindia Steel, Koppal.	800 (pellets)
Pig Iron	
Uni-Metal Ispat Ltd, Ballari.	75
Kalyani Ferrous Ind. Ltd, Koppal	500 (Sinter) 289.6
Kirloskar Ferrous Industries Ltd, Bevinahalli, Distt. Koppal.	500 (Sinter) 720
Mukund limited, Ginigera, Kopopal	500 (Sinter) 410.3
Sponge Iron	
Agrawal Sponge & Energy (P) Ltd, Kuduthini, Distt. Ballari.	90
Balakundi Premium Steels Pvt. Ltd, Halakundi, Distt. Ballari.	34
Bellary Ispat (P) Ltd, Halakundi Distt. Ballari.	52.5
Ballary Steel & Alloys Ltd, Ballari.	60
Benaka Sponge Iron Pvt. Ltd, Belagal, Distt. Ballari.	84
BMM Ispat Ltd., Danapur	600 2400 (pellet)
BRU Industries, Anekal Taluk	1.2 (cast Iron)
Dhruvdesh Metasteel Pvt. Ltd, Hirebaganal, Distt. Koppal.	72
Divya Jyoti Steel Ltd, Taranagar, Distt. Ballari.	30
Gayatri Metals Pvt Ltd, Belagal, Distt. Ballari.	5000
Hindustan Calcined Metal Pvt. Ltd., Janekunnte Ballari	60
Jairaj Ispat Limited, Belagal village	60
Haryana Steel and Power, Shanthigrama, Distt. Hassan.	35

(contd)

Table - 4 (contd)

Industry/plant	Capacity ('000 tpy)
Hare Krishna Metallics Pvt Ltd, Hire Baganal, Distt. Koppal.	144
Hospet Ispat Pvt. Ltd, Allanagar Bagnal Road, Distt. Koppal.	60
Hothur Ispat Pvt. Ltd, Veniveerpur, Distt. Ballari.	300 TPD
Minera Steel & Power Pvt. Ltd, Yerabanahally, Distt. Ballari.	120
M.S.Metals & Steels PVT. Ltd. Hirebagnal Koppal	105 109.5(TMT Bars)
Noble Distilleries & Powers Ltd, Sirivar, Distt. Ballari.	200 TPD
PGM Ferro Steel Pvt. Ltd, Hariganadani, Distt. Ballari.	60
Popuri Steels Ltd, Halakundi, Distt. Ballari.	30
Padmawati Ferrous Metal, Chikantpur Sandur, Ballari.	150
Rayon Steel Pvt. Ltd, Veniverapur, Distt. Ballari.	60
Rengineni Steel Pvt. Ltd, Halakundi, Distt. Ballari.	25.5
Shree Venkteshwara Sponge & Power Ltd, Halakundi, Distt. Ballari.	60

(contd)

Table - 4 (concld)

Industry/plant	Capacity ('000 tpy)
Yashshvi Steel & Alloys Ltd, Halakundi, Distt. Ballari.	30
Ferro alloys	
Ani Smelters Yaradakatla, Hariyur	1.5
Dandeli Steel & Ferro Alloys Ltd, Dandeli.	6
Padmawati Ferrous Metal, Chikantpur Ballari	30 5 (Ferro-manganese) 5 (Silico-manganse) 2 (Ferro-silicon)
Sandur Manganese & Iron Ore Ltd, Mariyammanahalli Hospet	36 (SiMn)
Refractories	
T.S.Ranganath & Company, Keshavapurahuliyar, Chikkanayakanahalli	1.0 (Clay tiles & Block)
S.R. Chemicals & Ferro Alloys Ltd, Honaga, Distt. Belagavi.	0.3
Thermit Alloys Pvt. Ltd, Shivamogga.	1.2
Petroleum Refinery	
MRPL, Mangaluru.	15000

G; Grinding Unit

Note: *Data for fertilizer and cement industries is taken from Indian Fertilizer Scenario, FAI Statistics, and Survey of Cement Industry & Directory, respectively.*