

STATE REVIEWS



# Indian Minerals Yearbook 2021

(Part- I)

60<sup>th</sup> Edition

**STATE REVIEWS  
(Madhya Pradesh)**

(ADVANCE RELEASE)

**GOVERNMENT OF INDIA  
MINISTRY OF MINES  
INDIAN BUREAU OF MINES**

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## MADHYA PRADESH

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### Mineral Resources

Madhya Pradesh is the only diamond producing State in the country and is the leading producer of copper conc., diaspore, pyrophyllite, manganese ore, limestone and clay (others). The State hosts the country's 90% diamond, 74% diaspore, 55% laterite, 48% pyrophyllite, 41% molybdenum, 27% dolomite, 19% copper ore, 18% fireclay, 12% manganese and 8% rock phosphate ore resources.

Important mineral occurrences in the State are: **bauxite** in Balaghat, Guna, Jabalpur, Katni, Mandla, Rewa, Satna, Shahdol, Shivpuri, Sidhi & Vidisha districts; **calcite** in Barwani, Jhabua, Khandwa & Khargone districts; **china clay** in Betul, Chhatarpur, Chhindwara, Gwalior, Hoshangabad, Jabalpur, Khargone, Narsinghpur, Raisen, Satna, Shahdol & Sidhi districts; **copper** in Balaghat, Betul & Jabalpur districts; **coal** in Betul, Shahdol & Sidhi districts; **diamond** in Panna district; **diaspore & pyrophyllite** in Chhatarpur, Shivpuri & Tikamgarh districts; **dolomite** in Balaghat, Chhindwara, Damoh, Dewas, Harda, Hoshangabad, Jabalpur, Jhabua, Katni, Mandla, Narsinghpur, Sagar & Seoni districts; **fireclay** in Betul, Chhindwara, Jabalpur, Katni, Narsinghpur, Panna, Sagar, Shahdol & Sidhi districts; **iron ore (haematite)** in Betul, Gwalior, Jabalpur & Katni districts; **limestone** in Balaghat, Chhindwara, Damoh, Dhar, Hoshangabad, Jabalpur, Jhabua, Khargone, Katni, Mandla, Morena, Narsinghpur, Neemach, Rewa, Sagar, Satna, Sehore, Shahdol & Sidhi districts; **manganese ore** in Balaghat and Jhabua districts; **ochre** in Dhar, Gwalior, Jabalpur, Katni, Mandla, Rewa, Satna, Shahdol & Umaria districts; **pyrophyllite** in Chhatarpur, Sagar, Shivpuri & Tikamgarh districts; **quartz/silica sand** in

Balaghat, Dewas, Dhar, Jabalpur, Khandwa, Khargone, Morena, Rewa & Shahdol districts; **talc/steatite/soapstone** in Dhar, Jabalpur, Jhabua, Katni, Narsinghpur & Sagar districts and **vermiculite** in Jhabua district.

Other minerals that occur in the State are: **barytes** in Dewas, Dhar, Shivpuri, Sidhi & Tikamgarh districts; **calcareous shales** (used in slate pencil) in Mandla district; **felspar** in Jabalpur & Shahdol districts; **fuller's earth** in Mandla district; **gold** in Jabalpur & Sidhi districts; **granite** in Betul, Chhatarpur, Chhindwara, Datia, Jhabua, Panna, Seoni & Shivpuri districts; **graphite** in Betul & Sidhi districts; **gypsum** in Shahdol district; **lead-zinc** in Betul district; **molybdenum** in Balaghat district; **potash** in Panna district; **quartzite** in Sehore district; **rock phosphate** in Chhatarpur, Jhabua & Sagar districts; and **sillimanite** in Sidhi district (Table - 1). The reserves/resources of coal along with various coalfields in Madhya Pradesh are furnished in Table - 2.

### Exploration & Development

The details of exploration activities conducted by GSI and other various agencies during 2020-21 are furnished in Table - 3.

### Production

Madhya Pradesh was the sole producer of diamond. Apart from this, Coal, Bauxite, Copper Ore & Concentate, Iron Ore, Manganese Ore, Phosphorite and Limestone are the principal minerals produced in Madhya Pradesh State. The value of minor mineral's production is estimated as ₹ 3702 crores for the year 2020-21. There were 249 reporting mines in 2020-21 in case of MCDR of minerals (Table - 4).

### Mineral-based Industry

The present status of each Mineral-based Industry is not readily available. However, the important large and medium-scale mineral-based industries in the Organised Sector in the State are furnished in Table-5.

**Table – 1 : Reserves/Resources of Minerals as on 1.4.2020: Madhya Pradesh**

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	
			STD121	STD122			STD221	STD222					STD334	(B)
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Antimony														
Ore	tonne	-	7503	7503	-	-	592	-	-	-	-	592	8095	
Metal	tonne	-	75	75	-	-	5.92	-	-	-	-	5.92	80.92	
Bauxite <sup>#</sup>	'000 tonnes	13584	631	18564	20389	13358	7138	22060	54577	50172	-	167695	186259	
Copper														
Ore	'000 tonnes	107773	-	12580	55777	100411	8824	23062	300	77938	-	266312	386665	
Metal	'000 tonnes	1422.6	-	148.44	686.05	321.31	27.35	207.45	9.78	843.88	-	2095.82	3666.86	
Diamond	carat	847400	-	159	847559	-	-	104118	-	27645359	-	2749477	28597036	
Gold														
Ore	tonne	-	-	-	-	-	-	-	5745934	1947000	-	7692934	7692934	
Metal														
(Primary)	tonne	-	-	-	-	-	-	-	6.03	2.22	-	8.25	8.25	
Graphite	tonne	-	-	-	-	-	-	-	-	6254000	6386000	12640000	12640000	
Iron Ore														
(Haematite)	'000 tonnes	24363	11326	18440	30076	15080	29885	12613	3993	151523	59700	302870	356999	
Lead-Zinc														
Ore	'000 tonnes	-	-	-	129	117	-	1510	6396	7765	3150	19067	19067	
Lead Metal	'000 tonnes	-	-	-	-	-	-	26.12	5.13	5.04	-	36.29	36.29	
Zinc Metal	'000 tonnes	-	-	-	5.2	4.71	-	114.76	44.67	200.07	101.12	470.53	470.53	
Limestone	'000 tonnes	1252455	128972	3111004	772476	342790	1119260	498580	791417	4128019	308205	7960747	9653178	
Manganese														
Ore	'000 tonnes	13551	2230	3777	3830	7037	4212	127	23351	1943	-	40499	60057	

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Table – 1 (concl'd)

Mineral	Unit	Reserves				Remaining Resources						Total resources (A+B)		
		Proved STD 111	Probable STD121 STD122	Total (A)	Feasibility STD211	Pre-feasibility STD221	Measured STD331	Indicated STD332	Inferred STD333	Reconnaissance STD334	Total (B)			
Molybdenum														
Ore	tonne	-	-	-	-	-	-	-	8000000	-	-	8000000	-	8000000
Contained														
MoS <sub>2</sub>	tonne	-	-	-	-	-	-	-	5020	-	-	5020	-	5020
Potash	Million tonnes	-	-	-	-	-	-	1206	36	2	1244	-	1244	
Rock														
Phosphate	tonne	5258158	-	3772935	9031093	6460616	15688511	13880230	-	2730000	10615956	50625	49425938	58457031
Sillimanite	tonne	-	-	-	-	-	-	-	-	-	0	101600	101600	101600
Silver														
Ore	tonne	-	-	-	-	-	-	-	2096000	1120000	-	-	3216000	3216000
Metal	tonne	-	-	-	-	-	-	-	150.61	9.25	-	-	159.86	159.86
Vermiculite	tonne	-	-	-	-	-	-	66	-	66	-	-	329	329

Figures rounded off

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**Table – 2 : Reserves/Resources of Coal as on 1.4.2021 : Madhya Pradesh**

(In million tonnes)

Coalfield	Proved	Indicated	Inferred	Total
<b>Total</b>	<b>13479</b>	<b>13060</b>	<b>3678</b>	<b>30217</b>
Johilla	185	263	33	481
Umaria	178	4	-	181
Pench-Kanhan	1967	923	1166	4056
Pathakhera	291	88	68	447
Gurgunda	-	85	53	138
Mohpani	8	-	-	8
Sohagpur	2129	5659	293	8082
Singrauli	8722	6039	2064	16824

*Source: Coal Directory of India, 2021***Table –3 : Details of Exploration Activities in Madhya Pradesh, 2020-21**

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
<b>GSI</b> <b>Base Metals</b> Dewas	Burara- Khubgaon- Mawasa- Kundgaon areas	-	-	-	-	-	Reconnaissance Survey (G4) was carried out for Copper Mineralisation in Burara-Khubgaon-Mawasa-Kundgaon Area, Dewas District. The study area is a part of Harda- Barwah Inlier which lies in the northern fringe of ENE-WSW trending Narmada-Son lineament. The area comprises rocks of Harda Granitoids which includes gabbro, granite, porphyritic monzogranite, basalt, quartz veins and dolerite dyke. Occurrence of copper and associated mineralisation is observed within quartz vein in the form of malachite, chalcopyrite, pyrite and galena near Burara village and Nawalgaon village. The quartz vein occurs as bouldary exposures due to thick residual soil cover. BRS sample collected from bouldary outcrop of quartz vein in Burara area shows copper values upto 3045 ppm and sample collected from quartz vein in Nawalgaon area shows up to 440 ppm of copper.
Chhindwara	Kevlari- Mankughati	-	-	-	-	-	Reconnaissance survey (G4) for Base metal and associated mineralisation around Kevlari, Mankughati Village, (contd)

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Table – 3 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							Chhindwara district. The area exposes a sequence of Felsic volcanic suite of rocks in the eastern, central, western and south western part of mapped area which comprise of quartz-sericite-muscovite-schist, tuffaceous foliated rhyolite, tuffaceous phyllite interbanded with volcanic tuff, massive rhyolite, graphite/carbonaceous phyllite and calc silicate. Occurrences of Steel grey chunk of graphite in tuffaceous phyllite in scout borehole MPBKM-01.
Gwalior	Bhaggeh- Lakhnauti & Ainti	1:2000	1.6	14	1200	-	Preliminary exploration (G3) was carried out for Copper and associated mineralisation around Bhaggeh, Lakhnauti and Ainti. Detailed mapping of 1.6 sq km area on 1:2000 scale along with drilling of 1200m in 14 nos. borehole (1st level), was carried out in and around Lakhnauti, Ainti and Bhaggeh villages, with an objective to access the copper and its associated mineralisation. Regionally, the area comprises rocks of Archaean Bundelkhand granitoids, Lower Proterozoic Gwalior Group of rocks and Upper Proterozoic Kaimur Group belonging to Vindhyan Supergroup of rocks. However, the area around Lakhnauti, Bhaggeh, Ainti mainly comprises rocks of Bundelkhand granitoids represented by highly weathered granodiorite intruded by silicified quartz reefs. A total of five boreholes were drilled (for intersection of mineralisation at 60m vertical depth) with the strike spacing of 200m in Lakhnauti area and 300m in Ainti area covering the unexplored area in central and north-eastern part of the block. A total of 666.00m drilling meterage was achieved in all the above-mentioned borehole. Based on the complete analytical results of the core samples received for borehole no. MPBLK-01, a 5.5 m zone of mineralisation (Cu < 02%) was intersected at 54 m along the borehole having an average value of 2079.5 ppm Cu. Sulphide mineralisation which is manifested in the form of specks, stringers and disseminations of chalcopyrite and

(contd)

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Table – 3 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							Covellite was observed in all 05 boreholes. Stringers of chalcopyrite in quartz veins hosted by alkali feldspar syenite in core sample of borehole no. MPBLK-01 is shown in and disseminated chalcopyrite in quartz veins in core sample of borehole no. MPBLK-02.
Chhattarpur	Mahuajhala- Amrauniya area	1:12500	100	2	-	48	Reconnaissance survey (G4) was carried out for Base metal and associated mineralisation in Mahuajhala-Amrauniya area. Large scale mapping of 100 sq km on 1:12500 scale was mapped in Bundelkhand granitoid complex (BGC) and rocks of Bijawar Group. BGC was represented by various granitoids like syenogranite, porphyry syenogranite, medium grained quartz syenite, grey diorite, quartzofeldspathic vein, aplite vein, giant quartz vein/quartz reef and quartz veins within granitoids. Bijawar Group of rocks is represented by chert breccias, buff quartzite and ferruginous sandstone. Within the BGC, alteration zones were also mapped along with shear features controlling the quartz veins in granitoids. There are giant quartz veins (GQV) running along NE-SW and NNE-SSW whereas the other quartz veins which are found within granite are having varying dimensions and orientation along NE-SW, N-S, E-W and NW-SE and these veins are showing traces of sulphides with alterations in form of carbonatisation, phyllic alteration, propylitic, advanced argillic as well as ferruginization. Pyrophyllite is found associated with giant quartz vein with specs of pyrite- chalcopyrite. The altered part of granite is also having malachite stains. The chemical analysis of 15 bed rock samples for base metal analysis from Nagpur Laboratory, 30 bed rock samples from Bhopal Laboratory for base metal analysis and 03 PCS samples received so far is showing copper values ranging from 175 ppm to 1785 ppm.
<b>Gold</b> Singrauli	Sonkurwa & Byodhihar- Bagadha block	-	2.6	-	800	-	Preliminary exploration (G3) stage investigation was taken up in part of toposheet 63L/11 at Sonkurwa block to delineate the auriferous zone and

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Table – 3 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							assessment of gold mineralisation. The investigation comprising 800m drilling along with DM of 2.6 sq. km along with Core, BRS, PS, PCS and XRD sampling. Geologically, the area is occupied by Parsoi formation (volcano sedimentary sequence) of Mahakoshal Group which is represented by variegated phyllites, intrusive quartz veins and lensoidal bodies of metabasics parallel to phyllites. During DM it was observed the area indicates lateral change in sedimentary facies as well as along dip having fining upward sequence indicating turbidity type deposition setting with volcanics input in between in sink with back arc model of Mahakoshal belt. The Sulphide mineralisation occurs in Quartz Veins and metasediments, localised along the axial planes of minor folds which have been further cross cut by minor Qtz veins (cm scale). Analytical result reported so far shows wt average 1.16 ig/kg Au in borehole MPSSK-01 and 1.06 ig/kg in borehole MPSSK-04.
<b>Bauxite</b> Anuppur & Dindori	Tulra- Mediyaras- Benibari area	1:12500	100	-	-	60	Reconnaissance Survey (G4) was carried out for aluminous laterite and Bauxite in the area, large scale mapping (LSM) of 100 sq. km area on 1:12500 scale was carried out along with collection and chemical analysis of 50 nos. of bed rock samples (BRS), 10 nos. of petrochemical samples (PCS), 100 cubic meter pitting – trenching with collection of pit-trench samples (PTS) and study of 10 nos. polished section (PS). Geomorphologically, the area is mainly traversed by NE-SW trending moderate ridges. The large plateaus was observed in the area, therefore, the laterite/bauxite in the area is occurring as detached isolated bodies and doesn't have large aerial extension. It has varied thickness from 8- 10 m from the top of the ridge to 2-3m at the flank of the ridges. The complete analytical results of BRS, PCS, and PTS samples are awaited.
<b>Base Metals &amp; PGE</b> Betul	Dolia-Kappa -Gajpur areas	1:12500	100	-	-	295	Reconnaissance survey (G4) for PGE, Chromium (Cr) and Nickel (Ni) mineralisation in Padhar mafic-ultra-

(contd)



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Table – 3 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							mafic complex, was carried out. A 100 sq. km area was covered by LSM and 130 nos. bed rock samples, 30 nos. petrochemical samples, 30 nos. petrographic samples, 65 nos. pitting and trenching samples, 25 nos. SEM EDS samples and 15 nos. EPMA samples were collected. The study area falls in the western part of E-W trending Proterozoic Betul Belt and is a part of north-western fringes of Central Indian Tectonic Zone (CITZ) in Central India. The detailed field investigations through Large-scale mapping reveals that the rocks exposed in the study area are Precambrian granite gneiss (TTG), Olivine websterite, serpentinised pyroxenite, clinopyroxenite, gabbro (part of Padhar mafic ultra mafic complex), intrusive porphyritic and non-porphyrific alkali feldspar granite with enclaves of metasedimentary rocks. Further, these rocks are intruded by post magmatic phases of quartz and pegmatite veins of various dimensions. Gondwana sediments unconformably overlie the Precambrian granite gneiss and the Padhar mafic and ultramafic rocks. The whole area is further traversed by dolerite dykes trending NE-SW to E-W direction. For systematic geological, geochemical and mineral investigation, six mafic and ultramafic bodies have been demarcated within the study area based on their distinct litho assemblages and mode of occurrence, 1. Naharpur-Bargidhana mafic ultramafic body, 2. Gajpur-Ratamati mafic ultra-mafic body, 3. Gaulibargi-Pisajhori mafic ultra-mafic body, 4. Jharkund-Banjantanda mafic ultramafic body, 5. Mendhapani- Bajarwara mafic ultra-mafic body, 6. Umarwani-Mardwani mafic ultra-mafic body.
<b>Lithium</b> Betul	Kesmar-Mendakheda, 1:12500 Kanjitalav, Kota, Kajli	100		-	-	305	Reconnaissance Survey (G4) was carried out on an area of 100 sq. km mapped in 1:12500 scale in and around the area, with an objective to establish zones of scandium and other REE mineralisation. Field work involved collection of 100 nos. BRS, 50 nos. PTS, 15 nos. PCS along with 25 nos. PS, 25 nos. Soil/Regolith, 50 nos.

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Table – 3 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							Stream sediments, 10 nos. XRD, 15nos. SEM-EDX and 15 nos. EPMA samples. So far REE, Sc, Li analysis results of 30 nos. BRS are received. Total REE value in quartz syenite and syenite is ranging from 900 ppm to 2250 ppm in 9 nos. of samples. Soil samples are collected from these lithounits. Presence of aegirine, monazite, zircon was observed in these alkaline rocks i.e syenite, quartz syenite. At the north of Kanjitalav village galena was observed in quartz vein which was intruded in garnet bearing quartz mica schist. So far analysis result of one sample is received from this quartz vein and 1.15 % value of Pb is observed.
<b>Glauconite</b>							
(*G4 survey carried out with Chitrakoot district of Uttar Pradesh )							
Satna	Pindra-Bambiha	1:12500	55	-	-	-	Reconnaissance survey (GH) was carried out for glauconite in this area. An area of 55 sq. km was mapped on 1:12500 scale. The glauconitic sandstone is medium grained, bluish-green to reddish-brown colour, bedded and cross-bedded sandstone. The thickness of individual beds varies from 2cm to 30cm. Thin intercalations of shale/ chert is observed with thickness varying from 0.4cm to 2.5cm. The rock sequence indicates ENE-WSW strike and an average southerly dip of 7°. The glauconitic sandstone consists of quartz, glauconite, muscovite with minor presence of microcline, plagioclase and opaques. The subangular to subrounded quartz is a major mineral in sandstone generally enclosed in a matrix of iron-rich glauconite. The glauconite occurs as pellets as well as matrix. The majority of glauconite grains are under the process of formation of pellets i.e., not fully matured. K <sub>2</sub> O values in ten bedrock samples of glauconitic sandstone varies from 4.19% to 5.75%. K <sub>2</sub> O in thirteen bulk channel samples from glauconitic sandstone varies from 4.95% to 6.26%. One pit sample from an iron- rich glauconitic sandstone layer yielded 3.8% K <sub>2</sub> O. The

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Table – 3 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							weighted average K <sub>2</sub> O of five trenches varies from 2.31% to 5.64%.
<b>Graphite</b>							
Sidhi	Kunri-Baharia area	-	-	-	-	-	Reconnaissance Survey (G4) was carried out on Large scale geological mapping in the area. The study reports the occurrence of the graphite within Palaeoproterozoic carbonaceous phyllite, Agori Formation, Mahakoshal Group. During large scale mapping, total 09 lensoidal bodies of graphite have been demarcated in the study area. The discontinuous graphite bands within carbonaceous phyllite are present intermittently along its strike ENE-WSW and about 15m width (average). Prominent malachite staining has also been noticed along carbonaceous phyllite. Carbonaceous phyllite in the study area is dark grey to black in colour, fine grained, soft, and low specific gravity. The carbonaceous phyllite shows phyllitic cleavage and soils the hand. Systematic channel sampling has been carried out at 25 m channel interval along the strike length of graphite bearing carbonaceous phyllite with 5m sampling length for each sample across the strike length. Rock chips were collected from 5m channel length for each sample. Fixed carbon content of BRS sample ranging from <1% to 5.85% (average 2.82%). Extensive brecciation silicification, prominent malachite staining and goethite have been noticed in some area. Near to Goriara village (N24°21'27.6", E81°54'27.8"), gossan present within carbonaceous phyllite is highly ferruginised and limonitized and shows boxworks, abundant goethite and malachite staining showing presence of oxidation zone and gives encouraging Cu values upto 1.4%.
<b>Phosphorite</b>							
Jhabua	Jher-Jhabua	1:12500	100	-	-	260	Reconnaissance Survey (G4) for Phosphorite and associated mineralisation around Jher-Jhabua Area, Jhabua District. Rocks exposed in Jhabua-Alirajpur area represents

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Table – 3 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							the southern and south eastern extension of Aravalli fold belt, in Madhya Pradesh and represented by Lunawada Group. The lithologies exposed are variegated phyllite, quartzite, dolomite, chert and quartz veins. The Lunawada Group is unconformably overlain by Deccan traps, while it is underlain by Udaipur group of rocks represented by granite gneisse, amphibolite and hybridized granitised amphibolite and intruded by Godhra Granite. Intrusive granite and amphibolite are also observed. They are intruded by mafic and ultramafic suite of rocks known as Jobat Mafic/Ultramafic Complex. Godhra Granite further intrudes the Aravalli's. Bagh Group of rocks, which are in turn overlain by Deccan trap basalt, unconformably overlies these older sequences. During field work, 100 nos. BRS, 70 nos. Soil, 50 nos. PTS, 15 nos. PCS, 20 nos. PS and 5 nos. OM samples were collected. The analysed values of 10 bed rock and 10 soil samples received yield $P_2O_5$ from 0.06% to 0.16%.
Chhatarpur	Bineda-Darguwan- Pipariya Kalan area	1:12500	100	-	-	260	Reconnaissance survey (G4) was carried out for extent of Phosphorite bearing horizon in the area in Bijawar Group of rocks. Total 100 sq km area covered by large scale mapping on 1:12,500. Some lensoids phosphorite bodies marked in study area on the basis of visual estimation with the help of Shapiro test kit. $P_2O_5$ ranges from 2 to 8% (VE). Phosphorite Mineralisation is seen in area in form of matrix filling and veins type observed in brecciated chert in dolomite and ferruginous sandstone. During the course of mapping, 100 Bed Rock Sample (BRS) and 50 pitting/ trenching samples (PTS) were collected from all mineralised lithounits and analysed for $P_2O_5$ , $SiO_2$ , $Al_2O_3$ , $Fe_2O_3$ , $CaO$ , $MgO$ , $Na_2O$ , $K_2O$ , $TiO_2$ and $MnO$ . Analytical results of 50 Nos. BRS and 10 Nos. PTS samples has been received, but it not showing encouraging values. Results of rest of the samples are awaited.

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Table – 3 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
<b>Baryte</b>							
Dewas	Pipalkota, Garari Ajnas & adjoining areas	1:12500	-	-	-	215	Reconnaissance survey (G4) was carried out for Baryte and base metal mineralisation. The rocks exposed in the study area mainly comprise of quartzofeldspathic gneiss of Archaean's, meta volcano- sedimentary sequence of the Mahakoshal Group, Harda Granitoids, Gondwana sandstone and the Deccan traps. These are intruded by numerous basic and felsic dykes and quartz veins. Small outcrops of Gondwana sandstone has been recorded as capping over Harda granitoids. The Deccan flows overlie all these sequences. During large scale geological mapping on 1:12500 scale, baryte hosted quartz reefs are demarcated in the west of Kaulasa village, south east of Piplani and near to Garari village. In the west of Kaulasa, baryte hosted quartz reef is nearly 150m in length and 30m in width and trends in E-W direction where as in the southeast of Piplani, baryte hosted quartz reef is nearly 200m in length and 30m in width and trends in NE- SW direction. These two quartz reefs are exposed as small mounds in agricultural land with some scree of barite hosted quartz boulders. Baryte mineralisation is found to the east of Garari village in a quartz vein. Besides LSM, 100 nos. of BRS sample, 50 nos. of soil sample, 50 nos. of PTS and 15 nos. of petrochemical samples are collected and submitted for chemical analysis. The assay value of BRS samples ranges from 27.35% to 47.96% Ba and assay value of PTS samples varies from 20.13% to 55.29% Ba.

## STATE REVIEWS

**Table – 4 : Mineral Production in Madhya Pradesh, 2018-19 to 2020-21  
(Excluding Atomic Minerals)**

(Value in ` '000)

Mineral	Unit	2018-19			2019-2020			2020-21 (p)		
		No. of mines	Quantity	Value	No. of mines	Quantity	Value	No. of mines	Quantity	Value
<b>All Minerals</b>		<b>223</b>		<b>82555134</b>	<b>223</b>		<b>147021686</b>	<b>249</b>		<b>62890259</b>
Coal	'000t	-	118661	-	-	125726	-	-	132531	-
Natural										
Gas (ut.) +	m c m	-	357	-	-	345	-	-	334	-
Bauxite	t	20	750433	599967	20	685929	546953	21	621505	472602
Copper Ore	t	-	2542159	-	-	2544472	-	-	2344087	-
Copper Conc.	t	1	70999	4000290	1	65094	4750125	1	64920	5238309
Iron Ore	'000t	18	2802	1448203	19	3343	1729068	21	4094	2165967
Manganese										
Ore	t	41	942738	7147719	42	962576	6220812	43	921147	5859476
Phosphorite	t	5	98600	88543	5	99960	94304	5	97880	92007
Diamond	crt	2	38437	539062	2	28816	352472	2	13917	220304
Limestone	'000t	136	50102	12271100	134	47118	12332360	156	45978	11824339
Minor										
Minerals		-	-	56460250	-	-	120995592	-	-	37017255

*Note : The number of mines excludes Fuel and Minor minerals.**\$ Excludes the value Fuel minerals.**+ Coal Bed Methane***Table – 5 : Principal Mineral-based Industries**

Industry/plant	Capacity (`000 tpy)
<b>Aluminium/Alumina</b>	
Hindalco Industries Ltd, Mahan Aluminium, Bargwan, Distt Singrauli	360 (Aluminium)
<b>Asbestos Products</b>	
Everest Building Products Ltd, Kymore	NA
Kalani Industries Pvt. Ltd, Pitampur, Dhar	NA
Ramco Industries Ltd, Maksi, Distt Shajapur	NA
<b>Calcined Lime</b>	
Rekha Harlalka, Jukehi, Maihar	11
Padampani Tripathi, Mamalime Industries Rajarwara, Katni	9.6
<b>Cement</b>	
ACC Ltd, Kymore, Distt Katni	2720
Bhilai Jaypee Cement Ltd, Babupur, Satna	1300

(Contd)

Table-5 (contd)

Industry/plant	Capacity (`000 tpy)
Birla Corpn. Ltd, (Satna Cement Works & Birla Vikas Cement), Satna	2200
Birla Cooperation Ltd, (Erstwhile Reliance Cement Pvt. Ltd, Maihar, Distt Satna	3000
Century Textiles & Ind. Ltd, Maihar Cement, Maihar (unit I&II), Distt Satna	4200
Heidelberg Cement (I) Ltd, Narsingarh, Distt Damoh	2000
Jaiprakash Power Ventures, Singrauli (G)	2000
Jaypee Rewa Cement Plant, Distt Rewa	2500
Jaypee Bela Cement Plant, Distt Rewa	2600
KJS Cement, Rajnagar, Distt Satna	2200
Prism Cement Ltd, (Unit I & II), Satna	6600
Satguru Cement Pvt. Ltd, Ghursal, Gandhawani	95
UltraTech Cement Ltd, Sidhee	2300

(Contd)

## STATE REVIEWS

Table-5 (contd)

Industry/plant	Capacity ('000 tpy)
UltraTech Cement, Dhar Cement Plant, Tonki, Temarni sounul, Golpura Manawar	3500
UltraTech Cement, Vikram Cement Plant, Khor, Distt Neemuch	4500 (OPC) 4500 (PPC)
UltraTech Cement Ltd, Majhigawan, Rampur Naikin	3000
<b>Ceramic</b>	
Roca Bathroom Products Ltd, Dewas	NA
Govind Tiles Pvt. Ltd, Garra, Distt Balaghat	NA
<b>Calcined lime</b>	
Som lime work, Jukehi, Katni	21.6
Jai Mata lime Industries Pathra, Katni	15.2
Dharampal Industries Pathra, Katni	6
Sampuran Singh Saluja Patra, Katni	6.07
<b>Fertilizer</b>	
Agro Phos. (India) Ltd, Dewas	45 (SSP)
Arihant Ferts. & Chems. India Ltd, Kanawati, Neemuch	66 (SSP)
Basant Agro Tech (India) Ltd, Jawad, Neemuch	45 (SSP)
Coromandel International Ltd, (Formerly, Liberty Urvarak Ltd.), Nirmani Khargone	100 (SSP)
Indra Industries Ltd, (Formerly, Swastik Ferts & Chems Ltd.), Indore, Dhar	66 (SSP)
KMN Chemicals & Fertilizers Ltd, Diwanganj, Raisen	60 (SSP)
Khaitan Chemical & Fertilizers Ltd, Nimrani, Distt Khargone	400 (SSP) 115.5 (H <sub>2</sub> SO <sub>4</sub> )
NFL, Vijaipur (Unit I & II), Distt Guna	2066.1 (Urea)
Krishna Phoschem Ltd, Meghnagar, Jhabua	120 (SSP)
Madhya Bharat Agro Products Ltd, Rajoa, Sagar	60 (SSP)

(Contd)

Table-5 (concl'd)

Industry/plant	Capacity ('000 tpy)
Madhya Bharat Phosphate Pvt. Ltd, (Unit I), Diwanganj, Sanchi, Raisen	132 (SSP)
Madhya Bharat Phosphate Pvt. Ltd, (Unit II), Meghnagar, Jhabua	165 (SSP)
Mexican Agro Chemical Ltd, (Formerly, Asha Phosphates Ltd.), Jaggakhedi, Mandsaur	60 (SSP)
Mukteswar Fertilizers Ltd, Narayankhedi, Ujjain.	60 (SSP)
Rama Phosphates Ltd, Indore	250 (SSP) 102 (H <sub>2</sub> SO <sub>4</sub> )
Suman Phosphates and Chemicals Ltd, Indore	330 (SSP)
Varun Fertilizers Pvt. Ltd, Dewas	100 (SSP)
<b>Ferroalloys</b>	
Crescent Alloys Pvt. Ltd, Seoni	4.5
Jalan Ispat Castings Ltd, Meghnagar, Distt Jhabua	12
MOIL Ferro Manganese Plant, Bharveli, Distt Balaghat	10
<b>Petroleum Refinery</b>	
Bharat Oman Refineries Ltd, Bina, Distt Sagar	6000
<b>Refractory</b>	
ACC Refractories, Katni	65
Calderys India Refractories Limited	78
Katni Refractory Works, Katni Murwara	30 (Binder) 9 (Grout)
Mahakoshal Refractories Pvt. Ltd, Katni	61.09
Mahakoshal Refractories Pvt. Ltd, Gudri, Bohariband	31
Premier Refractories India Pvt. Ltd, Katni.	50

G; Grinding Unit

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