

STATE REVIEWS



Indian Minerals Yearbook 2015

(Part- I)

54th Edition

STATE REVIEWS
(Bihar)

(FINAL RELEASE)

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MINISTRY OF MINES
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BIHAR

Mineral Resources

Bihar is the principal holder of country's pyrite resources and possesses 94% of resources. The important mineral occurrences in Bihar are **coal** in Rajmahal coalfield; **limestone** in Kaimur (Bhabhua), Monghyr and Rohtas districts; **mica** in Nawada district; **quartz/silica sand** in Bhagalpur, Jamui, Monghyr and Nalanda districts; **quartzite** in Lakhisarai, Monghyr and Nalanda districts; **talc/soapstone/steatite** in Monghyr district. Besides, occurrences of **bauxite** in Monghyr and Rohtas districts; **china clay** in Bhagalpur and Monghyr districts; **felspar** in Gaya, Jamui and Monghyr districts; **fireclay** in Bhagalpur and Purnea districts; **gold** in Jamui district; **granite** in Bhagalpur, Gaya, Jahanabad and Jamui districts; **iron ore (haematite)** in Bhagalpur district; **iron ore (magnetite)** in Gaya and Jamui districts; **lead-zinc** in Banka and Rohtas districts and **pyrites** in Rohtas district are reported (Tables - 1 and 2).

Exploration & Development

GSI carried out exploration for coal in

Bhagalpur, gold in Gaya and REE in Jamui and Banka districts. Details of exploration activities conducted by GSI during 2014-15 are furnished in Table-3.

Production

The value of mineral production (excludes atomic mineral and value for February and March in respect of 31 minerals declared as minor mineral vide Gazette notification dated 10.02.2015) in Bihar at ₹ 414 crore in 2014-15 decreased by 2% as compared to the previous year. Minor minerals dominate the value of mineral production contributing 96% of the total value of mineral production in the State followed by limestone with 4 percent. The State reported 8,629 tonnes of sulphur production registering a decrease of 16% in the year under review over the previous year. The output of limestone decreased by 14% during 2014-15 (Table-4).

The value of production of minor minerals was estimated at ₹ 398 crore for the year 2014-15.

The number of reporting mines in Bihar in 2014-15 was three as against five in the previous year.

Table – 1 : Reserves/Resources of Coal as on 1.4.2015 : Bihar

(In million tonnes)

Coalfield	Proved	Indicated	Inferred	Total
Total/Rajmahal	-	-	160.0	160.0

Source: Coal Directory of India, 2014-15.

Table – 2 : Reserves/Resources of Mineral# as on 1.4.2010/1.4.2013* : Bihar

Mineral	Unit	Reserves				Remaining Resources						Total Resources (A+B)	
		Proved STD111	Probable		Total (A)	Feasibility STD211	Pre-feasibility STD221	Measured STD331	Indicated STD332	Inferred STD333	Reconnaissance STD334		Total (B)
			STD121	STD122									
Bauxite*	'000 tonnes	-	-	-	-	-	-	-	-	4114	-	4114	4114
China clay#	'000 tonnes	-	-	-	-	-	104	39	1296	1438	-	1438	1438
Felspar#	tonne	-	35147	35147	-	-	-	4195	4871499	-	-	4875694	4910841
Fireclay#	'000 tonnes	-	-	-	-	-	-	-	44	-	-	44	44
Gold*	-	-	-	-	-	-	-	-	-	-	-	-	-
Ore (primary) Metal	tonne	-	-	-	-	-	-	-	128884860	94000000	222884860	222884860	222884860
(primary) Metal	tonne	-	-	-	-	-	-	-	21.6	16	37.6	37.6	37.6
Granite (Dim. stone)	'000 cu m	-	-	-	-	-	-	179000	698612	-	-	877612	877612
Iron ore* (Haematite)	'000 tonnes	-	-	-	-	-	-	-	55	-	-	55	55
Iron ore* (Magnetite)	'000 tonnes	-	-	-	-	-	-	-	2659	-	-	2659	2659
Lead-zinc* Ore	'000 tonnes	-	-	-	-	-	-	435	11000	-	-	11435	11435
Lead metal	'000 tonnes	-	-	-	-	-	-	-	24	-	-	24	24
Zinc metal	'000 tonnes	-	-	-	-	-	-	14.75	24	-	-	38.75	38.75
Limestone	'000 tonnes	7822	795	8617	-	6123	86379	38210	709522	-	-	846923	855540
Mica#	kg	-	74233	74233	-	-	-	-	12992434	7700	13000134	13074367	13074367
Pyrite	'000 tonnes	-	-	-	13462	-	-	9680	1500000	-	-	1574561	1574561
Quartzite#	'000 tonnes	-	32	32	146	461	5287	22822	227531	-	-	276302	276334
Quartz-silica sand#	'000 tonnes	-	-	2121	-	-	-	-	24652	-	-	24652	26773
Talc/steatite/soapstone#	'000 tonnes	-	-	149	-	-	-	-	3	-	-	3	152

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Figures rounded off.
 * Reserves/Resources as on 1.4.2013.
 # Declared as minor mineral vide Gazette notification dated 10.02.2015.

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Table – 3 : Details of Exploration Activities in Bihar, 2014-15

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
GSI							
Coal							
Bhagalpur (Rajmahal Coalfield)	Mirjagaon area,	-	-	7	2467.75	-	The G4 stage of exploration programme has been initiated in November, 2013 and is continued in FS 2014-15. In Mirjagaon area, a cumulative total of 3330.10 m was drilled in 7 boreholes (RBMG-1 to RBMG-7) out of which 2467.75 m drilling has been carried out during FS 2014-15. Cumulative coal seam thickness as intercepted at each borehole is 41.32 m in RBMG-1, 55.00 m in RBMG-2, 30.00 m in RBMG-3, 32.00 m in RBMG-4, 35.10 m in RBMG-5, 21.75 m in RBMG-6 and 11.15 m in RBMG-7. Based on band by band proximate analysis of coal intersected at each borehole, four coal seam zones have been identified. Coal seam zone-A thickness varies from 10.60 m (432.80 to 443.40 m) in RBMG-1 to 103.15 m (495.85 to 599.00 m) in RBMG-4. Zone B thickness varies from 57.00 m (400.35 to 457.35 m) in RBMG-2 to 122.75 m (261.25 to 384.00 m) in RBMG-1. Zone C thickness varies from 27.80 m (220.00 to 247.80 m) in RBMG-1 to 41.60 m (360.90 to 402.50) in RBMG-3. Zone D thickness varies from 58.95 m (109.75 to 168.70) in RBMG-1 to 102.36 m (241.89 to 344.25) in RBMG-3. The Intertrappean beds with Ptilophyllum sp in RBMG-4 above Barakar Formation indicates Cretaceous Age for the Intertrappean bed. Coal petrographic study reveals that rank-wise the coal can be categorised under Lignito-Bituminous to Sub-Bituminous type. From the data, accrued so far, a tentative geological resource of coal of about one thousand million tonnes is expected from the Mirjagaon area.
Gold							
Gaya	Majhauri-Ghansura- Ajaynagar area	-	-	7	-	-	G4 stage investigation was carried out to identify zones of gold mineralisation. Surface work was carried out in Majhauri (Block-B) while Ghansura (Block-C) and West Ajaynagar (Block-D) were explored by scout drilling. Three boreholes, NB-07, NB-08 & NB-09, were targeted in Majhauri Block (Block-B). The main lithology intersected along these boreholes includes tuff with associated very thin BIF bands (<30 cm), phyllite and gabbro sill. From the analytical results so far received, a total of 14 samples yielded low range anomalous Au value ranging from 50 ppb to 295 ppb. Three zones of one metre thickness each, were identified in Borehole NB-09 at 69.35

(Contd.)

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Table – 3 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							to 70.35 m (Average Au=210 ppb), 70.95 to 72.3 m (Average Au=65 ppb) and 73.7 to 74.5 m (Average Au=75 ppb) along borehole. Four boreholes, NB-10 to NB-13, were drilled in Ghansura Block (Block-C). Various lithounits intersected along these boreholes include basalt, rhyolite, mixed (hybrid) rock and banded carbonate chert. Sulphide minerals mainly pyrrhotite, pyrite, chalcopyrite and bornite were found associated with rhyolite, basalt, mixed rocks and associated quartz veins. Block-D exposed tuffaceous phyllite, rhyolite, basalt, gabbro sill, andesite, carbonate, mixed volcanic rock showing features of mixing and mingling of felsic and mafic magmas. These rocks have also been intruded by carbonate and quartz veins. The smoky quartz veins have minor sulphides including pyrite, chalcopyrite, bornite and pyrrhotite. The mixed rock at some places shows presence of arsenopyrite, bornite and chalcopyrite. Sulphide zones have been identified within rhyolite, mixed rock and quartz veins. Geophysical survey (IP-SP) of 61.121 km carried out in the Block D helped in delineating two prominent anomaly zones, (Zone-I and Zone-II) characterised by high chargeability and low SP. The depth to the top of the causative body estimated from the IP/resistivity pseudo depth section is at about 15 m to 20 m from the surface. Nine samples from Block-D yielded anomalous Au value ranging from 60 ppb to 950 ppb (Avg. 277 ppb; n=9). The investigation has been completed.
REE							
Jamui and Banka	Chandan area	-	-	2	798.25	59	G4 stage of investigation of REE was taken up in Bihar Mica Belt around Chandan area. During the course of mapping several bands and lenses of aplitic granite and pegmatite have been mapped. The most significant aplitic granite band has been located near village Salonia having length of about one kilometer and width varying between 1 m and 10 m. This unit has analysed 86.86 to 500.10 ppm tREE while the pegmatites have analysed 17.28 to 516.11 ppm of tREE. On the basis of chemical analyses of 59 samples in respect of REE, source rocks of REE minerals have been identified to be pegmatite, aplitic granite and quartzofeldspathic veins intruding amphibolites and granite gneisses. In situ (Contd.)

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Table – 3 (Concl.d.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							soil and laterite have also shown higher tREE concentration. tREE concentration in different units have been recorded as following: Pegmatite - 17.28 to 516.11 ppm, Aplitic granite - 86.86 to 500.10 ppm, Quartzo-feldspathic veins intruding the amphibolites and granite gneisses - 135.28 to 413.72 ppm, Laterite - 372.85 ppm, Soil samples - 210.44 to 376.90 ppm, Stream Sediment Sample - 143.31 to 510.28 ppm, Weathered Aplitic granite - 323.71 ppm and Weathered amphibolite - 412.54 ppm. Out of 59 nos. of samples analysed, 40 nos. of samples have indicated tREE value above the Upper Continental Crust value of 146.37 ppm. Chemical analyses in respect of Unit Cell Stream sediment samples (60 nos.) have also been received which have analysed significant REE values ranging from 146.37 to 9884.36 ppm. The investigation will continue in FS 2015-16.

**Table – 4 : Mineral Production in Bihar, 2012-13 to 2014-15
(Excluding Atomic Minerals)**

(Value in ₹ '000)

Mineral	Unit	2012-13			2013-14			2014-15 (P)		
		No. of mines	Quantity	Value	No. of mines	Quantity	Value	No. of mines	Quantity	Value
All Minerals		6		1997065	5		4240107	3		4140602
Limestone	'000t	2	588	223401	2	549	247877	1	473	162106
Mica [#] (crude)	t	1	-	-	1	-	-	1	-	-
Mica [#] (waste & scrap)*	t	-	2939	-	-	3381	-	-	1378	-
Quartz [#]	t	1	8997	3914	1	-	-	1	-	-
Quartzite [#]	t	2	109495	54829	1	35346	16350	-	5706	2616
Sulphur ^{\$}	t	-	12345	-	-	10253	-	-	8629	-
Minor Minerals [@]		-	-	1714921	-	-	3975880	-	-	3975880

Note : The number of mines excludes minor minerals.

** Includes mine waste obtained while dressing of crude mica.*

\$ Recovered as by-product from oil refinery.

@ Figures for earlier years have been repeated as estimates, wherever necessary, because of non-receipt of data.

Declared as minor mineral vide Gazette notification dated 10.02.2015.

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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 with their total installed capacities are furnished in Table - 5.

Table – 5 : Principal Mineral-based Industries in Bihar

Industry/plant	Capacity ('000 tpy)
Cement	
Kalyanpur Cements Ltd, Banjari, Distt. Rohtas.	1000
Shree Cement Ltd, Aurangabad Grinding Unit, Aurangabad.	2000
Fertilizer	
Harabhara Fertilizer, Dhanukagra.	NA
Shrikrishna Fertilizers Ltd, Muzaffarpur.	30 (SSP)
Petroleum Refinery	
Indian Oil Corporation, Barauni.	6000

Note: Data, for fertilizer industries, is taken from Indian Fertilizer Scenario, 2015/FAI Statistics, 2014-15.