

STATE REVIEWS



Indian Minerals Yearbook 2015 (Part- I)

54th Edition

**STATE REVIEWS
(West Bengal)**

(ADVANCE RELEASE)

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

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WEST BENGAL

Mineral Resources

West Bengal is the principal holder of country's apatite resources. It is said to possess 54% apatite and 16% china clay resources of the country. Important minerals that occur in the State are: **apatite** in Purulia district; **coal** in Bardhaman, Bankura, Birbhum, Darjeeling, Jalpaiguri and Purulia districts; **china clay** in 24-Parganas, Bankura, Birbhum, Bardhaman, Hoogly, Midnapur and Purulia districts; and **fireclay** in Bankura, Birbhum, Bardhaman and Purulia districts.

Other minerals that occur in the State are **barytes, copper, gold, kyanite, pyrite** and **titanium minerals** in Purulia district; **dolomite** in Jalpaiguri district; **felspar** in Bankura and

Purulia districts; **granite** in Bankura, Birbhum and Purulia districts; **lead-zinc** in Darjeeling district; **limestone** in Bankura and Purulia districts; **manganese ore** and **sillimanite** in Midnapur district; **quartz/silica sand** in Bankura, Hoogly and Purulia districts; and **tungsten & vermiculite** in Bankura district (Table - 1). Reserves/resources of coal and lignite along with details of coalfields/disticts are provided in Table-2 & Table-3.

Exploration & Development

During 2014-15, National Oil Companies (NOC) carried out seismic surveys and exploration for oil and gas in the state. The details of exploration activities conducted by GSI and other agencies for coal and other minerals during 2014-15 are furnished in Table-4.

Table – 2 : Reserves/Resources of Coal as on 1.4.2015 : West Bengal

(In million tonnes)				
Coalfield	Proved	Indicated	Inferred	Total
Total	13518.15	13009.69	4906.79	31434.63
Raniganj	13317.36	7288.25	4027.22	24632.83
Barjora	200.79	-	-	200.79
Birbhum	-	5721.44	864.57	6586.01
Darjeeling	-	-	15.00	15.00

Source: Coal Directory of India, 2014-15.

Table –3 : Reserves/Resources of Lignite as on 1.4.2015 : West Bengal

(In million tonnes)				
District	Proved	Indicated	Inferred	Total
Total	-	1.13	1.64	2.77
Rakshitpur	-	0.29	0.86	1.15
Mahalla	-	0.64	-	0.64
Dhobbanpur	-	0.20	0.78	0.98

Source: Coal Directory of India, 2014-15.

Table – 1 : Reserves/Resources of Minerals as on 1.4.2010/1.4.2013* : West Bengal

Mineral	Unit	Reserves					Remaining resources					Total resources (A+B)	
		Proved STD 111	Probable		Feasibility STD211	Pre-feasibility		Measured STD331	Indicated STD332	Inferred STD333	Reconnaissance		
			STD121	STD122		STD221	STD222				STD334		(B)
Apatite*	tonne	-	-	-	-	491818	1225345	120000	8845250	852605	666646	12201664	12201664
Barytes#	tonne	-	-	-	-	-	-	-	433000	-	-	433000	433000
China clay#	'000 tonnes	1232	185	906	2323	202	703	38	332236	80335	5826	419340	421663
Copper*	'000 tonnes	-	-	-	-	-	-	-	113	-	-	113	113
Ore	'000 tonnes	-	-	-	-	-	-	-	2.09	-	-	2.09	2.09
Metal	'000 tonnes	-	-	-	-	-	-	-	-	-	-	-	-
Dolomite**	'000 tonnes	-	-	-	-	12528	48000	-	73226	104275	-	238029	238029
Felspar#	tonne	25874	-	-	25874	-	-	900000	3400000	201250	-	4501250	4527124
Fireclay#	'000 tonnes	771	104	854	1729	476	883	-	419	11115	958	13851	15580
Gold*	'000 tonnes	-	-	-	-	-	-	-	-	-	-	-	-
Ore (primary)	tonne	-	-	-	-	-	-	-	-	-	-	12833333	12833333
Metal (primary)	tonne	-	-	-	-	-	-	-	-	-	0.65	0.65	0.65
Granite (Dim. stone)	'000 cu m	3658	-	-	3658	-	-	19827	1140	8802	-	29769	33427
Kyanite	tonne	-	-	-	-	-	-	-	-	26520	-	26520	26520
Lead-zinc*	'000 tonnes	-	-	-	-	-	-	-	3371	335	-	3706	3706
Ore	'000 tonnes	-	-	-	-	-	-	-	130.07	10	-	140.07	140.07
Lead metal	'000 tonnes	-	-	-	-	-	-	-	130.42	13	-	143.42	143.42
Zinc metal	'000 tonnes	-	-	-	-	-	-	7104	15482	22120	-	44706	44706
Limestone	'000 tonnes	-	-	-	-	-	-	-	-	-	-	-	-
Manganese ore*	'000 tonnes	-	-	-	-	-	-	-	-	200	-	200	200
Pyrite	'000 tonnes	-	-	-	-	-	-	-	-	2500	-	2500	2500
Quartz-silica sand#	'000 tonnes	779	-	1022	1801	11	11	-	-	4607	-	4629	6430
Sillimanite	tonne	-	-	-	-	-	-	-	-	1653000	-	1653000	1653000
Titanium minerals**	tonne	-	-	-	-	-	-	-	-	2279000	-	2279000	2279000
Tungsten*	tonne	-	-	-	-	-	-	-	-	400000	-	400000	400000
Ore Contained	tonne	-	-	-	-	-	173063	-	190739	-	-	763802	763802
WO ₃	tonne	-	-	-	-	-	450	-	80.84	1000	-	1530.84	1530.84
Vermiculite	tonne	-	-	-	-	-	-	-	490	5076	-	5566	5566

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Figures rounded off.

*Reserves/Resources as on 1.4.2013

** Resources of ilmenite, rutile and zircon as per Department of Atomic Energy for the minerals are provided in the respective Mineral Reviews.

Declared as minor mineral vide Gazette Notification dated 10.02.2015.

Note: The proved and indicated balance recoverable reserves of coal bed methane (CBM) in the State as on 01.04.2015 is 39.33 billion cu m.

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Table – 4 : Details of Exploration Activities in West Bengal, 2014-15

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
GSI							
Coal							
Birbhum (Rajmahal Birbhum Coalfield)	Djara area	-	-	4	2424.25	11	A total of 2424.25 m has been drilled in four boreholes (three boreholes completed and one borehole in progress) with intersection of 2.48 m lignite (in two split sections) within the depth range of 95.39 m to 162.01 m. Barakar coal seam zones II (thickness-1.49 m), III (Cumulative coal thickness from 3.22 m-6.91 m) and IV (thickness-2.14 m) in ascending order were intersected between the depth range of 663.38 m to 787.86 m. During this period, 11 samples of CBM desorption study was carried out with maximum 0.99 cc/gm desorbed gas. The area is covered with Tertiary sediments. The maximum thickness of Tertiary sedimentaries is 323.40 m; Rajmahal Formation is 317.40 m, Barakar Formation is 233.41 m and Talchir Formation is 61.37 m, respectively. Geophysical logging of 797 m has been done in one borehole.
-do-	Gazipur west sector	-	-	3	1435.9	-	A total of 1435.90 m have been drilled in three boreholes in Gazipur West Sector. A 2.38 m lignite intersected at a depth of 251.11 m in Borehole BGZW-5. Barakar coal seam zones III and IV in ascending order and having a cumulative coal thickness range between 0.63 m to 1.30 and 1.96-1.97 m, respectively has been intersected between the depth ranges of 520.21 m to 710.88 m. Desorption study carried out in borehole No. BGZW-4 for two no. of samples and the desorbed gas (cc/gm) ranged between 0.011 cc/gm to 0.012 cc/gm. The borehole data reveals that the entire area is covered by Tertiary sediments. The maximum thickness of Tertiary sedimentaries is 275.60 m; Rajmahal Formation is 383.30 m and Barakar Formation is 183.19 m, respectively. Geophysical logging of 657 m was undertaken in one borehole. Exploration in this area was completed on 17.03.2015.
Raniganj Coalfield	Gaurangapur- Bankati area, Damodar-Koel Valley	1:25000	-	5	2560.7	-	The exploration for coal under G-3 stage was continued in Gaurangapur-Bankati area, concealed under younger tertiary sediments lies in the easternmost extremity of the known limits of Raniganj Coalfield. This block is outside the domain of CBM Block and in the east of previously explored Bistupur-Dandeswar area. A total of 2560.70 m

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Table – 4 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Nickel							was drilled in five boreholes (two complete and three running) viz. RGB-1 to 5 and 2126 m was geophysically logged. Raniganj coal seam zones namely R-IX, R-VIII and R-VII (in ascending order) were recorded in borehole RGB-3 within the depth range of 276.80 m and 435.50 m. The coal seam Three zone R-IX is a solitary seam with a thickness of 1.02 m. Coal seam zone R-VIII is the most promising seamzone, having cumulative coal thickness of 8.25 m with seven split sections and their thicknesses varying from 0.50 m to 3.20 m. Seam zone R-VII in this borehole is also having two split sections with thicknesses 0.67 m and 3.95 m, respectively. Two thin seams of around 0.50 m thickness were intersected in borehole RGB- 4 within the depth range of 281 m to 302 m. Another two coal seams of thicknesses 0.90 m and 0.63 m, respectively were recorded in Borehole RGB-5 within the depth range of 199.78 m to 227.85 m. One 1.85 m thick lignite band was also recorded in Borehole RGB-5 at a depth of 147. Gastropod and bivalve shells were recorded in Tertiary sediments and Plant and Vertibraria fossil impressions were recorded in Raniganj Formation in all the borehole cores. Coal petrographic study reveals, that rank wise the coal can be categorized under High Volatile Bituminous C type.
Purulia	Around Lalpur-Hura-Bishpuria area	-	-	-	-	-	The reconnaissance stage (G4) investigation for search of Ni, Cr and PGE mineralisation in mafic-ultramafic suite of rocks was taken up. The major lithounits are metabasic rock (amphibolite), mafic granulite, granite gneiss and hornblende gneiss of Chottanagpur Gneissic Complex (CGC). The pyroxenite-gabbro- anorthositic-gabbro suite of rocks occurs as intrusives into the CGC country in the mapped area. Sulphide dissemination in gabbroic rocks is noticed at places. The sulphide minerals were identified to be pyrite, chalcopyrite, pyrrhotite and pentlandite by petrography and SEM study. Inclusion of subhedral Co bearing pentlandite in pyrrhotite is noticed in the gabbro east of Hura. No PGE bearing mineral has been identified. The analytical results of powdered samples from pyroxenite-gabbro-anorthositic gabbro suite of rocks received so far, revealed the concentration of Ni ranges from 36 to 475 ppm, Cr 34 to 275 ppm, Pt <10 to 35 ppb and Pd from <5 to 17 ppb.

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Table – 4 (Concl.d.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
State Directorate of Mines & Minerals							
Apatite							
Purulia	N/v Kutin	-	-	03	158	-	Exploration was in progress.
Manganese ore							
Paschim Medinipur	Around Belpahari area	1:10000	100	-	-	50	DMM carried out exploration of manganese ore alongwith laterite by mapping on 1:10,000 scale in 100 sq km area; 50 nos. pitting and sampling/ analysis of 50 nos. samples.
Silica Sand and Clay							
Bankura	N/v Brindabanpur, and Chandar	1:12000	35	-	-	36	Three nos trenching and 10 nos. of pitting have been carried out.
-do-	N/v Dhunara, Ainagobindapur etc.	1:12500	37	-	-	38	Ten nos. of pitting have been carried out.

Production

The value of mineral production (excludes atomic minerals and value for the month of February and March in respect of 31 minerals declared as minor mineral vide Gazette Notification dated 10.02.2015) in West Bengal at ₹ 8,350 crore in 2014-15 increased by 91%, mainly due to increase in the unit value of coal as compared to the previous year. The State accounted for about 3% of the value of mineral production in the country. Coal accounted for 96% of the value of mineral production in the State, while natural gas (utilised) contributed 2% of the value during the review period. The other important minerals produced in the state were fireclay, kaoln, quartz, silica sand, etc.

Among the important minerals, output of silica sand in the State increased by 44%, natural

gas (utilised) 37%, sulphur 19%, coal 6% and quartz 5% as compared to the previous year. However, the output of quartzite decreased by 64%, fireclay 37%, kaolin 11% and felspar 4 percent (Table-5).

The value of production of minor minerals was estimated at ₹ 146 crore for the year 2014-15.

The number of reporting mines in West Bengal in 2014-15 was 118 as against 121 in the previous year.

Mineral-based Industry

The present status of each mineral-based industry is not readily available. However, Important mineral-based industries located in the State with their total installed capacities are given in Table - 6.

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**Table – 5 : Mineral Production in West Bengal, 2012-13 to 2014-15
(Excluding Atomic Minerals)**

(Value in ₹ '000)

Mineral	Unit	2012-13			2013-14			2014-15 (P)		
		No. of mines	Qty	Value	No. of mines	Qty	Value	No. of mines	Qty	Value
All Minerals		127		110869851	121		43759612	118		83498534
Coal	'000t	101	26500	108398700	100	28200	40794000	99	30000	80025800
Natural Gas (ut.)	m c m	-	107	884904	-	166	1372841	-	228	1885589
Apatite	t	1	-	-	1	-	-	1	-	-
Felspar*#	t	-	13560	5148	-	19842	7596	-	19137	7840
Fireclay#	t	6	99088	16489	6	96102	19224	5	60119	11607
Kaolin#	t	13	98061	69047	8	90582	69187	8	80999	58233
Quartz#	t	3	30262	9370	3	35520	12569	3	37215	13345
Quartzite#	t	1	300	90	1	7090	2162	1	2560	917
Silica Sand#	t	1	71752	30908	1	62415	26786	1	89925	40090
Moulding Sand	t	1	305	82	1	490	134	-	-	-
Sulphur ^s	t	-	36382	-	-	41901	-	-	49659	-
Minor Minerals@		-	-	1455113	-	-	1455113	-	-	1455113

*Note: The number of mines excludes minor minerals.***Associated with Kaolin, Quartz and Silica Sand.**\$ 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.***Table – 6 : Principal Mineral-based Industries in West Bengal**

Industry/plant	Capacity ('000 tpy)
Asbestos Products	
Everest Building Products Ltd, Kolkata.	NA
Ramco Industries Ltd, Haratara, Distt. Paschim Medinipur.	NA
UAL Industries Ltd, Tungadhawa, Distt. Paschim Medinipur.	150
Abrasives	
Carborandum Universal Ltd, Gopalpur.	NA
K.L.Thirani & Co. Ltd, Kolkata.	NA
Cement	
ACC Ltd (Damodar Cement), Purulia (G).	530
Ambuja Cement Ltd, Sankrail, Distt. Howrah (G).	1000
Ambuja Cement Ltd, Farakka, Distt. Murshidabad (G).	1000
Birla Corporation Ltd (Durgapur Cement Works & Durga Hitech Cement), Durgapur (G).	2300
Burnpur Cement, Asansol, Distt. Burdwan (G).	330
Century Textiles, Sonar Bangala Grinding Unit, Distt. Murshidabad	1500

(Contd.)

Table - 6 (Contd.)

Industry/plant	Capacity ('000 tpy)
Lafarge Cement Pvt Ltd, Mejia (G).	1000
Ramco Cement (formerly Madras Cement), Kolaghat, Distt. Purba Medinipur (G).	1000
Reliance Cement, Durgapur (G).	300
Swasata Cement Ltd, Purulia.	1500
Ultra-Tech Cement Works, Durgapur (G).	1200
Ceramics	
WBCDC Ltd, Kolkata.	0.18
Chemical	
Hindustan Heavy Chemicals Ltd, Khardah, Distt. 24-Parganas.	14.8 (caustic soda) 6 (Cl), 9.8 (HCl) 4.5 (ferric alum) 18.7 (H ₂ SO ₄)
Electrodes	
Graphite India Ltd, Kolkata.	NA
Fertilizer	
Tata Chemicals Ltd, Haldia.	675 (DAP)
Tata Chemicals Ltd (Phosphatic Division), Haldia, Medinipur.	160 (SSP)

(Contd.)

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Table - 6 (Contd.)

Industry/plant	Capacity ('000 tpy)
Teesta Agro Industries Ltd, Rajganj, Jalpaiguri.	165 (SSP)
Jay Shree Chemicals & Fertilizers, Khardah, 24 Parganas.	132 (SSP) 62.70 (H ₂ SO ₄)
The Phosphate Company Ltd, Rishra, Hoogly.	112.8 (SSP)
Sai Fertilizers Pvt. Ltd, Dewanmara, W. Medinipur.	132 (SSP)
Glass	
Hindustan National Glass & Industries Ltd, Rishra.	680 TPD
Iron & Steel	
Durgapur Steel Plant, SAIL, Durgapur.	3009 (sinter) 2088 (pig iron) 1800 (crude/liquid steel)
IISCO Steel Plant, SAIL, Burnpur, Distt. Bardhaman.	550 (pig iron) 2500 (crude/liquid steel) 3800 (sinter)
Alloy Steel Plant, SAIL, Durgapur.	264 (crude/liquid steel)
Rohit Ferrotech Ltd, Bishnupur.	100 (stainless steel) 71.4 (ferro alloys)
Rashmi Metaliks Ltd, Gokulpur, West Midnipore.	1800 (pellets) 580 (sinter)
Pig Iron	
Electrosteel Castings Ltd, Khardah.	400
Kajaria Iron Castings Ltd, Durgapur.	110 326 (sinter)
Tata Metaliks Ltd, Kharagpur.	345 528 (sinter)
Sponge Iron	
Adhunik Corporation Ltd, Angadpur, Durgapur.	60
Aryavrata Steel Pvt. Ltd, Lohamelya Distt. West Medinipur.	36
Howrah Gasses Ltd, Raniganj, Distt. Bardhaman.	60
Jai Balaji Sponge Ltd, Raniganj, Distt. Bardhaman.	105
Rashmi Ispat (Pvt) Ltd, Jhargram Distt. W. Meidnipur.	150
Shyam Sel Ltd, Dewabdihi, Burdwan.	100
Sunil Sponge Iron Ltd, Kolkata.	115
Ferro-alloys	
Kartik Alloys Ltd, Durgapur.	10.7 (Contd.)

Table - 6 (Concl.)

Industry/plant	Capacity ('000 tpy)
Bhaskar Shracchi Alloys Ltd, Durgapur.	40
Corporate Ispat Alloys Ltd (Abhijit Group), Durgapur.	74
Dimension Steel and Alloys Pvt Ltd, Bakura.	38
Jai Balaji Industries Ltd, Durgapur (JBIL Group).	106
Maithan Alloys Ltd, Bardhaman.	49 MVA
Modern India Con-Cast Ltd, Bishnupur, Distt. Bankura.	75
Modern India Cone-Cost Ltd, Haldia.	100
Rohit Ferro-Tech Ltd, Haldia.	100.6
Shyam Ferro Alloys Ltd, Burdwan.	100 (50 MVA)
Shyam Ferro Alloys Ltd, Durgapur.	100 (50 MVA)
Shri Vasavi Industries Ltd, Bishnupur, Distt. Bankura.	45
Srinivasa Ferro Alloys Ltd, Durgapur, Distt. Bardhaman.	84.2
Shri Goyatri Minerals Pvt. Ltd, Bishnupur, Distt. Bankura.	24
Refractory	
Alcoa-ACC Industrial Chemicals Ltd, Kalatalahat.	10
Barakar Refractories (P) Ltd, Barakar, Distt. Bardhaman.	3.6
Kero Rajendra Monolithics Ltd, Banjora.	NA
Saswat International Ltd, Kulti, Distt. Bardhaman.	NA
Vesuvius India Ltd, Kolkata.	96.5
Coke Oven Batteries	
IISCO Burnpur Works, Burnpur, Distt. Bardhaman.	1084
Petroleum Refinery	
IOCL, Haldia.	7500
TiO₂ Pigment	
Kolmak Chemicals Ltd, Kalyani, Distt. Nadia.	4.8

(G): Grinding units.

Note: Data, not readily available for fertilizer and cement Industries on respective websites, is taken from Indian Fertilizer Scenario, 2015/FAI Statistics, 2014-15 and Survey of Cement Industry & Directory, 2015 respectively.