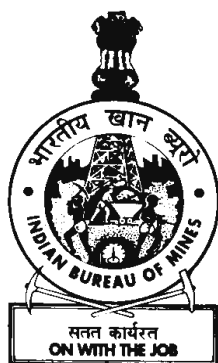


STATE REVIEWS



Indian Minerals Yearbook 2012

(Part- I)

51st Edition

**STATE REVIEWS
(Rajasthan)**

(FINAL RELEASE)

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

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RAJASTHAN

Mineral Resources

Rajasthan is the richest state in terms of availability and variety of minerals in the country and produces about 30 different minerals. Rajasthan is the sole producer of lead & zinc ores and conc., calcite, selenite and wollastonite. Rajasthan was the sole producer of garnet (gem) till 2004-05. Almost entire production of calcite and natural gypsum in the country comes from Rajasthan. The State is a major producer of asbestos, copper conc., ochre, phosphorite/rock phosphate, silver, steatite, ball clay, fluorite and felspar. The State is also an important producer of marble of various shades. Makrana area is world famous centre for marble mining.

More than 85% of the country's potash, wollastonite, lead & zinc and silver resources are located in Rajasthan. The State is said to possess substantial share of the total resources of potash (94%), lead & zinc ore (89%), wollastonite (88%), silver (81%), gypsum (82%), fuller's earth (74%), diatomite (72%), marble (64%), asbestos (62%), copper ore (50%) and rock phosphate (30%).

Important minerals that are found to occur in the State are: **asbestos (amphibole)** in Ajmer, Bhilwara, Dungarpur, Pali, Rajsamand & Udaipur districts; **ball clay** in Bikaner, Nagaur & Pali districts; **barytes** in Alwar, Bharatpur, Bhilwara, Bundi, Chittorgarh, Jalore, Pali, Rajsamand, Sikar & Udaipur districts; **calcite** in Ajmer, Alwar, Bhilwara, Jaipur, Jhunjhunu, Pali, Sikar, Sirohi & Udaipur districts; **china clay** in Ajmer, Barmer, Bharatpur, Bhilwara, Bikaner, Bundi, Chittorgarh, Dausa, Jaipur, Jaisalmer, Jhunjhunu, Kota, Nagaur, Pali, Sawai Madhopur & Udaipur districts; and **copper** in Khetri belt in Jhunjhunu district & Dariba in Alwar district. Deposits of copper are also reported at Ajmer, Bharatpur, Bhilwara, Bundi, Chittorgarh, Dausa, Dungarpur, Jaipur, Jhunjhunu, Pali, Rajsamand, Sikar, Sirohi and Udaipur districts. Occurrence of other minerals, namely, **Dolomite** in Ajmer, Alwar, Bhilwara, Chittorgarh, Dausa, Jaipur, Jaisalmer, Jhunjhunu, Jodhpur, Sikar & Udaipur districts; **felspar** in Ajmer, Alwar, Bhilwara, Jaipur, Pali, Rajsamand, Sikar, Tonk & Udaipur districts; **fireclay** in Alwar, Barmer, Bharatpur, Bhilwara, Bikaner, Dausa, Jaisalmer, Jhunjhunu & Sawai Madhopur districts; **fluorspar** in Ajmer, Dungarpur, Jalore, Jhunjhunu, Sikar, Sirohi & Udaipur districts; **garnet** in Ajmer, Bhilwara, Jhunjhunu, Sikar & Tonk districts; **gypsum** in Barmer, Bikaner, Churu, Sri Ganganagar, Hanumangarh, Jaisalmer, Jalore, Nagaur & Pali districts; **iron ore (hematite)** in Alwar, Dausa, Jaipur, Jhunjhunu, Sikar & Udaipur districts; **iron ore (magnetite)** in Bhilwara, Jhunjhunu & Sikar districts; **lead-zinc** in Zawar in Udaipur district, Bamnia

Kalan, Rajpura-Dariba in Rajsamand & Rampura/Agucha in Bhilwara district have also been reported. Lead-zinc occurrences have also been reported from Ajmer, Chittorgarh, Pali and Sirohi districts. **Lignite** deposits are found to occur in Barmer, Bikaner, Jaisalmer and Nagaur districts. Flux grade **limestone** occurs in Jodhpur and Nagaur districts and chemical grade limestone in Jodhpur, Nagaur and Alwar districts. Cement grade deposits of limestone are widespread in Ajmer, Alwar, Banswara, Bhilwara, Bikaner, Bundi, Chittorgarh, Churu, Dungarpur, Jaipur, Jaisalmer, Jodhpur, Jhunjhunu, Kota, Nagaur, Pali, Sawai Madhopur, Sikar, Sirohi and Udaipur districts. **Magnesite** in Ajmer, Dungarpur, Pali & Udaipur districts; **marble** in Ajmer, Alwar, Banswara, Bhilwara, Bundi, Chittorgarh, Dungarpur, Jaipur, Nagaur, Sikar, Sirohi & Udaipur districts; **mica** in Ajmer & Bhilwara districts; **ochre** in Baran, Bharatpur, Bhilwara, Bikaner, Chittorgarh, Jaipur, Sawai Madhopur & Udaipur districts; **pyrite** in Sikar district; **pyrophyllite** in Alwar, Bhilwara, Jhunjhunu, Rajsamand & Udaipur districts; **quartz/silica sand** in Ajmer, Alwar, Bharatpur, Bhilwara, Bikaner, Bundi, Chittorgarh, Dausa, Jaipur, Jaisalmer, Jhunjhunu, Jodhpur, Kota, Pali, Rajsamand, Sawai Madhopur, Sikar, Sirohi, Tonk & Udaipur districts; **quartzite** in Ajmer, Alwar, Jhunjhunu & Sawai Madhopur districts; **rock phosphate** in Alwar, Banswara, Jaipur, Jaisalmer & Udaipur districts; **talc/steatite/soapstone** in Ajmer, Alwar, Banswara, Bharatpur, Bhilwara, Chittorgarh, Dausa, Dungarpur, Jaipur, Jhunjhunu, Karauli, Pali, Rajsamand, Sawai Madhopur, Sirohi, Tonk & Udaipur districts; **vermiculite** in Ajmer & Barmer districts; and **wollastonite** in Ajmer, Dungarpur, Pali, Sirohi & Udaipur districts are other mineral occurrences of the State.

Other important minerals that occur in the State are: **apatite** in Udaipur & Sikar districts; **bauxite** in Kota district; **Bentonite** in Barmer, Jaisalmer & Jhalawar districts; **corundum** in Tonk district; **diatomite** in Barmer & Jaisalmer districts; **emerald** in Ajmer & Rajsamand districts; **fuller's earth** in Barmer, Bikaner & Jodhpur districts; **gold** in Banswara, Bhilwara, Dausa, Sirohi and Udaipur districts; **granite** in Ajmer, Alwar, Banswara, Barmer, Bhilwara, Chittorgarh, Jaipur, Jaisalmer, Jalore, Jhunjhunu, Jodhpur, Pali, Rajsamand, Sawai Madhopur, Sikar, Sirohi, Tonk & Udaipur districts; **graphite** in Ajmer, Alwar & Banswara districts; **kyanite** and **sillimanite** in Udaipur district; **manganese ore** in Banswara, Jaipur, & Pali districts; **potash** in Jaisalmer & Nagaur districts; **silver** in Ajmer, Bhilwara, Jhunjhunu, Rajsamand, Sikar & Udaipur districts; and **tungsten** in Nagaur & Sirohi districts (Table-1). Districtwise reserves/resources of lignite in the State are provided in Table-2.

Table – 1 : Reserves/Resources of Minerals as on 1.4.2010 : Rajasthan

Mineral	Unit	Reserves				Remaining resources						Total resources (A+B)		
		Proved STD111	Probable		Total (A)	Feasibility STD211	Pre-feasibility		Measured STD331	Indicated STD332	Inferred STD333		Reconnaissance STD334	Total (B)
			STD121	STD122			STD221	STD222						
Apatite	tonne	-	-	-	-	-	-	51521	1016000	-	-	1067521	1067521	
Asbestos	tonne	1694398	4588	797073	2496059	108785	3065861	87802	42101	4526861	57800	11119651	13615710	
Ballclay	tonne	6275408	350832	2845470	9471710	4301217	1100691	18676	-	14045369	-	22341015	31812725	
Barytes	tonne	134448	11108	77397	222953	6018	4782	37808	311500	2304688	-	2768727	2991680	
Bauxite	'000 tonnes	-	-	-	-	-	-	-	-	528	-	528	528	
Bentonite	tonne	-	11415982	574950	11990932	-	-	-24356005	222017000	139423096	257300004	11526101	423517033	
Calcite	tonne	1261868	38025	1360678	2660571	283227	144688	2642951	539285	1037038	3090782	7737971	10398542	
China clay	'000 tonnes	70012	7603	22497	100113	11524	14008	1260	4067	271314	749	332405	432517	
Copper														
Ore	'000 tonnes	25103	228	75585	100916	3375	-	10253	16513	100256	54858	-	676255	777171
Metal	'000 tonnes	214.73	3.29	973.16	1191.18	3.37	-	10.25	320.48	686.6	2179.09	-	3199.79	4390.97
Corundum	tonne	-	-	-	-	-	-	-	-	-	11925	-	11925	11925
Diatomite	'000 tonnes	-	-	-	-	634	-	-	-	-	1440	-	2074	2074
Dolomite	'000 tonnes	34309	9601	20250	64160	3559	5598	16502	25480	324604	784	396010	460170	
Feldspar	tonne	18083327	7793709	8837983	34715019	9839519	4042309	9668332	3154174	668648	25859733	-	53231216	87946235
Fireclay	'000 tonnes	8543	659	5000	14202	195	1071	2256	2580	45536	-	52221	66423	
Fluorite	tonne	24391	-	41345	65736	608000	592258	520678	1528348	489488	1294529	145183	5178483	5244219
Fuller's Earth	tonne	-	-	-	-	-	-	-	350000	189709080	-	190059080	190059080	
Garnet	tonne	6251	10700	9299	26250	214	39868	2013	17694	85690	-	172167	198416	
Gold														
Ore	tonne	-	-	-	-	-	-	4600000	50193000	59182720	-	113975720	113975720	
Metal	tonne	-	-	-	-	-	-	6.67	103.34	107.47	-	217.48	217.48	
Granite														
(Dimen.														
Stone)	'000 cu m	5581	100380	4500	110461	38462	-	-	-	9021742	20000	9080204	9190665	
Graphite	tonne	-	-	-	-	47600	-	165920	250000	1450034	-	1913554	1913554	
Gypsum	'000 tonnes	20821	81	15834	36736	3405	63397	750	710604	237550	-	1018810	1055546	
Iron ore														
(Hematite)	'000 tonnes	5169	1152	819	7139	3168	3239	-	11510	5004	-	23420	30560	
Iron ore														
(Magnetite)	'000 tonnes	2924	125	1191	4240	-	-	-	-	522590	-	522590	526831	
Kyanite	tonne	-	-	-	-	13097	-	10606	-	-	-	23703	23703	

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Table - 1 (Concl.d.)

Mineral	Unit	Reserves					Remaining resources					Total resources (A+B)		
		Proved STD111	Probable		Total (A)	Feasibility STD211	Pre-feasibility		Measured STD331	Indicated STD332	Inferred STD333		Reconnaissance STD334	Total (B)
			STD121	STD122			STD221	STD222						
Laterite	'000 tonnes	-	-	-	-	-	-	-	-	60490	62860	123350	123350	
Lead-zinc ore	'000 tonnes	20215	82178	287	102680	-	3864	13157	200065	287576	190	504852	607532	
Lead metal	'000 tonnes	398.42	1706.62	9.21	2114.25	-	46.7	272.54	2604.74	5055.46	-	7979.44	10093.69	
Zinc metal	'000 tonnes	1938.37	10223.8	11.66	12173.83	-	86.91	741.17	8821.59	12950.2	0.53	22600.4	34774.23	
Lead-zinc metal	'000 tonnes	-	-	-	-	-	-	-	-	117.55	-	117.55	117.55	
Limestone	'000 tonnes	1740173	91434	428111	2259717	141539	1607076	4438479	720874	11110360	914330	19400121	21659838	
Magnesite	'000 tonnes	1024	57	2045	3126	-	1420	76	149	49033	-	50678	53804	
Manganese ore	'000 tonnes	1134	-	647	1780	-	-	-	-	4030	-	4030	5810	
Marble	'000 tonnes	103736	172337	98	276171	-	2037	25606	90000	837615	-	955258	1231429	
Mica	kg.	7515531	21957	2767649	10305137	13633000	310	927638	48973690	19831574	50015	100090117	110395254	
Ochre	tonne	37586097	178095	13637968	51402160	15626752	11546886	16820861	896371	19196918	-	65911998	117314158	
Potash	Million tonnes	-	-	-	-	-	-	-	16936	3462	22	20419	20419	
Pyrite	'000 tonnes	-	-	-	-	13667	-	22917	26310	18392	-	90876	90876	
Pyrophyllite	tonne	139650	-	187041	326691	54308	38989	110709	68587	277249	-	782054	1108745	
Quartzite	'000 tonnes	163	-	86	249	-	18	18	-	706	-	742	991	
Quartz-silica sand	'000 tonnes	132135	10472	27757	170364	40583	13344	23433	3202	73883	-	162104	332468	
Rock phosphate	tonne	14107400	1589807	941200	16638407	20631561	7140437	13382355	152633	29893783	-	71280519	87918926	
Sillimanite	tonne	-	-	-	-	300	-	519	-	-	-	819	819	
Silver	tonne	37428349	17220000	123729631	178377980	3375000	88200	5216400	9240000	128042579	-	227542179	405920159	
Metal	tonne	1589.18	1934.4	4498.03	8021.61	270	0.26	50.42	883.8	6022.18	-	18984.59	27006.2	
Talc-steatite-soapstone	'000 tonnes	28719	2705	14770	46193	6155	7323	19196	1685	50768	5	85969	132162	
Tungsten	tonne	-	-	-	-	-	-	-	-	17000628	5964000	23928294	23928294	
Contained Ore	tonne	-	-	-	-	-	-	-	-	1421.44	90171.5	2115	93707.94	
WO ₃	tonne	-	-	-	-	-	-	-	-	13000	-	43693	43693	
Vermiculite	tonne	-	-	-	-	20623	2759	4428	-	2883	-	43693	43693	
Wollastonite	tonne	2289869	-	197253	2487122	3750545	-	3724191	76088	1213352	-	12089218	14576340	

Figures rounded off.
Resources of crude oil and natural gas in Rajasthan are included in the Western Offshore areas of India and are not available separately.

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Table – 2 : Reserves/Resources of Lignite as on 1.4.2012 : Rajasthan

(In million tonnes)

District	Proved	Indicated	Inferred	Total
Total	1167.02	2152.59	1587.40	4907.01
Barmer	495.23	1861.56	1086.45	3443.24
Bikaner	558.79	230.47	305.45	1094.71
Jaisalmer & Barmer	-	-	13.80	13.80
Jalore	-	-	76.08	76.08
Nagaur	113.00	60.57	60.35	233.92
Jaisalmer	-	-	45.26	45.26

Source: Coal Directory of India, 2011-12.

Deposits of **petroleum** are located in the Bikaner-Nagaur basin and those of **natural gas** in Jodhpur and Jaisalmer basins in the State.

Exploration & Development

ONGC and OIL continued their seismic survey and drilling for exploration of petroleum and natural gas. Two wells with a meterage of 3,166

were drilled in the State by Oil India Ltd. Details of exploration activities conducted by ONGC and OIL for petroleum and natural gas are furnished in Table - 3.

The details of exploration activities conducted by various agencies for lignite and other minerals during 2011-12 are furnished in Table - 4.

Table – 3 : Exploration for Petroleum & Natural Gas in Rajasthan, during 2011-12

Agency	Drilling					
	Seismic Survey		Exploratory		Development	
	2D(GLKM)	3D(SQKM)	Wells	Meterage(Km)	Wells	Meterage(Km)
ONGC	271.17	151.18	2	4.54	-	-

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Table – 4 : Details of Exploration Activities in Rajasthan, 2011-12

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metreage		
GSI							
Base Metals Alwar	Khera & Mundiyawas- Khera	-	-	-	-	-	Reconnaissance stage investigation (G-4) was taken up during FS 2010-12 in North Delhi Fold Belt in the aforesaid block to evaluate potential of copper and precious metal mineralisation. The area has been investigated by detailed mapping, pitting/ trenching, scout drilling and sampling. The analytical results are awaited. The work is in progress.
Bhilwara	Kamalpura & Devpura	-	-	-	-	-	Reconnaissance stage investigation (G-4) was taken up during FS 2010-12 in Pur-Banera Belt for integrated reevaluation of multi-sensor aerogeophysical anomalies in this block to identify target areas for base metal mineralisation. The work is in progress.
- do -	Karol- Rajpura	-	-	-	-	-	Reconnaissance stage investigation (G-4) initiated in FS 2009-10, was continued (Pur-Banera belt) to assess the base metal potential of the area. The calc-biotite gneiss present in the mapped area is the dominant host rock for copper mineralisation. Evidences of mineralisation are manifested in calc-biotite gneiss in the form of malachite stains and as specks, pods, stringers and veins of chalcopyrite, bornite and covellite. The dominant copper sulphide minerals are chalcopyrite and bornite and oxide mineral is hematite. Based on available analytical data of bedrock and channel samples, a copper mineralised zone having a strike length of about 300 m and width range from 80 m to 130 m with an average grade of 0.34% copper was delineated. This zone warrants further probing by scout drilling. The work is in progress.

(Contd.)

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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	Metreage		
GSI Basemetal Bhilwara	Karol- Rajpura (Pur-Banera Belt)	-	-	-	-	144	Reconnaissance stage investigation (G-4) initiated in FS 2009-10, was continued to assess the basemetal potential of the area. Chemical analysis of 100 nos. of bedrock samples received so far indicates copper content varying from 19 ppm to 0.57%. The plotting of copper content in grid samples reveals extension of the Cu zone for further 150 m in continuation of delineated Cu anomaly during field season 2009-10 (80 m to 130 m wide copper zone with an average 0.34% copper content over a strike length of 300 m). Besides the bedrock samples, a total of 44 nos. of channels/groove samples along lines (KR-5 to KR-9) have been collected. Results of channel KR-5 indicated copper content varying from 0.22% to 0.67% with an average of 0.45%. The analytical results of remaining samples are awaited. Electron Probe Micro Analysis (EPMA) studies indicates that the dominant sulphide phases are bornite and chalcopyrite with rare galena. The work has been completed.
GSI Basemetal Bhilwara	Salampura (Pur-Banera Belt)	-	-	05	-	-	Prospecting stage investigation (G-3) was taken up during FS 2010-12 to assess the basemetal potential between Pur-Dariba copper prospect and Gurla basemetal prospect. The project was taken up as a follow up action of geochemical survey (FS 2004-05). Mineralisation in this block is associated with garnet-biotite-sericite schist, magnetite bearing calcareous schist, which is intimately associated with Banded Magnetite Quartzite (BMQ) and

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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	Metreage		
GSI Basemetal Bhilwara (Contd.)	Salampura (Pur-Banera Belt)	-	-	05	-	-	calc-silicate. The area exposes quartzite, garnet-biotite-sericite schist in the south eastern part and garnet biotite schist calc-silicate rock/ amphibole marble in the north western part while the central part is characterised by predominantly inter banded sequence of garnet biotite schist/ calc-silicate with minor band of BMQ. A total of five boreholes numbered BH-7 to BH-1 were drilled. The borehole BH-7 intersected mineralised zone at various depth i.e. from 115.20 m to 117.50 m (2.30 m X 1.8% Zn & 0.3% Pb) and from 171.05 m to 172.94 m (1.89 m X 1.89% Pb+Zn). The borehole BH-8 intersected lean mineralised zone (Pb-Zn) of 50 cm and also high stray values. The borehole no BH-9, 10 and 11 intersected poor and lean mineralisation. The ore microscopic study reveals the association of pyrite, pyrrhotite, sphalerite, galena, magnetite and chalcopyrite. The EPMA study help in identifying the presence of bismuth mineral phase named Eclarite [Pb9 (Cu, Fe) B12S28]. However the core samples of BH-7 analysed bismuth content less than 50 ppm and Fe% less than 20% which are economically not significant values. The work has been completed.
GSI Basemetal Jaipur	Dholpura (North Delhi Fold Belt)	-	-	-	-	-	Reconnaissance stage investigation (G-4) initiated during FS 2009-10 was continued in North Delhi Fold Belt to assess the extent and potential of basemetal and associated gold mineralisation in the Raialo Group of rocks in Dholpura area. The lithology of the area is characterised by the presence of impure dolomite

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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	Metreage		
GSI							
Basemetal	Dholpura	-	-	05	-	-	marble, banded-haematite-quartzite often brecciated, quartzite and chlorite muscovite schist association and granite gneiss of the "Pre-Delhi" age. Ground evaluation of the 3 sets of lineaments delineated by photogeological studies has not indicated any significant association of base metal mineralisation in the area. Analytical results of bed rock samples collected from all the litho-units of the mapped area indicated Cu & 5 ppm to 1202 ppm, Zn <5 ppm to 755 ppm, Pb <25 ppm to 133 ppm, Ni <15 ppm to 140 ppm, Co <15 ppm to 255 ppm, Ag <5ppm and Au <0.05 ppm. Higher concentration of copper (>200 ppm) is found associated with brecciated BHQ and only three samples from the pit with sporadic malachite stains in the dolomite rock noticed near Village Dholpura has indicated >1000 ppm Cu. The bedrock samples from the brecciated BHQ and ferruginised zones have indicated Fe content up to 33.30%. The analytical results of the channel samples carried out across the general strike of the litho-sequence in Dholpura and Shyampura area have indicated Cu values ranging from 29 ppm to 1766 ppm, Zn 7 ppm to 250 ppm, Pb <25 ppm to 54 ppm, Ni <15 ppm to 54 ppm, Co <15 ppm to 66 ppm, Ag <5 ppm and Au <0.05 ppm with Fe content varying from 0.3% to maximum 36.92 % Fe. It is inferred based on the geochemical results and geological set up that the area around Dholpura-Shyampura is not encouraging for basemetal mineralisation. The work has been completed.
Jaipur	(North Delhi						
(Contd.)	Fold Belt)						

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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	Metreage		
GSI Basemetal Sikar	Mahawa block (North Delhi Fold Belt)	-	-	06	-	-	Prospecting stage investigation (G-3) was taken up during FS 2010-12 in North Delhi Fold Belt to assess the depth continuity of basemetal mineralisation within the Kushalgarh Formation on the western flank of the Kundla ki Dhani - Baniwala ki Dhani Dokan Copper Belt. The Mahawa block is located within the western limb of a regional F2 fold plunging moderately towards SSW known as Mahawa synform. Six boreholes have been drilled and all the boreholes have intersected sulphide mineralisation confined to the axial trace of the Mahawa synform. Drilling established sulphide mineralisation over a strike length of over 1000 m in BH-7 to BH-12. Mineralisation mostly occurs in the form of fine disseminations and streaks with occasional stringers, veins and fracture filling of pyrite, chalcopyrite, bornite, covellite, galena and specularite. The width of sulphide zone varies from 1 m to 20 m. The chemical analytical results indicate a lean 2 m copper zone with 0.15% Cu in borehole BH-7. In borehole BH - 8 the analytical result received so far indicate two copper zones viz. 4.80 m x 0.36% Cu and 2.10 m x 0.35 % Cu besides 1 m x 0.36 % Pb. In borehole BH-9 the chemical analytical results indicate a copper zone of 18.60 m x 0.30 % Cu besides two zones of lead viz. 2 m x 0.31 % Pb and 2.10 m x 0.27 % Pb. The work has been completed.

(Contd.)

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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	Metreage		
GSI							
Basemetal							
Sikar	Mahawa East Block	-	-	-	-	150	Reconnaissance stage investigation (G-4) was taken up during FS 2010-12 in North Delhi Fold Belt to assess extent and potential of copper mineralisation in the Mahawa East block located on the western flank of the Kundla ki Dhani - Baniwala ki Dhani - Dolan copper belt. The Mahawa East block is located within the eastern limb of a regional F2 fold plunging moderately towards SSW known as Mahawa synform. The block is mostly under soil cover and exposes 50 m-75 m wide dolomitic marble intercalated with calc quartz biotite schist, amphibole marble, carbon schist, calc silicate rock and quartzite belonging to the Kushalgarh Formation of the Ajabgarh Group of the Delhi Supergroup. No surface evidences of mineralisation are recorded from the exposed part except for the ferruginised zone exposed in the northern part of the mapped area and along the western fringe of the dolomitic marble intercalated with calc silicate, biotite schist, quartzite and amphibole marble. A total of 150 channel samples of channel BH-1 to BH-5 have been submitted to Chemical laboratory and the analytical results of 50 channel samples of BH-1 indicated poor values for copper. The chemical analytical results of rest of the channel samples are awaited. Few test pits were dug in the soil covered part of the area and bedrock samples were collected to test the presence of sulphide mineralisation, if any. Geological mapping around Patan has indicated a carbon phyllite band with an average width 30 m and it marks the contact between the dolomitic marble and the quartzite ridge in the southern part. Two different thick pegmatite veins (trending in different directions) have been demarcated. No surface evidences of mineralisation are recorded from the western part of the mapped area except for few sporadic occurrence of feeble malachite staining. Channel samples were collected from the malachite stained amphibole bearing dolomite and banded semipelite. Analytical results for the same are awaited. The work has been completed.

(Contd.)

STATE REVIEWS

Table – 4 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metreage		
GSI							
Basemetal Alwar	Mundiyawas- Khera	-	-	-	-	04	Reconnaissance stage investigation (G-4) was taken up during FS 2010-12 in North Delhi Fold Belt to evaluate potential of copper and precious metal mineralisation. The block is located nearly 5 km SSW of Tehsil headquarters Thanaghazi in District Alwar and forms a part of the Alwar basin of North Delhi Fold Belt comprising rocks belonging to the Thanagazi Formation of the Ajabgarh Group of the Delhi Supergroup. The rock types exposed in the Khera Block are calcareous interbanded sequence of cherty quartzite and bands of scapolite biotite rock/ felsic volcanics, dolomitic marble with amphiboles, cherty quartzite and carbon phyllite. Surface indications of mineralisation are manifested by malachite stains, presence of old workings and occasionally fresh specks of sulphides like bornite, chalcopyrite and pyrite are noticed. On the basis of mapping and sampling three such zones of mineralisation, which extend for about 300 m with an average width of 10-30 m on the surface has been delineated. Channel sampling of the mineralised zones was carried out across the general strike of the lithosequence along three profiles (cross sections CS-1 to CS-3) and analytical results indicated encouraging basemetal and associated precious metals.

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STATE REVIEWS

Table – 4 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metreage		
GSI							
Basemetal Alwar	Mundiyawas- Khera	-	-	4	-	-	Four scout boreholes were drilled to test the presence of sub surface copper and associated precious metal mineralisation in this block. All the four boreholes intersected sulphide mineralisation, which has been established over a strike length of over 600 m in BH - 1 to BH - 4. Mineralisation mostly occurs in the form of disseminations, streaks, stringers, veinlets and fractured filled chalcopyrite, pyrrhotite, pyrite and rare specks of bornite and covellite, besides veins and specks within thin quartz and carbonate veins. The first borehole BH-1 intersected a 108.10 m thick mineralised zone with 0.29% Cu and associated silver and gold. It is a first time report of 108.10 m thick Cu mineralisation from the Alwar Basin of the North Delhi Fold Belt which includes a number of lodes aggregating to 77.65 m of 0.35% Cu (at 0.2% cut-off) and 33.8 m of 0.65% Cu (at 0.5% cut-off). Drilling in borehole BH-2, along the strike also intersected similar type of sulphide mineralisation (190 m) with 0.2-0.5 % Cu (V.E.). The part analytical results of borehole BH-2 indicate a no. of lodes of 110.60 m x 0.36% Cu (at 0.2% cut-off) and 41.50 m x 0.57% Cu (at 0.5% cut-off). Borehole BH-3 is located to intersect the southern continuity of copper mineralisation of BH-1 and borehole BH-4 is located to intersect the northern continuity of the thick copper mineralisation of BH-2, which also intersected similar type of sulphide mineralisation. However, the concentration of mineralisation is less as compared to borehole BH-1 & BH-2. The work has been completed.

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STATE REVIEWS

Table – 4 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metreage		
GSI Basemetal Sikar	Nanagwar	-	-	-	-	151	Reconnaissance stage investigation (G-4) was taken up during FS 2010- 12 in North Delhi Fold Belt to delineate the zones of basemetal mineralisation and associated precious metals. The litho-units exposed in the area are garnet-mica schist, biotite schist, amphibole marble, biotite marble, scapolite amphibole marble, dolomitic marble, seapolite bearing biotite schist, semipelite and scapolite- tremolite marble belonging to the Kushalgarh Formation of the Ajabgarh Group of the Delhi Supergroup, a part of the Nim ka Thana copper belt of North Delhi Fold Belt. Surface indications of mineralisation are manifested in the form of malachite stains and specks of unaltered sulphides of pyrite, bornite in amphibole marble and in thin quartz veins within amphibole marble. Besides, siliceous vein within the mineralised zone also contains fresh sulphides. Two mineralised zones (MZ-I & MZ-II) have been delineated on surface indications in seapolite bearing amphibole marble. The strike length of mineralised zones is about 550 m and 900 m with the average width is about 25 m and 10 m respectively. The chemical analytical results of channel samples indicated copper values ranging from 31 ppm to 0.68%. Out of 151 channel samples, 85 channel samples give >0.20% Cu value. The work has been completed.

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STATE REVIEWS

Table – 4 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metreage		
GSI Basemetal Sikar	Dariba North & Dariba-Toda	-	-	-	-	153	Reconnaissance stage investigation (G-4) was taken up during FS 2010 -12 in North Delhi Fold Belt to delineate the zones of basemetal mineralisation and associated precious metals in Dariba - Baleshwar area. The Dariba North Block area exposes calcareous rock packages belonging to the Kushalgarh Formation of the Ajabgarh Group of the Delhi Supergroup. The Ajabgarh rocks of the area are bounded by the Alwar quartzite on both eastern and western margin forming the high ridges. Surface indication of sulphide mineralisation is manifested in the form of presence of malachite stains and few specks of fresh sulphides in amphibole marble and dolomitic marble. Out of 150 channel samples collected analytical results of 75 nos. are received so far indicate Cu values between 9 ppm and 7700 ppm. In this area the rocks exposed belong to the Alwar and Ajabgarh Group of the Delhi Supergroup. The massive quartzite belongs to the Alwar Group while the Ajabgarh Group is mainly dominated by calcareous and argillaceous packages. Surface evidence of sulphide mineralisation is manifested in the form of malachite staining mostly in the calcareous litho-unit. Near Palaswala-Ki- Dhani malachite staining is observed hosted in dolomitic marble interbanded with amphibole marble. It is observed

(Contd.)

STATE REVIEWS

Table – 4 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metreage		
GSI Basemetal Sikar (Contd.)	Dariba North & Dariba-Toda	-	-	-	-	153	that the mineralisation is mainly hosted in calcareous package of Kushalgarh Formation of the Ajabgarh Group. During mapping on the basis of presence of foliation parallel pervasive malachite staining in dolomitic marble interbanded with siliceous band, two mineralised zones have been delineated on surface. zone-1 is about 850 m in strike length with average width of 30 to 35m. This zone is exposed in east of Palaswala-ki Dhani and extends towards south in the western part of the study area. Zone-II is demarcated around Kalpala Ki Dhani and is about 350 m in strike length with an average width of 10 to 15 m. This zone is exposed in the eastern part of the study area. 103 nos. of channel samples and 50 nos. of bed rock samples were collected across the mineralised zones. The chemical analytical results of these samples are awaited. The work has been completed.
GSI Basemetal Jaipur	Dantali	-	-	-	-	-	Prospecting stage investigation (G-3) for basemetal and associated gold, was scheduled to be taken up during FS 2010-12 to evaluate the potential of basemetal and gold mineralisation in North Delhi Fold Belt. But as the area of investigation falls under Jamawa-Ramgarh Wild Life Sanctuary the project has been suspended.

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STATE REVIEWS

Table – 4 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metreage		
GSI Basemetal Bhilwara	Rampuriya & Gadariya- Kllera	-	-	-	-	-	Reconnaissance stage investigation (G-4) initiated during FS 2009-10 was continued in Pur-Banera Belt to identify the target areas for basemetal and gold mineralisation by ground evaluation of airborne geophysical anomalies through integrated geological and geochemical surveys. In the area aerogeophysical anomaly map shows a chain of AEM anomalies ranging from 1-6 channel that define the presence of good conductor in association with significant magnetic signature over the proposed gap area. The rocks exposed in the area belong to the Rewara Formation of Pur- Banera Group of Bhilwara Supergroup and is of Lower Proterozoic age. Detailed geological mapping revealed magnetite - amphibole - garnet quartz-mica schist (MAGQMS) garnet quartz mica schist (GQMS), 1-2 m thick band of BIF in discontinuous pattern and a thin band of meta basalt, meta rhyolite and quartz vein with Kyanite. Thin/polish section study indicated that the rock contains magnetite, sphalerite, galena, and few gold grains as major ore minerals. Garnet, quartz and amphibole represents gangue minerals. The base metal mineralisation is restricted to the BIF band. EPMA study was carried out and identified the different mineral phases, like Pb-Mn phase, Mn-Zn phase and Mn-Pb-Zn-Fe phase. Kintoreite $[PbFe_3+PO_4]_2(OH, H_2O)_6$, Hydrohetaerolite $[Zn_2Mn_3 + O_8H_2O]$, Coronadite $[Pb (Mn^{4+}, Mn^{2+})O_{16}]$, Groutite $[Mn_3O(OH)]$, Pyrolusitic

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STATE REVIEWS

Table – 4 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metreage		
GSI Basemetal Bhilwara (Contd.)	Rampuriya & Gadariya- Kllera	-	-	-	-	-	(Mn4+O ₂), Monazite [(Ce, La, Y, Th) PO ₄] and Galena. Assay results of soil samples indicates, lead in the ranges from 25 ppm to 791 ppm and line in the range from 60 ppm to 3636 ppm while concentration of other element like Cu, Ni, Co, As, Mo, Ag is insignificant. Gold values of significance were noticed in 14 soil samples, which range from 0.1 ppm to 0.24 ppm. Analytical result of few trench sample indicated Zn value ranging from 0.03% to 1.31% and Pb value from 0.02% to 0.79% over a width ranging from 5 to 12 m. A single value of gold (0.1 ppm) has also been recorded in one sample of 1m width in Trench-12. On the basis of analytical result two significant anomalous zones for Pb and Zn has been indicated. Anomalous value of Tungsten (W) ranging from 56.88 ppm to 106 ppm was recorded. The high values of W are recorded for the first time in Pur - Banera Belt. The work has been completed.
GSI Basemetal Bhilwara	Kamalpara block (Pur-Banera belt)	-	-	-	-	-	Reconnaissance stage investigation (G-4) was taken up during FS 2010-12 in Pur-Banera Belt for integrated re-evaluation of multi-sensor aerogeophysical anomalies to identify target areas for basemetal mineralisation. Kamalpara Block forms a gap area between the explored prospects i.e., Devpura in south and Banera reserve forest in North and forms a part of Pur- Banera belt. Kamalpara Block occupies the northern end of Pur-Banera Belt and is 5 km south of Banera town. Detailed geological mapping has revealed sequence comprising calc

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STATE REVIEWS

Table – 4 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metreage		
GSI Basemetal Bhilwara (Contd.)	Kamalpura block (Pur-Banera belt)	-	-	-	-	-	silicates, garnetiferous quartz-mica schist, quartz-mica schist, Banded Iron Formation (BIF), impure marble and quartzite. Evidences of mineralisation have been recorded in the garnetiferous mica schist and calc gneisses in the form of malachite stains and highly gossanised BIF bands. Two bands of BIF have been recorded. The first BIF band having a strike length of 200 m with varying width from 0.5 to 4.0 m occurs within gametiferous mica schist and second BIF band having a strike length of 70 m and 3.5 m width at the contact of garnetiferous mica schist and impure marble. Under microscope, BIF shows alternate layer of quartz, magnetite and sphalerite. The minerals identified under EPMA study of BIF samples are: Galena, Chalcocite, Bomite, Bismuth, Monazite [(Ce, La, Y, Th)PO ₄] and Zircon. Geochemical samples chemical results have indicated the Cu values for soil samples ranging from 44 to 523 ppm and for bed rock samples from <5 to 0.28%. On the basis of bedrock samples, a mineralised zone over a strike length of 350 m has been established in the garnetiferous mica schist. Some geochemical samples were also taken from BIF bands and the chemical result of these samples show Zn value up 950 ppm. Significant concentration of tungsten value has also been reported from soil samples (ranging up to 152 ppm) for the first time in Pur Banera Belt and a zone of 200 m x 100 m has been delineated. The work has been completed.

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STATE REVIEWS

Table – 4 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metreage		
GSI Basemetal Tonk	Janula- Danota	-	-	-	-	-	Reconnaissance stage investigation (G-4) was taken up during FS 2010-12 for ground evaluation of airborne geophysical anomalies by detailed geological mapping and systematic geochemical sampling to identify target areas for basemetal mineralisation. The Jaunla-Danota block is located near village Rajwas and about 9 km southwest of Newai, District Tonk-Rajasthan. Major litho-units present in the area are quartz-muscovite-biotite schist along with thin bands of migmatite and gneisses, pegmatite, quartz-epidote and quartz tourmaline veins. Petrographic studies revealed extreme alteration in the form of calcretisation of lithologies: altered amphibolite, quartz-muscovite- biotite schist and gneiss. The geochemical assay results (Cu, Pb, Zn, Ni, Co, and Ag only) of soil samples received so far has not indicated encouraging values. The assay values of Cu ranges from 7 to 21 ppm and Zn from 26 to 48 ppm whereas Pb values are <50 ppm. The work has been completed.
GSI Gold Banswara	Jagpura block	-	-	-	-	-	Reconnaissance stage investigation (G-4) was carried out during FS 2010-12, to delineate the potential zones for gold and associated basemetal mineralisation in the northern continuity of mineralisation of Bhukia gold Prospect. The rock types exposed in Jagpura Block form a part of Jagpura Formation of Debari Group of Aravalli Supergroup, which include phyllite, quartz-muscovite schist, impure dolomite marble, calc silicate, quartzite and banded plagioclase-tourmaline-quartz rock. Staurolite schist and

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STATE REVIEWS

Table – 4 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metreage		
GSI Gold Banswara (Contd.)	Jagpura block	-	-	-	-	-	andalusite schist exposed in the eastern side form the basement for these rocks and belong to Mangalwar Complex of Bhilwara Supergroup. Pegmatite and grey and white quartz veins traverse basement and overlying cover sediments. Surface manifestations of mineralisation are in form of old workings, gossans and alteration zones. Mineralisation is accompanied by extensive alteration in the form of tourmalinisation, kaolinisation, sericitisation, chloritisation and silicification. Prismatic arsenopyrite up to 1 cm in length has been observed in fresh rock along with minor pyrite, pyrrhotite, and chalcopyrite in plagioclase-tourmaline -quartz rock. Native gold is not visible to the naked eye but can be seen in polished sections under microscope as minute discrete grains within arsenopyrite. Based on bedrock/channel samples analytical results and surface indications, N-S trending surface mineralisation zone of 400 m strike length averaging a width of 50 m has been delineated. The mean gold grade for all samples is 1.18g/t while median is 0.8g/t. Basemetal values are not encouraging. Lead is below 25ppm. Zinc ranges from 6 to 45 ppm, nickel is between 15-261ppm, cobalt ranges from 15 to 198 ppm and silver is below 5 ppm. The item has been completed.

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STATE REVIEWS

Table – 4 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metreage		
GSI Gold Banswara	Gundelapara N-W Block	-	-	-	-	-	Prospecting stage Investigation (G-3) was carried out during FS 2010-12 for gold and copper, based on favourable geological setup, structure, surface manifestations and encouraging analytical results of earlier works. The rock types exposed in Gundelapara NW Block are a part of Jagpura Formation of Debari Group of Aravalli Supergroup, which include impure marble, pyritiferous keratophyre / keratophyre (quartz-albite rock) and calc silicate. Vein quartz and pegmatite occur as concordant as well as discordant intrusive in all the rock types. Surface evidences of mineralisation are in the form of small old workings, gossans, malachite stains, pyrite mineralisation, silicification, carbonatisation, epidotisation, presence of ore grinding implements and slag heap in and nearby the area. Subsurface mineralisation was confirmed by drilling and all the six boreholes intersected significant mineralisation. The cumulative thickness of gold mineralised zones (2 to 7 zones) intersected in each borehole range from 2.90 m to 31.45 m and average grade from 1.05 g/t to 2.13 g/t. The main sulphide minerals are pyrrhotite, chalcopyrite, arsenopyrite and pyrite in decreasing order. The host rock is impure marble intercalated with calcsilicate intercalations. The lateral correlations of these intersected mineralised zones are in progress. The work has been completed.

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STATE REVIEWS

Table – 4 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metreage		
GSI Iron ore Banswara	Kanpura- Bhuwer	-	-	-	-	-	Reconnaissance stage investigation (G-4) for ferrous and associated metallic minerals was carried out during FS 2010-12, to evaluate and delineate the iron ore occurrences in parts of south Rajasthan. Reconnoitry mapping in showed surface indications of mineralisation in the form of old workings. The aeromagnetic signatures with values ranging from 3000- 3200 were recorded. The litho-units exposed in the area include migmatite, silicate iron formation, dolomitic marble, quartzite, amphibolite and acid intrusives, which belong to Bamanpara-Kundli Formation of the Pre-Aravalli age. Quartz-grunerite-agnetite schist represents the silicified iron formation (SIF) units. These are lensoidal in shape and occur as discontinuous bands along NW-SE direction with steep dips towards west. SIF units occur along the foliation within sheared granites of BGC. Two moderately dipping BIF bands trending NE-SW have been delineated within Banded Gneissic complex (BGC). Analytical results of samples are awaited. The work has been completed.
GSI Lignite Nagpur	Phalki- North	-	-	-	-	-	Reconnaissance stage (G-4) exploration by scout drilling was taken up during FS 2010-12, to locate lignite-bearing blocks and to establish the stratigraphic set up in the Nagaur south sub-basin. GP survey in the area indicated a significant residual gravity low extending for a strike length of 2.4 km along N-S. A maximum of four lignite sections varying in thickness from 0.50 m to 2.48 m were intersected between 68.75 m and 262.25 m depths. Maximum cumulative thickness of lignite seam is 5 m. The grade belongs to Lignite B category. The work is in progress.

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STATE REVIEWS

Table – 4 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metreage		
GSI							
Limestone Jaisalmer	Jirag-ka-Toba- Asu-Tar	-	-	12	-	449	Prospecting stage of investigation (G-3) has been taken up during FS 2010-12 in Tertiary limestone belt, Jaisalmer basin to locate low silica SMS (LD-grade) limestone in view of increasing demand by steel plants. The main objective was to search and locate SMS grade (LD grade) at shallow depth of 50 m by augur coring drilling. The area represents a typical desert terrain with highly undulating topography in form of longitudinal dunes and intermittent depressions showing south to southwesterly slope. The area exposes the rocks of Khuiala Formation and Bandah Formation of Tertiary age and Shumar Formation of Quaternary age. The light pink, pinkish white to dirty white, fine grained, hard and massive and highly fossiliferous nodular limestone and impure clayey limestone rock units of Khuiala Formation occurs in the northern and north central parts of the area. Dirty white and yellowish white, gritty limestone belonging to Bandah Formation occurs in the central part of the area. It is exposed in a very small exposure mostly capped by the gritty and fragmentary ironstone of Shumar Formation. The fragmentary ironstone is exposed in small outcrops in the central and south central parts of the area. A total 12 numbers of borehole (BH-1 to BH-8, BH-10 and BH-11 and BH-14 and BH-15) from south western part to northern part of the area on grid pattern (500 m X 500 m) covering an area of 4 sq km area were drilled. All the boreholes intersected SMS grade and cement grade limestone popularly known as the Khuiala limestone varying in thickness from 1 m to 15 m from ground level to 50 m depth below ground level. A total of 437 nos. of core samples for chemical analysis and 12 nos. of samples for decrepitating test have been analysed and have yield encouraging results and also analytical results of core samples so far received from boreholes are encouraging and it matches the specification of SMS and cement grade limestone. The results will be estimated after receiving all the chemical analysis. The work has been completed.

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STATE REVIEWS

Table – 4 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metreage		
GSI Phosphorite Banswara	Kalinjara East of Sallupat	-	-	-	-	176	Reconnaissance stage investigation (G-4) has been carried out during FS 2010-12 in Aravalli Fold Belt for low-grade phosphorite occurrences to delineate and locate new areas of phosphorite bearing dolomitexlimestone lenses through resource survey within Kalinjara (Maton) Formation belonging to Aravalli Supergroup. Different rock types exposed in the area include phyllite, quartzite, chert, dolomite, gritty to pebbly quartzite, calcareous phyllite/quartzite and conglomerate of Kalinjara Formation of Lunavada Group(Aravalli Super Group) intruded by porphyritic grey/ pink granite which are at places sheared and foliated. These rock units are overlain by nodular limestone (Lametaf Bagh beds or infratrappean) and different flows of Deccan basalt. 176 nos. of bedrock samples were collected to see the presence of phosphate in different rock types. Total 30 cu m of pitting/trenching was carried out in Rupgarh and Shivpura areas to expose the phosphatic dolomite band and collect samples from these pits/ trenches. Bed rock samples were collected from the dolomite bands of Rupgarh, Sallopat, Shivpura, Ram-Ka-Murma, Jher Moti, Rola and Raipura areas of District Banswara. To the north of Rupgarh dolomite band is exposed intermittently for about 5 km while its width varies between 20 m and 500 m. Within this band stringers, patches and lamellae of brecciated stromatolite and lenses

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STATE REVIEWS

Table – 4 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metreage		
GSI							
Phosphorite		-	-	-	-	-	of chert were observed. The thickness of brecciated stromatolite unit varies between 2 cm and 20 cm and confined within grey to bluish grey dolomite. Pitting/ trenching has been carried out in this area and samples collected from pits/trenches have indicated presence of phosphate. The phosphatic dolomite band of Shivpura area which is about 650 m long and 10 m to 100 m wide, forms a synform and is characterised by presence of fragmentary, patchy, brecciated, laminated and columnar stromatolite randomly. Samples have been collected and submitted for analysis, results of which are awaited.
Banswara							
(Contd.)							
GSI							
Phosphorite	Rajpura	-	-	-	-	-	In Raipura area both the grey and cream coloured dolomites are present and characterised by presence of siliceous layers. The phosphatic unit in Raipura is fragmentary, patchy and laminated in character having length of 50 m (approx.) and thickness of phosphatic layer varies between 10 cm and 15 cm. In Rola area the dolomite band is about 800 m long in which phosphatic lenses are present at only two places in the form of fragmentary and laminated unit. In Ram ka Munna area no additional band could be located except the phosphatic unit already delineated earlier. The phosphatic band is characterised by presence of fragmentary, brecciated and laminated stromatolite.
Banswara							

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STATE REVIEWS

Table – 4 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metreage		
GSI Phosphorite Banswara	Sallaput	-	-	-	-	-	The phosphorite bodies occur as discontinuous lenses within the dolomite and cherty dolomite units of Aravalli Supergroup. The phosphatic dolomite was seen in the form of stromatolitic (columnar), brecciated, handed and massive units and confined to grey to bluish grey type dolomite. At places the phosphorite out crop widths are large due to shallow dip and its true thickness varies from 50 cm to 1.2 m. These stromatolitic phosphorite lenses pinch out along strike as well as along the dip. The studies made during this work indicated presence of low-grade phosphate in dark grey to bluish grey dolomite as fragmentary, patchy, brecciated, laminated and columnar stromatolite. These lenses/bands are very limited in extent for further exploration. The work has been completed.
GSI REE Pali	Trans- Aravalli	-	-	-	-	-	Reconnaissance stage investigation (G-4) was taken up during FS 2010-12 to assess the polymetallic mineral potential of the Dhani Granite. The investigation was taken up on the basis of the encouraging results obtained during specialised thematic mapping in Dhani area of District Pali during FS 2009-10, in which more than 2% of total REE was analysed in bedrock samples of granite. The granitic rocks in Dhani south block is highly jointed and fractured with

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STATE REVIEWS

Table – 4 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metreage		
GSI							
REE	Trans-	-	-	-	-	-	pods of iron carbonate
Pali	Aravalli						veins/ pseudotachylite veins are
(Contd.)							mainly mafic poor granite with
							moderate to high REE contents
							with the range of 78 ppm
							-5945 ppm. EPMA study shows
							promising indication of REE
							mineralisation in both Dhani
							granite and protolith of Dhani
							granite within iron carbonate
							veins/ pseudot-achylite. REE
							bearing phase; monazite,
							allanite, REE bearing fluoro-
							carbonate and xenotime have
							been probed. Scout drilling is
							carried out to trace the
							subsurface continuity of REE
							mineralisation. Analysis results
							of core samples of borehole
							BH-I up to 128.73 m have
							been received, in which the total
							REE ranges from 193.03 pm to
							489.3 l ppm. Results of
							geophysical logging indicate
							high radioactive signatures in
							mafic poor granite. Chondrite
							normalised REE pattern
							characteristically shows an
							enriched REE and prominent
							negative Europium anomaly,
							indicating the significant role
							of plagioclase fractionation
							from the parent magma. The work
							has been completed.

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STATE REVIEWS

Table – 4 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metreage		
DMG							
Base metal Dhaulpur	N/V Jotri Pipal & Piruka	1:10,000 1:2,000	10.0 2.0	-	-	60	Lead mineralisation was found on the western slope of hill to the east of Village Jotri Pipal. Lead is also exposed on the surface in the old pits in the form of disseminated galena specks. It is encountered in 70 x 3 m area N/V Jotri Pipal. Lead mineralisation was also noticed in the south east of Village Piruka, called as Khola Piruka. Lead mineralisation is confined to the western intercalated quartzite and phyllite contact. In Gol Pahari area mineralisation is exposed on the surface in quartzite and in the form of disseminated galena specks. Resources were not estimated.
Base metal (Tin, Tungsten, Gold)	N/V Hemardai, Karnos, Odas etc.	1:50,000 1:10,000 1:2,000	10.0 10.0 1.0	-	-	-	Rock types occurred are mica schist, quartzite, limestone, dolomite, dolomitic limestone, calc-silicate etc. About 3 km N/W of Village Hamardai within calc-silicate a ferruginous quartzite body having dimension about 50 x 3-5 m size was also mapped. It is magnetic in nature and gives black streak too.
Clay & Bajrietc	N/V Kodam desar, Chandi, Golari	1:50,000	2.0	-	-	04	The area comprises of mostly friable sandstone, tertiary clays, fuller's earth and occasionally carbonaceous zones. They occurs sub-surficially below lime kankar or mudia. These zones vary in thickness of few meters. In this area occurrences of clay was also noticed in some old pits at a depth 8-10 mts below bajri and kankar. Resources were not estimated.
DMG Dimensiond stone (Blockable granite) Jalore	Bhinmal & Raniwara	1:10,000 1:2,000	10.0 3.0	-	-	-	Granite of the Ratanagar Pahar N/V Tavab has been delineated. A total of 32 granite plot's had been notified for leasing. The rhyolite N/V Rama, Bankli, Govindla can be used as masonry stone which is highly jointed and fractured. Resources were not estimated.

(Contd.)

STATE REVIEWS

Table – 4 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metreage		
Gypsum							
Bikaner	Khajuwala & Pugal	1:50,000	500.0	-	-	27	The general thickness of gypsum varies from 1-2 m below the overburden 0.80-1.0 m. Gypsum beds are generally in horizontal bedded form, massive in nature, dull white in colour. New gypsum occurrences were located in about 10 sq km around Villages Turranwala & Nasuma. About 15 million tonnes resources of gypsum were estimated.
		1:10,000	30.0				
		1:2,000	10.0				
Gypsum							
Jaisalmer	N/V Tadana Pugal	1:50,000	150.0	-	-	15	The gypsum deposits are associated with quarternary formation. Mapped area about 4.5 km North of Tadana shows that 0.50 sq km area was potential area horizons (bed) of gypsum. Thickness of gypsum bed varies from 0.50 m - 1.80 m below top soil of 0.10 m - 0.50 m. The gypsum is earth to offwhite -grayish in colour, soft to moderately hard, porous & also mixed with sand impurities. Resources were not estimated.
		1:10,000	15.0				
		1:2,000	0.1				
Limestone							
Alwar	N/V Karoi, Khatikon-ki- Dhani	1:10,000	15.0	-	-	08	Limestone belonging to Ajabgarh Group of Delhi Super group was reported N/V Karoi & Khatikon-ki-Dhani. Limestone reportedly exists from 35-55 m depth N/V Karoi and spread over 500 x 200 m area N/V Simawata-ki-Dhani. Limestone also exists from 35 m depth to the N/W of Village Panchpahari. Resources were not estimated.
		1:10,000	4.0				
-do-	-do-	1:50,000	150.0	-	-	32	Iron mineralisation was noticed in the SW of Mewara N/V Sior, Nayagaon, Tonda & Napawala.
		1:10,000	16.50				
		1:4,000	1.00				
Limestone, quartzite, red/yellow ochre							
Jaipur	N/V Buchara Meena-ki-dhani	1:4,000	10.0	-	-	82	Limestone rock which was forming hillock N/V Meena-ki-Dhani having dimensions 1100 m x 300 - 500 m. Calcite veins of variable size were also seen in some part of the hillock. Massive quartzite, sericitic quartzite, brecciated ferruginous quartzite & Schist rocks were observed N/V Kharab. In addition to this, some pockets of clay, red/yellow ochre were also mapped.

(Contd.)

STATE REVIEWS

Table – 4 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metreage		
Limestone, Jaisalmer	N/V Sam	1:50,000 1:10,000 1:2,000	100.0 15.0 0.4	-	-	15	The area comprises of an outcrops of hard, compact limestone underlain by chalky limestone and overlain by shumar formation with sand. The limestone is creamish pinkish to whitish in colour & fossiliferous in nature. Hillocks of SMS & Cement grade limestone were mapped N/V Jagan-ki-Dhani which spread over 5 sq km area. The upper most bed of hard compact bouldry limestone varies in thickness from 3-5 m. Outcrops of limestone were also noticed N/V Turkon-ki-Basti. Resources were not estimated.
Limestone, Jaisalmer	N/V Malanwasa	1:50,000 1:10,000 1:2,000	100.0 10.0 2.0	-	-	16	The limestone which noticed N/V Malanwasa having dimension size of 1400 m x 300 m x 1-2 m, N/V Chitawa-Chanpakhur 1200 m x 300 m x 5 m. In south of Village Chitawa 1300 m x 350 m x 1-2 m and N/V Hatola 700 m x 150 m x 2-3 m. The limestone which occurred in this area is low grade to marginal cement grade. About 1.63 million tonnes limestone resources were estimatd.
Limestone, Kotra	N/V Lalahera, Mandap, Majra, Jhonpariya, etc.	1:50,000 1:10,000 1:2,000	150.0 10.0 1.0	-	-	21	The limestone deposit occurred N/V Lalahera has dimension 1200 m x 200 m x 2-3, N/V Mandap at two places 250 m x 125 m x 1-2 m and 200 m x 100 m x 1-2 m, N/V Majra, Jhonpariya 600 m x 300 m x 2 m and at Ramri 500 m x 250 m x 2 m. The limestone is mainly dirty white, greyish and light brown in colour, hard, compact and at some places cherty in nature. A total of about 3.43 million tonnes limestone resources were estimated. Out of which N/V Lalahera about 1.56 million tonnes, N/V Ramri - 0.65 million tonnes, N/V Saderi - 0.10 million tonnes, N/V Mandap - 0.19 million tonnes and N/V Majra Jhonpariya - 0.93 million tonnes.

(Contd.)

STATE REVIEWS

Table – 4 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metreage		
Limestone, Nagaur	N/V Harima	1:2,000	2.0	15	408.0	186	The main rock types investigated in area are dolomitic limestone, high-grade limestone. The limestone are bedded in nature. Cement grade limestone was intersected in all the boreholes in the form of repeated horizon having 5-15 m cumulative thickness. A total of about 48 million tonnes resources of cement grade limestone were estimated. The occurrences of greyish limestone were also noticed. The thickness found out to be 2-3 m.
-do- Nagaur	N/V Berathal	1:10,000 1:2,000	10.0 2.0	06	150.0	107	The main rock types investigated in area are dolomitic limestone, high-grade limestone. The limestone are bedded in nature. Occurrences of fine grained black coloured high grade limestone, having thickness more than 4 m were noticed. Average thickness was found to be about 5 m. Limestone occurred is mostly of chemical grade. About 10 million tonnes resources of limestone were estimated.
Limestone, Pali	N/V Murkasni- Jhak	1:50,000	11.61	42	1803.50	1160	The main litho-units are black, greyish coloured limestone, dolomitic limestone, dolomite and chert. Cement grade limestone was intersected in all the boreholes in the form of repeated horizons having cumulative thickness of 5-15 m in each boreholes except BH-6. A total of about 76.8 million tonnes resources of cement grade/high grade limestone were estimated.
Limestone, & Bajri, etc. Bikaner	N/V Kenya-ki-	1:50,000	200.0	-	-	50	New occurrences of lignite and grey-black were noticed N/V Lohiya, Mokha & Khetolai where carbonaceous zones were reported in drill cuttings of tubewells at the depth range of 150-170 mts. In BH-2 grey-black clay deposit was intersected. Lignite/lignite-shale zone was intersected at a depth of 90-126 & 132-138 m. About 0.57 million tonnes resources of lignite/shale were estimated.

(Contd.)

STATE REVIEWS

Table – 4 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metreage		
Limestone							
Bikaner	Surpura	1:50,000	105.0	-	-	-	Lignite of this area belongs to Palana formation. It is horizontal bedded at the depth of 60-100 m. Resources were not estimated, since lignite was not encountered.
Magnesite							
Udaipur	N/V Prasad,	1:50,000	200.0	-	-	10	Occurrences of magnesite was reported N/V Prasad, in the form of thin veins. Old workings comprised of oxidised ferruginous rock with malachite. Resources were not estimated.
	Kharbar, Pal	1:10,000	20.0				
	Nimboda, etc.	1:4,000	1.0				
Pyrophyllite/ Masonry stone							
Udaipur	N/V Bijawas, Bikarni etc.	1:50,000 1:10,000	200.0 20.0	-	-	10	The rock types is represented by quartz felspathic mica-schist, quartzite, phyllite, mica-schist, migmatite/composite gneiss with carbonaceous phyllite. Masonary stone band was mapped for deleneation. Minor occurrences of pyrophyllite was also noticed. In addition to this, a quartz vein over a distance of 150 m and a band of masonry stone was also mapped N/V Kharbar. Resources were not estimated.
		1:4,000	3.0				
Quartz & Feldspar							
Pali	N/V Dholi- Dungari- Khenwalkala Kot	1:50,000 1:10,000 1:2,000	150.0 10.0 2.0	-	-	10	Near Village Dholi Dungari-Khenwala-Kalakot intrusive bodies of pegmatites were mapped in 88 m x 140 m, (48 m x 401 m), (100.m x 40 m), (200 m x 84 m), (54 m x 20 m), (124 m x 30 m), (150 m x 44 m), (120 m x 50 m), (210 m x 100 m) and (94 m x 46 m). The average width of bodies varies from (48 m x 40 m) to (210 m x 100 m) in this area. The quartz vein were mapped in (50 x 15 m), (150 x 44 m), (42 x 19 m), (80 x 15 m), (66 x 20 m), (60 x 30 m), (200 x 20 m), (36 x 20 m) & (130 x 30 m). During mineral survey about 25 m wide bands of grey colour crystalline limestone were also noticed at 2 km SE of Kalabkella to Balupura. The occurrences of base metal mineralisation N/V Bhilan was also observed. Resources were not estimated.

(Contd.)

STATE REVIEWS

Table – 4 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metreage		
Quartz, Feldspar, Masonry stone, etc. Sirohi		1:10,000	10.0	-	-	13	Three pegmatite bodies are intermittently exposed N/V Chotilaki-Bhgali which have dimension about 1.5 km x 20-25 m. West of Village Kana Kola & NW/W of Village Andor (150 m x 2-30 m), (200 m x 5 -10 m) respectively. This pegmatites are mainly comprising quartz, felspar with minor amount of tourmaline & other mafic minerals. The granite which occurred here is suitable for the masonry stone. Some isolated hollocks N/V Morli, Barewara & Andor was mainly comprises of impure quartzite which can be used as masonry stone. About 2 km N/W of Village Andor, a blockable granite was noticed over an area of 400 x 100 sq m. In addition to this Gravel & Bajri deposits suitable for construction were also seen N/V Kandra, Chuli, Chotila, Panchdeol, Radbar and Posalia etc. Resources were not estimated.
		1:2,000	2.0				
Sandstone Dhaulpur	N/V Tilaua	1:50,000	105.0	-	-	19	Occurrences of buff red spotted red at places pink coloured splittable sandstone was noticed N/V Tilaua with dimensions 700 x 400 m area. Buff red, spotted red at places pink coloured blockable sandstone were also marked in 200 m x 150 m area N/V Tilaua. In addition to this offwhite blockable sandstone were noticed in 300 m x 200 m area N/V Chilachond. A total of about 5.32 million tonnes sandstone resources were estimated out of which about 0.43 million tonnes blockable sandstone N/V Tilaua, 4.03 splittable sandstone N/V Tilaua & 0.86 million tonnes splittable stone N /V Chiachond were estimated.
	Chilachound	1:10,000	15.0				
		1:3,000	1.0				
Sandstone Nagaur	N/V Nimbi Jodha, Hirawati, Audit	1:50,000 1:10,000	150.0 15.0	- -	- -	13	The main litho-units are Kanker, dolomitic limestone, shale, massive ferruginous sandstone & pinkish splittable sandstone. At some places boulders of cherty dolomitic limestone were also encountered as a capping over sandstone. The sandstone is light to dark brown, medium to coarse grained & having thickness 5-20 m. Massive sandstone was found to be spread over 50 sq km. Splittable sandstone were also observed near Village Audit and having thickness about 2-3 m. Resources were not estimated.

(Contd.)

STATE REVIEWS

Table – 4 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metreage		
Silica sand							
Dausa	N/V Girota, Sandhera	1:50,000 1:10,000	100.0 15.0	-	-	20	Quartzite is the dominating rock unit of this area. Silica sand of pale brown to off white coloured were mapped in 40-50 x 6 x 10 m area N/V Girota & 60-80 x 10-20 m area N/V Sandhera. In addition to this occurrence of red ochre were also marked in 80-120 x 5-3 on area in the north of Village Girota. About 35,250 tonnes resources of silica sand were estimated.
-do-							
(Colloidal) Karauli	N/V Jhakhoka, Lawanch, Orich, Ranipura	1:50,000 1:10,000 1:2,000	50.0 10.0 1.0	-	-	04	Occurrences of colloidal silica sand was observed at N/V Orich having dimension of 100 m x 20-40 m (ave-30) x 8-16 m (ave-12). Occurrences of clay was also noticed N/v Inaiti with dimension 30 m x 20 m x 2 m. Resources of colloidal silica sand were estimated at 0.09 million tonnes.
Siliceous earth							
Jaismer	N/V Kapuriya, Devra & Sajit	1:50,000 1:10,000 1:2,000	150.0 15.0 1.0	-	-	10	The siliceous earth is mainly comprises of colloidal silica & other siliceous matters. It resembles as chalk or clay but it contains mainly SiO ₂ & Al ₂ O ₃ as accessory & very little CaO & MgO, iron oxide. About 0.50 sq m area seems to be comprises with siliceous earth N/V Kapuriya, Devra & Sajit. Thickness of siliceous earth bed varies from 1.5-3 m overlain by sand (0.50 - 1 m) and sub bentonite clay (0.50 - 1 m). Resources were not estimated.
Wolframite							
Sirohi	Around Sirohi	1:10,000	10.0	-	-	17	In the North of Village Balda the occurrences of wolframite was noticed in the form of disseminated grains and in the form of fine stringers in the quartz veins. Occurrences of fluorite were also noticed which was associated with pegmatites. The fluorite mineral occurrences was seen in the form of veins of dimensions (10-15 m x 0.03 - 0.1 m). Some quartz-feldspar deposit in the form of pegmatite were also noticed N/V Dingar & Viroli. In addition to this about 1.7 km NE of Village Mataji Temple few gossanised patches with fine stringers of brownish metallic mineral in quartz biotite schist were also encountered in the area. Resources were not estimated.

(Contd.)

STATE REVIEWS

Table – 4 (Contd.)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metreage		
MECL Phosphorite Udaipur	Dhol-ki-Pati		1.0	19	1784.90	1501	The main rocks exposed are dolomite with minor intercalations of phyllites and quartzites. Two types of dolomites were present in this block, one which hosts the phosphorite mineralisation with capped by silcrete and the other which is non phosphatic with non silcrete cappings. The phosphorite bands have been tightly compressed to produce a series of fold (isoclinal). About 1.264 million tonnes resources were estimated with average grade of P ₂ O ₅ -8.76%.
Lignite (Barmer Coalfield) Chittorgarh	Baytu	-	-	14	5684.20	21	Promotional drilling for Coal was carried out. Positive occurrence of lignite have been noticed.
-do-	Bhurtiya	-	-	02	1182.60	-	Promotional drilling for Coal was carried out. Positive occurrence of lignite have been noticed.
-do-	East of Kurla	-	-	16	5488.90	130	Promotional drilling for Coal was carried out. Potential resources of lignite has been established.
-do-	Khuiyala	-	-	30	5800.0	18	Promotional drilling for Coal was carried out. Shallow occurrence of lignite have been established.
-do-	Kolasar Gravity	-	-	07	1285.60	-	Promotional drilling for Coal was carried out.
-do-	Magne-ki- Dhani	-	-	03	358.70	01	Promotional drilling for Coal was carried out. Positive occurrence of lignite have been noticed.

(Contd.)

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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	Metreage		
Lignite (Barmer Coalfield) Chittorgarh (Contd.)	Phalodi Gangardi & Uchara	-	-	28	8292.90	36	Promotional drilling for Coal was carried out. Positive occurrence of lignite have been noticed.
-do-	Ramgarh	-	-	26	4005.0	14	Promotional drilling for Coal was carried out. Shallow occurrence of lignite have been established.
RSM & ML Rock Phosphate Udaipur	25 km SE of Udaipur	-	-	-	-	-	As on 31.03.2012, total of 46.44 million tonnes of rock phosphate resources were estimated.

Production

The value of mineral production in Rajasthan during 2011-12 at ₹ 23,752 crore increased by 19% as compared to the previous year. Its share to the total value of mineral production in the country in 2011-12 was about 9% and is ranked at second position among the States in the country during the year under review. It is the richest State in the variety of minerals in the country and produces about 30 types of minerals. It has emerged as an important producer of petroleum (crude) and natural gas (utilised). Rajasthan was the sole producer of lead and zinc ores and concentrate, calcite, selenite and wollastonite. Almost entire production of silver and gypsum in the country was reported from the State during 2011-12.

Rajasthan was the leading producer of ochre accounting for 93%, phosphorite 90%, ball clay 83%, talc/soapstone/steatite 76%, felspar 63% and fireclay 52% of the total production in the country. Besides, it was the second leading producer of copper concentrates contributing 32%, limestone 19%, quartz 18% and petroleum (crude) 17% of the nation's output for the year

2011-12. During the year under review the production of silica sand increased by more than double. Among the important minerals, increase in production was reported in selenite 91%, ball clay 70%, quartzite 69%, silver 40%, natural gas (utilised) 37%, felspar 36%, calcite 33%, barytes 32%, petroleum (crude) 27%, ochre 15%, dolomite 12%, talc/soapstone/steatite 10%, lead conc. 9%, limestone 7%, phosphorite 6%, copper ore 3% and wollastonite 1% as compared to that in the previous year. Whereas the production of zinc concentrates decreased marginally and that of copper concentrates 8%, kaolin 17%, fireclay 22%, quartz 31%, gypsum 35%, manganese ore 55%, fluorite 65% and clay (others) 99% over the previous year (Table-5).

The production value of minor minerals was estimated at ₹ 5,961 crore for the year 2011-12.

The number of reporting mines in Rajasthan was 377 in the year 2011-12 as against 308 in previous year.

The index of mineral production in Rajasthan (base 2004-05 = 100) was 179.63 in 2011-12 as compared to 165.69 in the previous year.

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**Table – 5 : Mineral Production in Rajasthan, 2009-10 to 2011-12
(Excluding Atomic Minerals)**

(Value in ₹ '000)

Mineral	Unit	2009-10			2010-11			2011-12 (P)		
		No. of mines	Qty	Value	No. of mines	Qty	Value	No. of mines	Qty	Value
All Minerals		289		89016446	308		199853728	377		237517619
Lignite	'000t	3	1207	479400	4	1525	1071600	4	2963	1161800
Natural Gas (utilised)	m c m	-	239	894445	-	432	2765232	-	590	3776590
Petroleum (crude)	'000t	-	447	8065565	-	5149	94011369	-	65521196	27595
Copper Ore	t	-	907388	-	-	971620	-	-	1000485	-
Copper Conc.	t	2	46584	1481008	2	45174	1809887	2	41450	2747208
Iron Ore	'000t	1	13	2594	1	27	8172	1	32	9196
Lead & Zinc Ore	t	-	7101872	-	-	7539999	-	-	8041881	-
Lead Conc.	t	7	133921	1765874	6	147625	2000435	6	161157	2464159
Zinc Conc.	t	*	1279880	13058419	*	1427231	17930226	*	1412291	19893051
Manganese Ore	t	1	8443	12665	1	16638	24957	1	7483	14963
Silver**	kg	-	138550	3382924	-	148082	5430068	-	206942	11550277
Phosphorite	t	2	1393321	2981088	2	1964112	4937753	2	2082916	6278450
Asbestos	t	2	-	-	2	-	-	2	-	-
Ball Clay	t	24	676559	184938	25	776193	301368	36	1321734	578182
Barytes	t	1	5985	2457	1	6105	2433	1	8055	4417
Calcite	t	2	49309	16980	4	38826	14104	3	51499	18342
Clay (others)	t	5	163428	17561	4	7864	1140	5	50	12
Dolomite	t	2	224803	30966	1	210498	30553	1	234709	39848
Felspar	t	52	265212	43083	59	306126	89127	83	415170	143878
Fireclay	t	7	247473	40580	12	507381	91472	11	396490	80505
Fluorite	t	1	64	141	1	565	1815	1	196	561
Gypsum	t	21	3337013	994657	26	4879990	1463997	32	3159704	1306316
Kaolin	t	14	436773	83958	15	559927	169143	16	463310	109239
Laterite	t	1	-	-	1	-	-	1	-	-
Limestone	'000t	23	47180	6971469	24	44773	7212296	25	47930	6923163
Mica (crude)	t	3	4	123	3	16	381	5	113	2833
Mica (Waste & Scrap)#	t	-	3704	-	-	1204	-	-	2140	-
Ochre	t	9	1180108	212274	11	1095912	199020	16	1263944	200937
Quartz	t	33	154698	29471	32	133797	26046	47	91953	18911
Quartzite	t	1	5545	582	1	4250	1849	1	7188	863
Silica Sand	t	9	418311	103878	8	232788	74016	16	707160	185176
Talc/soapstone/steatite	t	58	647691	529722	56	664649	420656	52	730501	593740
Selenite	t	3	14598	12408	3	6736	5726	3	12852	14547
Wollastonite	t	2	132385	111930	3	183381	145958	4	184445	159931
Minor Minerals@		-	-	47505286	-	-	59612929	-	-	59612929

*Note: The number of mines excludes natural gas (utilised) and minor minerals.*** Number of mines covered under lead concentrates.**** Recovered at Chanderiya Lead-Zinc Smelter of HZL from lead concentrates produced in Rajasthan.**# Includes mine waste and that obtained while dressing of crude mica.**@ Figures for earlier years have been repeated as estimates, wherever necessary, because of non-receipt of data.*

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Mineral-based Industry

The important large and medium-scale mineral-based industries in the organised sector in the State are given in Table - 6.

Table - 6 : Principal Mineral-based Industries in Rajasthan

Industry/plant	Capacity ('000 tpy)
Cement	
ACC Ltd, Lakheri, Dist. Bundi.	480
Aditya Cement, Shambhupura.	1750
Gujarat Ambuja Cements Ltd, Rabriyawas Dist. Pali.	3600
Binani Cement, Binanipuram, Dist. Sirohi.	4850
Birla Corporation Ltd, Chittorgarh Birla Cement Works, Chandaria Cement Works.	720 1280
Grasim Industries Ltd (White Cement Division) Kharia Khangar, Dist. Jodhpur.	560 (white cement) 200 (wall putty)
J.K.Udaipur Udyog Ltd, Udaipur.	900
J.K.Cement, Nimbahera, Dist. Chittorgarh.	3300
J.K.Cement, Mangrol.	750
J.K. White Cement Works, Gotan, Dist. Nagaur.	300
J.K.Laxmi Cement, Banas, Dist. Sirohi.	5000
Manglam Cement, Morak, Dist. Kota.	2000
Neer Shree Cement, Morak, Dist. Kota.	600
Shree Cement Ltd, Andheri, Deori, Dist. Ajmer Beawar, Dist. Ajmer Rasi, Dist. Pali Kushkhera, Dist. Alwar (G).	4200 2600 3000 1200
Shriram Cement Works, Kota.	400
Chemical	
DCM Shriram Industries Ltd, Kota.	9 (rayon/yarn) 7.7 (sodium sulphate)
Modi Alkalies & Chemicals Ltd, Alwar	84.2 (caustic soda) 50.3 (Cl) 39.6 (HCl)
Ceramics	
Bikaner Ceramics Pvt. Ltd, Bikaner	2.2
Kajaria Ceramics Ltd, Bhiwadi	16.7 (million sq m)
Fertilizer	
Chambal Fertilizer & Chemical Ltd, Gadepan, Dist. Kota	1729.2 (urea)
Khaitan Chemical & Fertilizers Ltd, Dhinwa, Dist. Chittorgarh	200 (SSP)
Shriram Fertilizers & Chemicals Ltd, Shriramnagar, Dist. Kota.	330 (urea) 113.8 (caustic soda) 13.2 (bleaching powder) 61.2 (HCl) 61.2 (Cl)

(Contd.)

Table - 5 (Contd.)

Industry/plant	Capacity ('000 tpy)
Plaster of Paris	
Abhishek Plaster Industries, Baramsar, Dist. Hanumangarh.	6.1
Agrawal Industries, Nohar, Dist. Hanumangarh.	6.3
Balaji Plaster Industries, Taranagar, Dist. Churu.	6
Balaji Industries, Taranagar, Dist. Churu.	6.5
Ganesh Plaster Industries, Taranagar, Dist. Churu.	6
Gil Brothers, Taranagar, Dist. Churu.	7.1
Hind Plaster Industries, Taranagar, Dist. Churu.	6
Jaishri Plaster Industries, Taranagar, Dist. Churu.	6.3
Jagdamba Plaster Industries, Rawatsav, Dist. Hanumangarh.	7
Jai Bhavani Plaster Industries, Baramsar, Dist. Hanumangarh.	6
Jai Sriram Plaster Industries, Taranagar, Dist. Churu.	7.1
M.G. Plaster Pvt Ltd, Taranagar, Dist. Churu.	6.2
Mahabir Plaster Industries, Taranagar, Dist. Churu.	6
Multani Industries, Nohar, Dist. Hanumangarh.	8.4
R.D. Plaster Industries, Nohar, Dist. Hanumangarh.	8.4
R.N.Industries, Bikaner, Dist. Bikaner.	18
Shalimar Plaster & Chemical Industries, Sardarshahar, Dist. Churu.	14
Shri Lakshmi Gypsum, Chak, Dist. Hanumangarh.	6
Shriram Plaster, Taranagar, Dist. Churu.	6.3
SS Plaster Industries, Taranagar, Dist. Churu.	6
Shiv Bhakti Industries, Nohar, Dist. Hanumangarh.	8.4
Tiger Plaster, Sardarshahar, Dist. Churu.	11
The Sardarshahar Plaster & Minerals, Sardarshahar, Dist. Churu.	19.4
Updesh Industries Ltd, Chak, Dist. Hanumangarh.	9
Copper Smelters	
HCL, KCC, Jhunjhunu.	31(Cu cathode) 182 (H ₂ SO ₄)
Lead & Zinc Smelters	
HZL Zinc Smelter, Debari.	88 (Zn)
HZL Lead-zinc Smelter, Chanderiya.	185 (Pb) 525 (Zn) 0.74 (Cd)* 168 tonnes (Ag)* 2.1 (Cu cathode) 704 (H ₂ SO ₄)*

* Total for all smelters of HZLO.