

## 10. Outlook, Prospects and Problems

### 10.1 OUTLOOK

India occupies a very prominent position in the World with regard to barytes reserves and production. She is the second largest producer of barytes and also possesses the third largest reserves in the world. India's production has been spectacular during recent years, from 3.36 lakh tonnes in 1986 to 6.22 lakh in 1991-92, registering nearly 100 % increase in a span of five years. India is also a leading supplier of barytes to the world market. 3.85 lakhs tonnes of barytes valued at Rs. 24.4 million were exported during 1991-92<sup>1</sup>. The production has declined to 3.72 lakh tonnes in 1992-93 because of sharp fall in production of the big mines in the main producing district of Cud-dapah in Andhra Pradesh.

The total all India recoverable reserves of barytes (proved, probable and possible) are around 70 million tonnes as on 1.4.90, the bulk of the reserves nearly 96% are located in Andhra Pradesh. Out of the total recoverable reserves, about 33% of oil well drilling grade, 2.6% of chemical grade and 52% of low grade and the remaining is of other grades. At the present rate of production, (0.6 million tonnes in 1991-92) the

reserves of oil well drilling grade barytes may last for about 35 years.

Oil well drilling agencies are the major consumers of barytes in India as well as in the world. In 1991-92, 85% of the total domestic supply was consumed in oil well drilling for preparation of drilling muds. Chemicals paints, glass and asbestos products and rubber products etc. together consumed the remaining 20% of the total supply.

The Working Group on Mineral Development (1990-95), in their report (1989) has projected the demand of barytes by oil well drilling agencies, other organisations namely GSI, MECL, Departments of Mines and Geology of the States, ONGC and other industries etc. The projected demand for drilling activities is based on drilling targets of ONGC, OIL, GSI & MECL. It is estimated that for every thousand metres of drilling about 129 tonnes of barytes are required, both for on-shore and off-shore drilling (ONGC). For uses other than drilling, a substantial growth in the current levels of consumption has been assumed. Accordingly, the domestic demand of barytes is expected to be as below : (Table 10.1).

TABLE- 10.1 : DOMESTIC DEMAND FUTURE PROJECTION (THOUSAND TONNES)

Industry	1990-91	1994-95	1999-2000
1. Drilling muds			
(a) Oil-Well drilling :			
i) On-shore	103	139	146
ii) Off-shore	43	55	52
(b) GSI	2	2	2
(c) MECL	5	8	10

Industry	1990-91	1994-95	1999-2000
(d) State DMGs and Ground Water Boards	1	1	1
Total	154	205	211
2. Chemicals	18	23	30
3. Others	7	10	13
Grand total (All other industries)	179	238	254

In the report of the working group, the demand for oil well drilling for 1999-2000 has been arrived at by assuming an annual growth rate of 6% beyond 1994-95 in respect of agencies other than ONGC and OIL. The projected demand for 1999-2000 is less than the demand for 1994-95 as it excludes the demand by ONGC and OIL<sup>2</sup>.

## 10.2 PROSPECTS

The main consumers of barytes are the oil and gas well drilling industries. The export prospects depend on the level of drilling activities in these industries. In view of the anticipated expansion in oil and gas well

drilling activities, almost all over the world, the demand for barytes will grow in the coming years. The Working Group on Mineral Development (other than coal & lignite) has estimated the export demand for barytes at about 400,000 tonnes per annum till 2000 A.D.<sup>2</sup> As far as the production capacity, there may not be any difficulty and also there is no dearth of resources, India ranking third in the world possessing 14% of the world's barytes's reserves.

The trend in export of barytes for the six-year period from 1988-89 to 1993-94 is given in Table-10.2<sup>3</sup>.

TABLE -10.2 : EXPORT OF BARYTES

Year	Quantity	Quantity : Tonnes
		Value : Thousand Rupees
1988-89	433,000	153,257
1989-90	371,687	180,495
1990-91	304,150	159,836
1991-92	385,441	144,905
1992-93	38,129	33,848
1993-94	50,337	48,393

From the table, it may be seen that the exports are fluctuating. This may be due to the rise/fall in oil and gas drilling activities which in turn depend on the rise/fall, of oil and gas prices. In 1990-91

and 1991-92, India exported 3.0 and 3.85 lakh tonnes valued at Rs. 15.9 and Rs. 24.4 crores respectively. The production has also been keeping pace with the increasing export and domestic con-

sumption. The United States and middle East countries are the main buyers from India. Recently, the Commonwealth of Independent States CIS (erstwhile USSR) has also emerged as an importer of barytes powder. With the change in the political set-up of erstwhile USSR, India has got a good chance to enter the Eastern European market. In Middle East, UAE is the main buyer of Indian barytes. While there is no problem to meet this internal demand of times Indian Exporters received complaints from foreign buyers regarding the presence of high carbonates and sulphide contents from Mangampeta deposits.

In Japan and Australia, India has not been able to make any dent, basically because of cheap availability of Chinese material.

As regards future outlook for export of barytes, the present strong demand is likely to

continue and thereby India can earn valuable foreign exchange. The loading facilities at Kodur and Madras are inadequate and the facilities at Madras port for stockpiling of barytes are also inadequate which need immediate improvement to facilitate export.

#### Cost of Transport from Railway Siding to Port:

In Table-10.3 distances from loading railway stations to respective ports of shipment are given. The loading stations are quite far from the port, and the transport charges are high, thereby increasing the unit sale price. In order to boost up their export, the producers will have to find ways and means to make competitive sales to the overseas markets<sup>3</sup>.

TABLE-10.3 : DISTANCE FROM LOADING STATIONS TO PORTS

State/Mining area	Loading Railway Station	Port of shipment	Distance from station to Port (km.)
<b>Andhra Pradesh</b>			
Pulivendala	Cuddapah	Madras	266
Tadpatri	Tadpatri	Madras	373
Betamcherla	Betamcherla	Machilipatnam	419
Gajjelakonda	Gajjelakonda	Machilipatnam	233
<b>Rajasthan</b>			
Bundi	Kota	Bombay	912
Alwar	Alwar	Okla	1269

#### Quality of Product:

In the present international market, export of barytes depends on the cost of production, the prevailing international price as well as the quality of the product. For making a place in the international market, it is necessary to adhere strictly to the quality requirements of foreign buyers and maintain a quick and steady supply. As long as the specifications required by the buyers are maintained there is no dearth of export offers from the USA, Middle East countries; India

can thereby enter into East European and South Eastern markets also. Therefore the producers should set up modern processing plants to produce right quality products which could fetch a better price in the international market compensating the production and internal transportation costs from mines to the Ports<sup>3</sup>.

At present, as good grade barytes is available, it is being mined and marketed. This trend is likely to continue till the end of the current century. Thereafter, the reserves of good grade baryted

may dwindle and the country will have to depend on the low grade barytes only which will have to be mined and beneficiated to obtain the marketable product.

IBM has already conducted beneficiation studies and the established on laboratory scale that low grade barytes can be beneficiated. Commercial scale beneficiation will have to be resorted to produce marketable grade product from the low grade reserves<sup>2</sup>.

Out of total world reserves of 500 million tonnes, India with 70 million tonnes i.e. 14% of the total reserves, ranks third in the world. Therefore India has prospects to become a major world supplier of barytes. India should endeavour to produce ground barytes to American Petroleum Institute (API), U.S.A. and Oil Company Materials

Association (OCMA), U.K. specifications in order to compete and increase the export to the world market. The principal importing countries from India are USA, Japan, USSR, U.K., Saudi Arabia and UAR.

According to the estimates published by USBM in their Bulletin on barytes- 1985 edition, the U.S. demand is expected to increase from its annual average rate of 1.3% for 1990s to 3.1% by 2000 A.D. The forecast range for the demand of barytes by 2000 A.D. is 3.1 to 5.3 million tonnes.

Rest of the world demand by 2000 A.D. is expected to increase at an average annual rate of 2%. In Table-10.4, forecast range for demand of barytes and probable demand by 2000 A.D. of the U.S.A. and the rest of the world is given<sup>4</sup>.

TABLE -10.4 : FORECAST RANGE AND PROBABLE DEMAND OF THE U.S.A. AND WORLD : 2000

	(Thousand short tons) (Figures in brackets = 000 tonnes)		
	Forecast range 2000 A.D.		Probable demand
	Low	High	2000
U.S.A.	3,000 (2721)	5,300 (4801)	4,200 (3809)
Rest of the World	5,400 (4897)	6500(5895)	5,900(5351)
World Total	8,400 (7618)	11,800(11446)	10,100 (9160)

The World demand of barytes is mainly dependent on the demand by petroleum industry for oil well drilling mud. Despite the growing use of non hydrocarbon energy sources, the demand for petroleum is expected to continue to be high, necessitating increased exploration and drilling for oil and gas which leads to increased demand for barytes<sup>3</sup>.

At present, over 80% of the world barytes output is used in drilling muds in oil and gas industry. According to recent report from the market analyst Roskill "The Economics of Barytes 1991", the demand for barytes appears set to improve during the 1990s.

The global requirement for oil is expected to grow at an average annual rate of 2% till the end of this decade. Destruction of Kuwaiti and Iraqi oil fields during the Gulf war and current ban on Iraqi oil exports have resulted in decline of export of barytes to these countries. This may be a short term situation. Also due to economic crisis and the constituent republics breaking away oil production in erstwhile USSR dropped considerable. This also led to a virtual cessation of export of barytes to this country.

Roskill predicts that demand for petroleum supply will increase world over. The main supplying agency OPEC which at present supplies more than one third of the world demand, will have to gear up for more production. To establish oil and gas reserves, exploration drilling will have to be undertaken which will ensure continued demand of barytes for preparation of drilling fluids<sup>5</sup>.

In USA, one major barytes producer promoted the use of specular hematite as weighting agent which contained barytes upto 20% by weight. This material was reportedly more cost-effective in oil and gas well drilling than the weighting agent with pure barytes.

Another iron oxide weighting agent prepared by calcining pyrite ores has apparently proven satisfactory in laboratory test and field trials.

Ilmenite which has a specific gravity of 4.6 to 4.72 can replace upto 15% of the barytes in drilling mud-mix but it is more abrasive<sup>4</sup>.

### 10.3 PROBLEMS

Cuddapah district in A.P. is the major producer of barytes in India. The main constraint in mining is caused due to the present system of sub-leases. Under this system many parties have been given small sub leases within the main lease. This has resulted in a number of owners for the various sub-leases, which otherwise was a single lease or mining area. This has affected the overall efficiency of the mining operations. Even though deep holes drilling is done, blasting has to be carried out under very restricted conditions, in order to prevent the barytes pieces flying from one sub lease to another sub-lease. This affects the efficiency of drilling and blasting and in turn the loading efficiency. For this reason the output per man shift (OMS) obtained in the mechanised mines of APMDC is rather low and varies from 4.5 to 5.5. If the sub-leases are not granted out of a main lease, planning for development of the mine and higher production could be taken up in an effective way<sup>7</sup>. A national geological monument comprising the full section of barytes in the Mangampeta area (A.P.) is preserved highlighting the unique occurrence of the volcanogenic sedimen-

tary barytes of a remarkable thickness and as a 'chip' of the world's largest barytes deposit and needs to be protected and preserved at all cost.

The main problems which are identified in the barytes mines of Andhra Pradesh are as given below and need the attention of various authorities pertaining to barytes exploration and exploitation : (i) The long and narrow veins of barytes of Pulivendla area present the problems of economic depth of working, economic stripping ratios and optimum depth of changeover of mining methods from opencast to underground. On the contrary the systematic development of Mangampat deposit calls for avoiding fragmentation of the deposit i.e. granting of small leases interfering with systematic development of the deposits and ultimately an overall computerised mine planning for systematic development of the lense/deposit as a whole, should be attempted in future. This is particularly more so when the mining activity so far was concentrated in this out-cropping anticlinal portion of the lenses and further development shall have to proceed along the down-dip direction while the up-dip end of the deposit has already been excavated indiscriminately.

The barytes deposits of Alwar district are found in small veins in very remote areas. In most of the areas the approach is by Kachcha road or through foot track. Electric power is not available in such areas. Many of the deposits have not been exploited fully due to lack of infrastructure facilities.

In Alwar district, very good quality barytes (80-90% BaSO<sub>4</sub>) deposits are located. To exploit these deposits suitable infrastructure facilities to the entrepreneurs is very much necessary.

#### 10.3.1 Latest Development in Barytes Mining Policy in Andhra Pradesh

A Committee of the Legislative Assembly of Andhra Pradesh investigated illegal mining of barytes at Mangampet in Cuddapah district.

Government of Andhra Pradesh accepted the recommendation of the Committee and accordingly has taken a policy decision for cancellation

of all existing sub-leases to mine barytes, entered into between the Andhra Pradesh Mineral Development Corporation Limited (APMDC) and the sub-lessees.

The Government had taken a policy decision to reserve the entire barytes deposits in Mangampet and Anantarajupeta villages in Cuddapah district for exclusive exploitation by the Andhra Pradesh Mineral Development Corporation Limited.

#### References

1. Records- Mineral Statistics, Division Indian Bureau of Mines.

2. Eighth Five Year Plan (1990-1995) Report of the Working Group on Mineral Development Department of Mines.

3. Export Possibilities of Minerals (Other than Manganese, Fuels and Mica) Federation of Indian Mineral Industries, New Delhi, March, 1992.

4. Barytes- Mineral Facts and Problems- Department of the Interior USBM- 1985.

5. Minerals and Metals Review- New Vol. XVII No 3 March, 1992.

6. JAIN VK (JULY 1987), Journal of Mines, Metals and Fuels, Mining and Geology of barytes deposits of district Alwar, Rajasthan.

7. Information from Regional Office, IBM, Hyderabad.