



2005 Minerals Yearbook

BARITE

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In 2005, primary barite production (sold or used by producers) totaled 489,000 metric tons (t) valued at \$17.6 million. Imports were 2.69 million metric tons (Mt), exports were 93,000 t, and apparent consumption was 3.08 Mt.

Worldwide, it is estimated that oil and gas drilling accounted for 85% to 90% of barite consumption compared with 95% in the United States. The nondrilling markets for barite are larger outside of the United States, particularly in China and Europe where there is significant barium chemicals manufacturing. Data on nondrilling uses of barite are not readily available, but based on increased drill rig activity, it is estimated that worldwide consumption of barite outside of North America increased in 2005. According to the world drill rig reports, which do not cover most of the Commonwealth of Independent States or China, the average monthly world drill rig count (excluding the United States) increased by about 13% to 1,366 rigs from an average of 1,205 in 2004. The areas that experienced the largest growth in the average number of drill rigs operating were Canada (+89), the Far East (+28), and Latin America (+26). These areas accounted for nearly 89% of the total increase (Baker Hughes, 2006\$).

Barite, a name that was derived from the Greek word *barus* (heavy), is the mineralogical name for barium sulfate. In commerce, the mineral is sometimes referred to as barytes. As used in this report, the term primary barite refers to the first marketable product, which includes crude barite that usually has undergone simple beneficiation methods, such as washing, jigging, and tabling, or more complex methods, such as heavy media separation, flotation, and magnetic separation. Most crude barite requires some upgrading to minimum purity or density levels.

Production

Domestic production and sales data for barite were derived from voluntary responses to the U.S. Geological Survey (USGS) canvass of 33 known mines and grinding plants. The USGS received responses from 30 of the operations, representing 97% of barite sold and used by processors. Seven mines were included in the survey; five were producing, and two were idle. Of the producing mines, four were in Nevada, and one was in Georgia; the idle mines were in Nevada and Tennessee. There were 24 grinding plants operating at the end of the reporting year. The Georgia mine and three of the Nevada mines had associated nearby grinding plants, while one small Nevada mine supplied a grinding plant in California. Some of the ore from Nevada was sent for grinding to plants on the coast of the Gulf of Mexico. Most ore in Nevada was ground onsite or in California and sold into the petroleum drilling markets of the Western United States and southwestern Canada or to local industrial users.

Barite production in 2005 was 489,000 t, a decrease of 8% compared with that of 2004. The value of domestic production was \$17.6 million, a decrease of about 6%, although the unit value did increase slightly. The bulk of mine production was from Nevada with a small amount reported from Georgia.

In 2005, there were 14 facilities on the coast of the Gulf of Mexico (6 in Louisiana and 8 in Texas) that produced barite to American Petroleum Institute (API) specifications (of which a minimum specific gravity of 4.20 grams per cubic centimeter is the most important). These stand-alone grinding plants received mostly relatively low-priced crude barite primarily from China and India for grinding to API specifications for the oil and gas drilling market. In Louisiana, there were two grinding plants in the Amelia/Morgan City area, one in Houma, one near the Lake Charles/Westlake area, one in New Iberia, and one near New Orleans. In Texas, there were two grinding plants in Brownsville, three in Corpus Christi, one in Galveston, and two in Houston, at least one of which, in addition to supplying the drilling market, also produced commercial filler-grade barite.

Grinding plants that produce commercial filler-grade barite or chemical-grade barite are located in northern Georgia or in the Mississippi River Valley. There were three mills and one mine in Georgia, and single mills in Illinois, Missouri, and Tennessee. The location of mills near the Mississippi River allowed them to receive imported barite by barge and to ship the finished product by barge, if possible, or by rail or truck to industrial users in the Midwestern United States.

In 2005, the leading barite companies that mined and ground barite in the United States were also major oil service companies and included Baker Hughes INTEQ (a division of Baker Hughes, Inc.), Baroid (the drilling fluids and industrial barite subsidiary of Halliburton Energy Services, Inc.), and M-I SWACO (a joint venture between Smith International Inc. and Schlumberger Ltd.). Baker Hughes INTEQ, Halliburton, and M-I SWACO are world renowned and operate in many countries, mining barite and providing drilling sales and services. These three companies operated barite mines with associated beneficiation mills and grinding plants in Nevada and grinding plants in Louisiana and Texas. Excalibur Minerals Inc. (a division of Newpark Resources, Inc. of Houston) was a major barite importer and grinder in Louisiana and Texas for the oil and gas drilling market. The company also operated a grinding plant in Tennessee serving nondrilling markets. There were other, smaller companies near the Gulf of Mexico that received imported barite by ship through ports in Louisiana and Texas. Ambar Drilling Fluids LP in Houma ground imported barite for its service unit. U.S. Clay LP of Birmingham, AL, ground bentonite for its own use in Brownsville and crude barite for other grinding plants (on a toll basis). The other grinding plant in Brownsville is owned by Milwhite, Inc.

After being ground to API specifications, the barite is transferred directly to containers on barges docked in canals, lakes, and rivers near the plants for large-scale deliveries to offshore drilling platforms. These near-shoreline barite staging locations also are closer to the clusters of onshore areas with significant petroleum production in the Petroleum Administration for Defense (PAD) District 3. The PAD districts were World War II divisions of the oil-producing areas of the United States; these designations continue to be used.

The direct impact of Hurricanes Katrina (landfall on August 29, 2005, in southeastern Louisiana) and Rita (landfall on September 24, 2005, near the Louisiana-Texas border) on barite grinding facilities in the Gulf of Mexico region was relatively small. The majority of the grinding plants in Louisiana and Texas were shut down (mostly as a result of power outages) for periods ranging from a few days to a week. One Louisiana plant, however, did suffer more extensive damage, but was repaired and back in production by December.

Consumption

Apparent consumption increased by 25% to 3.08 Mt in 2005 from 2.46 Mt in 2004 (table 1). Ground barite sales increased by more than 11% to 2.72 Mt in 2005 from 2.44 Mt in 2004. In 2005, sales by grinding plants in Louisiana increased by 12% to 1.18 Mt, and in Texas, by 24% to 934,000 t, while sales by grinding plants in all other States decreased by about 5% to 612,000 t (table 2). About 2.6 Mt, or nearly 95%, of barite sales from domestic crushers and grinders was for petroleum well-drilling markets, and the remaining 5% was for industrial end uses (table 3).

Barite used for drilling petroleum wells can be black, blue, brown, buff, or gray depending on the ore body. Most barite needs to be ground to a small uniform size before it is used as a weighting agent in petroleum well-drilling mud based on specifications set by the API or the former Oil Companies' Materials Association (OCMA).

The barite is finely ground so that at least 97% of the material, by weight, can pass through a 200-mesh (Tyler) [75-micrometer (μm)] screen, and no more than 30%, by weight, can be less than 6 μm , effective diameter, which is measured using sedimentation techniques. The ground barite also must be dense enough so that its specific gravity is 4.2 or greater, soft enough to not damage the bearings of a tricone drill bit, chemically inert, and containing no more than 250 milligrams per kilogram (mg/kg) of soluble alkaline salts (American Petroleum Institute, 1993, p. 6-11). A small percentage of iron oxide is allowable. An additional benefit of barite is noninterference with magnetic measurements taken in the borehole, either during logging-while-drilling or in separate drill hole logging.

In an effort to extend barite reserves in Nevada and to hold down future price increases, M-I SWACO has proposed the reduction of the API specific gravity requirement on barite to 4.1 from 4.2. The company performed an engineering analysis that showed that, on a highly weighted drilling mud, only about an additional 1% of barite will be required to achieve the desired mud weight and that there are no effects on the

performance of the typical drilling fluid system. As a result, the company announced that, beginning in January 2006, it would be introducing a new optional grade of barite that would meet API technical standards and quality control but with a minimum density specification of 4.1. The company believes that, once the 4.1 material gains acceptance, it will become the norm, and 4.2 barite will be a premium product used for critical applications. The added cost of using more barite per barrel of drilling mud would be offset by a lower price for the 4.10-grade barite (Newcater, 2006).

According to M-I SWACO projections, economic 4.2-grade reserves in Nevada will be depleted by 2011, but the company is of the opinion that Nevada has numerous viable prospects for 4.1-grade barite that can be exploited economically. The company believes that, with the introduction of and significant shift to the 4.1 product, coupled with a modest industry investment, the reserves could be extended and would allow production to continue at current levels out to about 2016. If the 4.2 standard is not changed, as reserves decrease, M-I SWACO forecast that the industry will need to invest \$100 million to ensure 20 more years of 4.2-grade material.

Hurricanes Katrina and Rita caused damage to drill rigs operating in the Gulf of Mexico, but at the end of the year, the total number of oil and gas rigs operating in the United States was 1,471. This was an increase of more than 18% compared with 2004's end-of-year rig count of 1,243. This large increase in drill rigs exploring for oil and gas was the result of high oil and gas prices, which temporarily rose even higher in the aftermath of the hurricanes. Fueled by the dramatic increase in oil and gas prices, the increase in domestic exploration (especially for natural gas) has followed suit. The total U.S. rig count has increased by more than 70% in the past 3 years (December 2002 to December 2005), and this increased drilling activity has pushed domestic barite production up by 16% and imports of crude barite up by 74% during the same period. During the same 3-year period, the international rig count (excluding the United States) has increased by 26%. Since 1998, consumption of barite in well drilling in the United States has been driven more by the demand for natural gas than for oil. At the end of 2005, 84% of drill rigs operating in the United States (onshore and offshore) were drilling for gas (Baker Hughes, 2006^{§1}). According to the U.S. Department of Energy, Energy Information Administration (2006a[§]), the estimated annual average wellhead price of natural gas was \$7.51 per thousand cubic feet, up from the \$5.46 per thousand cubic feet average for 2004. Continued high prices for natural gas and strong U.S. demand during the year helped fuel the high level of domestic drilling activity, which resulted in increased consumption of barite.

In 2005, sales of domestic and imported barite sold for industrial uses was essentially unchanged at 141,000 t (table 3). Industrial end uses, such as barium chemicals (the largest by volume is barium carbonate), filler in paint and plastics, and powder coatings, require the barite to be ground to a small uniform size. The size depends on the use, but for paint- and plastic-grade material, it averages about 2 to 3 μm . Barite-

¹References that include a section mark (§) are found in the Internet References Cited section.

containing materials that are used for sound reduction in engine compartments are gaining market share among automotive manufacturers. Barite also is used in the base coat of automobile finishes for smoothness and corrosion resistance and continues to be used in friction products for automobiles and trucks.

Barite that is used as an aggregate in “heavy” cement or radiation shielding cement is crushed and screened to sizes ranging from 4.75 millimeters (0.187 inches) to 3.75 centimeters (1.5 inches) for the coarse grade. New Riverside Ochre Co., Inc. in Georgia is the primary supplier of barite aggregate.

Foreign Trade

Barite exports during 2005 increased by about 33% to 92,700 t. About 94% of the total was exported to Canada, about 5% went to Mexico, and the bulk of the remaining 1% went to Venezuela (table 4). Imports of crude natural barite [Harmonized Tariff Schedule of the United States (HTS) code 2511.10.5000] increased by more than 31% to 2.57 Mt; imports came from China (88%), India (11%), and Morocco (1%). Demand for drilling grade barite was so strong that imports of ground barite (HTS 2511.10.1000) increased to 84,000 t in 2005 from 5,100 t in 2004. Imports for the several forms of barite reported under the HTS nomenclature “Other sulfates of barite” decreased by about 16% to 28,600 t (table 5). Crude natural barite was imported into the United States through ports in Louisiana (1.77 Mt), Texas (758,000 t), and California (37,500 t).

Prices

The average sales value per ton for primary barite from mines and their associated beneficiation plants in the United States increased to \$35.92 per metric ton, a slight increase compared with the value of \$35.08 in 2004 (table 1). The average sales value for drilling-grade barite ground in Louisiana increased by about 7% to \$89.83 per ton. The sales value of barite ground in Texas (of which nearly 99% was drilling grade) was essentially unchanged at \$85.79 per ton and that of the other States was essentially unchanged at \$84.69 per ton compared with the 2004 values (table 2). Barite for barium chemicals, filler and extender, and glass decreased by about 3% to about \$195 per ton for 2005 (table 3).

According to Industrial Minerals (2005), at yearend, U.S. import prices for API grade, lump, including cost, insurance, and freight, U.S. Gulf Coast, decreased to \$58 to \$60 per ton for Chinese barite, while prices for Indian barite were unchanged at \$69 to \$71 per ton. Moroccan barite was listed at \$67 to \$69 per ton. Ground, OCMA, bulk, delivered to Aberdeen [United Kingdom] increased by £10 per ton to £60 to £65 per ton (about \$105 to \$113 per ton based on the average December 2005 exchange rate). Micronized, off white, minimum 99% less than 20 µm, delivered to the United Kingdom also was unchanged at £140 to £150 per ton (about \$244 to \$262 per ton).

World Review

China.—China is the leading exporter of barite and for many years has been the low-cost supplier in world markets. However,

from December 2003 to December 2005, the published import price of Chinese barite increased by about 33%, and prices for barite from the other major exporting countries (India and Morocco) rose similarly. The factors that pushed up Chinese prices were high ocean freight costs, port congestion, problems with internal freight logistics, and the lowering of the tax rebate on barite exports.

Kazakhstan.—As a result of the boom in oil and gas exploration and development in Kazakhstan and the surrounding region in recent years, the country has increased production of barite ore and barite concentrates. The barite producers include LLC Barite-Oil-Kentau and JSC Yuzhpolimmetall (Kentau Branch) in Yuzhno-Kazakhstansky Oblast, JSC Vostochnoe Rudoupravlenie and LLC Zhartas in Zhambyl Oblast, and JSC Zhalair in Karaganda Oblast. In 2005, production of concentrates was estimated to be 120,000 t, which would have included about 70,000 t for export and 50,000 t for domestic consumption (Petrov and Dotsenko, 2005).

Russia.—Prior to the breakup of the Soviet Union, the majority of barite consumed by Russia was supplied by Kazakhstan. In the 1990s, supplies of barite from Kazakhstan decreased significantly, which led to the development of barite deposits within the boundaries of the new Russian state. At present, there are three companies involved in mining barite and producing barite concentrates—JSC Salair GOK (in Kemerovo Oblast), PJSC Barite (in Khakassia Republic), and PJSC Khoilinsky GOK (in Komi Republic). Annual production of barite concentrates is in excess of 60,000 metric tons per year (t/yr), and the country imports an additional 20,000 to 30,000 t/yr. Consumption patterns are roughly 77% for oil and gas drilling, 10% for chemical uses, 10% for building materials, and 3% for other uses (Petrov and Dotsenko, 2005).

Outlook

Continuing the trend of recent years, barite consumption in the United States is expected to increase. Since 2002, U.S. consumption has increased by nearly 61%, driven by the Nation’s demand for natural gas. Although total demand for natural gas has essentially been unchanged during the past 10 years, it still totaled nearly 22 trillion cubic feet of gas in 2005. More importantly, the average annual wellhead price for natural gas has increased by more than 240% since 1999, which has made exploration for and development of domestic gas economic (if not highly profitable). The increase in natural gas prices has led some consumers to switch to alternative fuels where possible, which explains the flat demand even though the economy has grown dramatically during the same time period. The short-term domestic forecast for natural gas demand calls for a 1.7% decrease in 2006 but an increase of 4.2% in 2007, although severe winter weather could change these forecast numbers (U.S. Department of Energy, Energy Information Administration, 2006b§). As a result, the level of drilling activity in North America is expected to remain high. In 2005, most of the drill rigs in North America were directed toward gas (84%), and that trend is expected to continue. Through the first half of 2006, the U.S. rig count continued to rise and averaged 1,576 rigs per month (Baker Hughes, 2006§).

The U.S. Congress has been working on legislation to open up previously closed areas of the outer continental shelf to oil and gas exploration. If these areas are opened, the increase in drilling will be even more dramatic, and demand for barite will rise accordingly.

If the information on the depletion of Nevada reserves is borne out, then failure to lower the API-specific gravity specification will likely result in higher prices and greater reliance on imports. There is some indication that high-grade ores are being depleted in other producing countries. The United States is already importing more than 80% of the barite consumed annually. Reduced domestic production of barite would not only increase the Nation's reliance on imports but would also increase the cost of oil and gas exploration in the Western United States by increasing the delivered cost of barite, which would have to be shipped from grinding plants in Louisiana and Texas.

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TABLE 1
 SALIENT BARITE STATISTICS¹

(Thousand metric tons and thousand dollars)

	2001	2002	2003	2004	2005
United States:					
Barite, primary:					
Sold or used by producers:					
Quantity	400	420	468	532	489
Value	11,000	12,200	13,900	18,700	17,600
Exports:					
Quantity	45	47	44	70	93
Value	5,330	4,230	4,620	6,400	9,930
Imports for consumption: ²					
Quantity	2,510	1,540	1,650	2,000	2,690
Value	125,000	81,300	85,500	109,000	162,000
Consumption, apparent ³	2,870	1,920	2,080	2,460	3,080
Crushed and ground, sold or used by processors: ⁴					
Quantity	2,670	1,980	2,230	2,440	2,720
Value	206,000	151,000	165,000	208,000	238,000
World, production	6,780 ^r	6,490 ^r	6,790 ^r	7,440 ^r	7,870 ^e

^eEstimated. ^rRevised.

¹Data are rounded to no more than three significant digits.

²Includes crude, ground, and other barite imports.

³Sold or used plus imports minus exports.

⁴Includes imports.

TABLE 2
CRUSHED AND GROUND BARITE SOLD OR USED BY PROCESSORS IN THE UNITED STATES, BY STATE^{1,2}

State	2004			2005		
	Number of plants	Quantity (thousand metric tons)	Value (thousands)	Number of plants	Quantity (thousand metric tons)	Value (thousands)
Louisiana	6	1,050	\$88,400	6	1,180	\$106,000
Texas	8	753	64,900	8	934	80,100
Other ³	10	641	54,300	10	612	51,800
Total	24	2,440	208,000	24	2,720	238,000

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes imports.

³Includes California, Georgia, Illinois, Missouri, Nevada, and Tennessee.

TABLE 3
CRUSHED AND GROUND BARITE SOLD OR USED BY PROCESSORS IN THE UNITED STATES, BY USE^{1,2}

(Thousand metric tons and thousand dollars)

Use	2004		2005	
	Quantity	Value	Quantity	Value
Barium chemicals, filler and/or extender, glass	142	28,400	141	27,400
Well drilling	2,300	179,000	2,580	210,000
Total	2,440	208,000	2,720	238,000

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes imports.

TABLE 4
U.S. EXPORTS OF NATURAL BARIUM SULFATE (BARITE), BY COUNTRY¹

Country	2004		2005	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Azerbaijan	40	\$5	--	--
Brazil	9	3	25	\$8
Canada	61,800	4,850	86,700	7,870
China	--	--	103	77
Colombia	--	--	5	3
Costa Rica	133	71	76	41
Czech Republic	8	63	--	--
Ecuador	6	36	--	--
France	10	33	--	--
Germany	8	46	--	--
Greece	2	7	1	4
Hong Kong	11	38	--	--
India	--	--	3	8
Japan	110	94	37	37
Korea, Republic of	5	3	--	--
Kuwait	54	9	--	--
Mexico	7,580	956	4,340	1,130
Philippines	49	60	10	20
Senegal	103	16	--	--
Singapore	--	--	45	8
South Africa	1	3	--	--
Taiwan	--	--	16	46
Thailand	14	63	--	--
United Kingdom	3	20	--	--
Venezuela	53	20	1,320	677
Total	69,900	6,400	92,700	9,930

-- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

Source: U.S. Census Bureau.

TABLE 5
U.S. IMPORTS FOR CONSUMPTION OF BARITE, BY COUNTRY¹

Country	2004		2005	
	Quantity (metric tons)	Value ² (thousands)	Quantity (metric tons)	Value ² (thousands)
Crude:				
China	1,800,000	\$83,000	2,280,000	\$120,000
India	156,000	7,610	276,000	16,500
Mexico	--	--	90	6
Morocco	--	--	19,800	1,280
Total	1,960,000	90,600	2,570,000	137,000
Ground:				
China	4,630	651	14,400	1,520
India	--	--	44,500	4,230
Japan	--	--	214	32
Mexico	475	49	280	30
Morocco	--	--	24,600	2,440
Total	5,100	700	84,000	8,250
Other sulfates of:				
Belgium	20	14	210	119
Canada	920	729	106	38
China	17,400	3,670	13,700	3,550
Finland	(³)	2	1	32
France	--	--	20	12
Germany	10,300	9,390	9,900	8,570
India	1	5	--	--
Italy	4,040	2,350	3,910	2,410
Japan	884	1,530	509	1,070
Mexico	--	--	108	61
Spain	246	170	148	169
Switzerland	--	--	9	6
Total	33,800	17,800	28,600	16,000

-- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Cost, insurance, and freight value.

³Less than ½ unit.

Source: U.S. Census Bureau adjusted by the U.S. Geological Survey.

TABLE 6
U.S. IMPORTS FOR CONSUMPTION OF BARIUM CHEMICALS¹

	2004		2005	
	Quantity (metric tons)	Value ² (thousands)	Quantity (metric tons)	Value ² (thousands)
Chloride	130	\$135	94	\$138
Oxide, hydroxide, peroxide	3,540	3,360	3,760	3,780
Nitrate	4,300	5,910	3,280	8,570
Carbonate, precipitated	10,200	5,190	6,920	4,150

¹Data are rounded to no more than three significant digits.

²Cost, insurance, and freight value.

Source: U.S. Census Bureau.

TABLE 7
BARITE: WORLD PRODUCTION, BY COUNTRY^{1,2}

(Metric tons)

Country	2001	2002	2003	2004	2005 ^c
Afghanistan ^{e,3}	2,000	2,000	2,000	2,000	1,500
Algeria	43,020	51,733	45,649	47,945	52,813 ^{p,4}
Argentina	6,955	3,048	6,934 ^r	2,762 ^r	3,000
Australia ^c	20,000	20,000 ^r	20,000	20,000	20,000
Belgium ^c	30,000	30,000	30,000	30,000	30,000
Bolivia	6,253	15,556	1,851	5,774 ^r	5,800
Bosnia and Herzegovina ^c	2,000	2,000	1,851 ⁴	1,900 ⁴	1,900
Brazil, beneficiated	54,790	53,098 ^r	57,452 ^r	59,612 ^r	60,500 ^p
Bulgaria ^{e,5}	125,000	100,000	95,000	95,000	95,000
Burma	31,015 ^r	15,050	4,850 ^r	2,224 ^r	3,000
Canada	23,000	17,417 ^r	27,369 ^r	20,601 ^r	21,000 ^p
Chile	584	384	229	31 ^r	30
China ^c	3,600,000	3,100,000	3,600,000 ^r	3,900,000	4,200,000
Colombia ^c	600	600	600	600	600
Ecuador	1,181	1,180 ^e	2,139	2,350	2,400
Egypt ^c	500	500	500	500	500
France	81,000	80,000	81,000	82,000 ^e	82,000
Georgia ^c	15,000	15,000	15,000	15,000	15,000
Germany, marketable Ba ₂ SO ₄	108,100	100,993 ^r	109,506 ^r	93,624 ^r	95,000
Greece, crude ore ^c	800	800	800	800	800
Guatemala ^c	700 ⁴	100	100	70 ^{r,4}	70
India ^c	850,000	916,000	675,000	723,000	1,000,000
Iran ³	195,539	178,652	196,169 ^r	275,607 ^r	280,000
Italy ^c	25,000	25,000	25,000	25,000	12,000
Kazakhstan ⁶	72,000 ^r	79,000 ^r	79,000 ^r	120,000 ^r	120,000
Korea, North ^c	70,000	70,000	-- ^r	-- ^r	--
Korea, Republic of	200 ^r	78 ^r	140 ^r	50 ^r	100
Laos	3,300 ^r	12,695	18,070	10,470 ^e	15,000
Malaysia	649	3,082	--	-- ^e	--
Mexico	142,017	163,620	287,451	306,668 ^r	274,700
Morocco	471,102	469,934	358,500 ^r	355,800 ^r	360,000
Nigeria ^{e,7}	5,000	5,000	5,000	5,000	5,000
Pakistan ^c	27,200 ^r	26,100 ^r	40,800 ^r	44,200 ^r	44,000
Peru	11,031	3,806	2,906	3,606 ^r	3,700 ⁴
Poland	2,500	2,700	3,000 ^e	3,000 ^e	2,500
Romania, processed	2,849	100	2,000 ^e	8,000 ^e	5,000
Russia ^c	64,000 ^r	59,000 ^r	78,000 ^r	63,000 ^r	63,000
Saudi Arabia ^c	9,000	9,000	9,000	10,000	--
Slovakia, concentrate	14,000	11,000	14,000 ^e	14,000 ^e	10,000
Spain, marketable Ba ₂ SO ₄	50,640	52,494	44,660	45,000 ^e	45,000
Thailand	23,559	137,469	115,600	211,278 ^r	120,000
Tunisia	2,208	5,539	3,000	1,813 ^r	--
Turkey	57,373	106,843	119,648	134,504 ^r	155,000
United Kingdom ^c	55,000	66,000	59,000	60,000	60,000
United States ⁸	400,000	420,000	468,000	532,000	489,000
Vietnam	71,114	60,228	81,456	101,040	116,000 ⁴
Total	6,780,000 ^r	6,490,000 ^r	6,790,000 ^r	7,440,000 ^r	7,870,000

^cEstimated. ^pPreliminary. ^rRevised. -- Zero.

¹World totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

²Table includes data available through June 10, 2006.

³Data are for fiscal year beginning March 21 of that stated.

⁴Reported figure.

⁵Marketable concentrate based on reported or estimated noncountry data but is in accord with the trends in reported Bulgarian raw barite production.

⁶Estimated marketable barite, however, reported figures are as follows, in metric tons: 2001—154,200; 2002—154,500; 2003—214,200; 2004—310,700; and 2005—251,000.

⁷Considerably more barite is produced, but it is considered to be commercially unusable.

⁸Sold or used by producers.