Barite is the mineralogical name for barium sulfate and was derived from the Greek word “barus,” meaning heavy. In commerce, the mineral is sometimes referred to as “heavy spar” or “barytes.” Spar means almost any transparent or translucent, readily cleavable, crystalline mineral having a vitreous luster. Few mines in the United States produce a “spar” grade barite.

The term “primary barite,” as used in this report, refers to the first marketable product. This product includes crude barite, and the products of simple beneficiation methods such as washing, jigging, heavy media separation, tabling, flotation, and magnetic separation. Most primary barite requires grinding to small, uniform size before it is used as a weighting agent in petroleum well drilling mud [American Petroleum Institute (API) or Oil Companies’ Materials Association (OCMA)] specification barite or as an addition to industrial products. This grinding usually was not performed at the mine site because railroad tariffs were higher for finished barite than for crude barite. There was some grinding of barite at the mine sites in Nevada to supply Western States, Western Canadian Provinces, and Alaska. Barite for petroleum well drilling, a weighting agent in the drilling mud, can be any color but must be only finely ground, dense, soft, and chemically inert. Barite for this purpose must have a specific gravity of 4.2 or greater, be free of soluble salts, and 90% to 95% of the material must pass through a 325-mesh screen. A small percentage of iron oxide is allowable. About 91% of the barite sold in the United States in 1995 was used as a weighting agent in oil- and gas-well-drilling fluids, mostly in the Gulf of Mexico region, with much smaller amounts used in the Pacific coast areas. Petroleum well drilling barite can be blue, black, brown, or gray depending on the ore body.

One domestic barite producer has named its white technical grade barite as “baryte” to distinguish it from the petroleum well drilling grade. The technical grade end uses are for filler and extender grades, colorants, weighting agents, and feedstock into barium chemicals. The industrial end uses of barite included paint; rubber; plastics; photographic print paper; batteries; brake and clutch pads for automobile and trucks; gastrointestinal x-rays; barium chemicals for the glass, ceramic products, brick and cement block industries; and barium ferrites and titanates. Industrial weighting agents encompass such things as barite in truck rubber mud flaps to prevent the flap from being lifted by the air flow around the truck, and barite in rubber rug backing to keep the rug relatively stationary.

Legislation and Government Programs

The Environmental Protection Agency (EPA) deleted barium sulfate from the category “barium compounds” on the list of toxic chemicals for which reporting was required under the section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA). This action was based on EPA’s conclusion that barium sulfate met the deletion criteria of EPCRA section 313(d)(3). By promulgating this rule, EPA was relieving facilities of their obligation to report releases of barium sulfate that occurred during the 1993 reporting year, and releases that will occur in the future.

Production

Domestic sales data for barite were developed by the U.S. Geological Survey (USGS) from a voluntary survey of U.S. operations. Of the 34 operations to which a survey was sent, 32 reported, representing about 99% of the primary barite sold or used by producers. Of the 34 operations surveyed, there were 14 mines and 20 mills. Of the 14 mines surveyed in 1995, Baroid’s Lakes Mine was closed, while Mountain Mineral’s Elk Creek Mine and Milpark’s Miller Mine were idle, leaving 11 mines operating. Of the 20 milling plants surveyed, Standard Magnesia’s Fallon Mill was closed and dismantled, Circle A’s mill was idle, and 18 mills (beneficiating plants and crushers and grinders) were operating. The quantity of primary barite sold or used by producers declined by about 7% from that of 1994.

Consumption

Demand for petroleum-well-weighting barite has been relatively steady over 1994 and 1995 owing to deep gas well drilling off the coast of Louisiana and Texas. Production and quality problems developed in late 1993 in both China and India, and continued through 1994 and 1995, which resulted in reduced exports for those two countries to the Gulf Coast. Domestic producers were able to fill the deficiency caused by these foreign producers’ problems with domestically produced barite. One domestic API grade supplier deemed the drilling mud grade barite market to have been in reasonable balance at the price range. Domestic industrial grade suppliers have been reluctant to comment on the market balance. For 1995, the domestic producers supplied a broad range of barite quality, excluding only the U.S. Pharmacopoeia barite.

Crushers and grinders reported only a division of sales between petroleum-well-weighting barite and “industrial” barite. The consumption of industrial barite has not been well reported to the USGS. No subdivisions of industrial end uses were reported because they were less than approximately 20,000 metric tons per year.

Domestic API barite consumption was driven by oil and gas drilling activity, particularly those wells deeper than about 2,100 meters (7,000 feet) because of increasing petroleum reservoir pressures. Barite is an environmentally beneficial mineral which, owing to its density of 4.2, exerts pressure down the drill...
hole counterbalancing the upwardly vented petroleum reservoir pressure. Uncounterbalanced pressure allows the crude oil and gas to spray (gush) out of the well. Gushers of crude petroleum were extreme fire hazards, wasteful of crude petroleum, and visual and chemical pollution to the surface area surrounding the well.

Traditionally, the demand for barite has been explained by the prices of the petroleum products and the numbers of drill rigs used in the United States during the reported year. There has been a technological shift in the well-drilling industry reducing the demand for barite by making well drilling more efficient. For yearend 1995, the week-average futures price for light sweet crude oil rose by 12.3% to $19.17 per barrel compared with $17.07 per barrel at yearend 1994. For the first half of 1995, the price for light sweet crude oil rose to $17.74 per barrel and then rose 8% for the second half of 1995. The rising prices may have encouraged some new activity in oil drilling in that short a period. The natural gas futures price started the year at about $1.59 per million British Thermal Units (Btu). That price remained through the first half of the year, then rose to $2.85 per million Btu, about a 79% increase, by yearend. The number of gas-directed rigs, as reported by the Baker-Hughes rotary rig count, was essentially constant, 428 rigs at the beginning and 420 rigs at yearend, but was at 362 rigs at midyear. The “Total U.S.” Baker-Hughes rotary rig count declined by about 6% from 791 rigs at the end of 1994 to 745 rigs at the end of 1995.

The explanation of this decline in drilling rigs along with good barite consumption is new technologies. Owing to 3D and 4D seismic technology, fewer wells are required to establish and develop reserves. Other technologies, such as horizontal and directional drilling, have reduced the number of wells needed to access a reservoir effectively. Measurement-while-drilling, logging-while-drilling, increased drill bit effectiveness and durability, new well completion techniques, and new well stimulation services have all combined to increase flow rates, reduce well drilling and maintenance costs, and reduce the number of wells while keeping product flowing profitably at present prices.

**Prices**

The nominal average weighted price for sales of all barite by U.S. producers declined from a revised $32.80 per ton in 1994 to $31.90 in 1995, or about 3%. Nominal average prices for the crushed and ground barite rose from $69.65 per ton in 1990 to $84.48 per ton in 1992 and declined to $68.20 per ton in 1995. International prices for midyear, as reported by Industrial Minerals, were as follows: unground, OCMA/API bulk, specific gravity 4.2, free on board (FOB) Morocco, $37 to $40 per ton; ground, bagged, specific gravity 4.22, FOB Morocco, $75 to $80 per ton; ground OCMA/API big bags (1.5 tons) FOB, South Turkey, $55 to $58 per ton; ground OCMA bulk, delivered Aberdeen, $71.73 to $82.89 (£45 to £52) per ton; delivered Great Yarmouth, $82.89 to $89.27 (£52 to £56) per ton; micronised, off white minimum 99% less than 20 microns delivered United Kingdom (UK) $223.16 to $239.10 (£140 to £150) per ton; and ground, white paint grade 96% to 98% BaSO4, 350 mesh, 1-5 tons delivered UK, $311 to $351 (£195 to £220) per ton.

**Outlook**

Barite sales are not likely to increase greatly above 1995 levels in the United States and could decline. Much of the exploratory and development drilling, 90% of the U.S. demand, has moved away from the United States owing to the potential for large discoveries of oil and gas in Asia and the former Soviet Union, and the environmental concerns in the United States. The market for exported barite was small because barite was found around the world and was not shipped great distances, except by water, because of its relatively low unit value.

Assuming that the demand for barite was driven primarily by gas well drilling, not petroleum, it seems clear that if the gas prices in the United States stay at $1.50 to $2.00 per million Btu for the foreseeable future, gas exploration and development may continue as long as large-sized, profitable gas discoveries are completed. This would maintain the demand for API barite at approximately the present level in constant dollars. However, the number of large undiscovered gas reserves was unpredictable but likely to be small.

**References**

4. ———. V. 93, No. 27, July 3, 1995, p. 3.
5. Reference cited in footnote 3.
7. Reference cited in footnote 5.

**OTHER SOURCES OF INFORMATION**

**U.S. Geological Survey Publications**

Barite. Ch. in Mineral Commodity Summaries, annual.

**Other Sources**


### TABLE 1
SALIENT BARITE AND BARIUM CHEMICAL STATISTICS 1/ 2/

(Thousand metric tons and thousand dollars)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>United States:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Barite, primary:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sold or used by producers</td>
<td>448</td>
<td>326</td>
<td>315 3/</td>
<td>583 t/</td>
<td>543</td>
</tr>
<tr>
<td>Value</td>
<td>$21,300</td>
<td>$19,600</td>
<td>$19,300 3/</td>
<td>$19,100 t/</td>
<td>$17,300</td>
</tr>
<tr>
<td>Exports</td>
<td>43</td>
<td>12</td>
<td>18</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td>Value</td>
<td>$3,300</td>
<td>$1,810</td>
<td>$2,610</td>
<td>$1,850</td>
<td>$2,020</td>
</tr>
<tr>
<td>Imports for consumption 4/</td>
<td>887</td>
<td>354</td>
<td>804</td>
<td>1,070</td>
<td>1,040</td>
</tr>
<tr>
<td>Value</td>
<td>$41,300</td>
<td>$17,300</td>
<td>$34,200</td>
<td>$47,200</td>
<td>$52,500</td>
</tr>
<tr>
<td>Consumption (apparent) 5/</td>
<td>1,290</td>
<td>668</td>
<td>1,100</td>
<td>1,640</td>
<td>1,570</td>
</tr>
<tr>
<td>Crushed and ground (sold or used by processors) 6/</td>
<td>1,270</td>
<td>999</td>
<td>1,090</td>
<td>1,250</td>
<td>1,210</td>
</tr>
<tr>
<td>Value</td>
<td>$103,000</td>
<td>$84,400</td>
<td>$79,200</td>
<td>$81,100</td>
<td>$82,500</td>
</tr>
<tr>
<td><strong>World:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production</td>
<td>5,170 t/</td>
<td>4,470 t/</td>
<td>4,140 t/</td>
<td>4,210 t/</td>
<td>4,410 t/</td>
</tr>
</tbody>
</table>

1/ Data are rounded to three significant digits.
2/ Barium chemicals data withheld to avoid disclosing company proprietary data.
3/ Data excludes run-of-mine.
4/ Includes crude and ground.
5/ Sold or used plus imports minus exports.
6/ Includes imports.

### TABLE 2
U.S. PRIMARY BARITE SOLD OR USED BY PRODUCERS, BY STATE 1/

<table>
<thead>
<tr>
<th>State</th>
<th>Number of operations</th>
<th>Run of mine</th>
<th>Benificiated material 2/</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Quantity (thousand metric tons)</td>
<td>Value (thousands)</td>
<td>Quantity (thousand metric tons)</td>
</tr>
<tr>
<td>Nevada</td>
<td>5</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>Other States</td>
<td>6</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>Total</td>
<td>11</td>
<td>222</td>
<td>$3,330 t/</td>
<td>361</td>
</tr>
</tbody>
</table>

1/ Data are rounded to three significant digits; may not add to totals shown.
2/ Includes flotation concentrate.
3/ Data excludes run-of-mine.

### TABLE 3
CRUSHED AND GROUND BARITE SOLD OR USED BY PROCESSORS IN THE UNITED STATES, BY STATE 1/ 2/

<table>
<thead>
<tr>
<th>State</th>
<th>Number of plants</th>
<th>1994</th>
<th>1995</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of plants</td>
<td>Quantity (thousand metric tons)</td>
<td>Value (thousands)</td>
</tr>
<tr>
<td>Louisiana</td>
<td>5</td>
<td>676</td>
<td>$51,700</td>
</tr>
<tr>
<td>Nevada</td>
<td>4</td>
<td>308</td>
<td>7,220</td>
</tr>
<tr>
<td>Other States 3/</td>
<td>10</td>
<td>266</td>
<td>22,200</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>1,250</td>
<td>81,100</td>
</tr>
</tbody>
</table>

W/ Withheld to avoid disclosing company proprietary data; included with "Total."
1/ Data are rounded to three significant digits; may not add to totals shown.
2/ Includes imports.
### TABLE 4
CRUSHED AND GROUND BARITE SOLD OR USED BY PROCESSORS IN THE UNITED STATES, BY USE 1/ 2/

(Thousand metric tons and thousand dollars)

<table>
<thead>
<tr>
<th>Use</th>
<th>1994 Quantity</th>
<th>Value (Thousands)</th>
<th>1995 Quantity</th>
<th>Value (Thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barium chemicals, filler and/or extender, glass</td>
<td>130</td>
<td>$18,700</td>
<td>105</td>
<td>$17,500</td>
</tr>
<tr>
<td>Well drilling</td>
<td>1,120</td>
<td>62,400</td>
<td>1,110</td>
<td>65,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,250</strong></td>
<td><strong>81,100</strong></td>
<td><strong>1,210</strong></td>
<td><strong>82,500</strong></td>
</tr>
</tbody>
</table>

1/ Data are rounded to three significant digits; may not add to totals shown.
2/ Includes imports.

### TABLE 5
U.S. EXPORTS OF NATURAL BARIUM SULFATE (BARITE), BY COUNTRY 1/

<table>
<thead>
<tr>
<th>Country</th>
<th>1994 Quantity (metric tons)</th>
<th>Value (Thousands)</th>
<th>1995 Quantity (metric tons)</th>
<th>Value (Thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>19</td>
<td>$3</td>
<td>26</td>
<td>$42</td>
</tr>
<tr>
<td>Barbados</td>
<td>90</td>
<td>48</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Brazil</td>
<td>--</td>
<td>--</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Canada</td>
<td>11,700</td>
<td>$1,120</td>
<td>14,000</td>
<td>1,140</td>
</tr>
<tr>
<td>Colombia</td>
<td>3</td>
<td>3</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>23</td>
<td>9</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>France</td>
<td>--</td>
<td>--</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Greece</td>
<td>--</td>
<td>--</td>
<td>40</td>
<td>9</td>
</tr>
<tr>
<td>Israel</td>
<td>--</td>
<td>--</td>
<td>10</td>
<td>56</td>
</tr>
<tr>
<td>Italy</td>
<td>28</td>
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<td>--</td>
</tr>
<tr>
<td>Japan</td>
<td>43</td>
<td>207</td>
<td>18</td>
<td>293</td>
</tr>
<tr>
<td>Jordan</td>
<td>7</td>
<td>5</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Korea, Republic of</td>
<td>36</td>
<td>15</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Mexico</td>
<td>1,870</td>
<td>408</td>
<td>1,430</td>
<td>428</td>
</tr>
<tr>
<td>Spain</td>
<td>--</td>
<td>--</td>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td>Suriname</td>
<td>--</td>
<td>--</td>
<td>36</td>
<td>6</td>
</tr>
<tr>
<td>Switzerland</td>
<td>--</td>
<td>--</td>
<td>7</td>
<td>12</td>
</tr>
<tr>
<td>Taiwan</td>
<td>--</td>
<td>--</td>
<td>19</td>
<td>7</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>19</td>
<td>19</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>13,800</strong></td>
<td><strong>1,850</strong></td>
<td><strong>15,600</strong></td>
<td><strong>2,020</strong></td>
</tr>
</tbody>
</table>

1/ Data are rounded to three significant digits; may not add to totals shown.

Source: Bureau of the Census.

### TABLE 6
U.S. IMPORTS FOR CONSUMPTION OF BARITE, BY COUNTRY 1/

<table>
<thead>
<tr>
<th>Country</th>
<th>1994 Quantity (metric tons)</th>
<th>Value (Thousands)</th>
<th>1995 Quantity (metric tons)</th>
<th>Value (Thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude barite:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>321</td>
<td>$67</td>
<td>87</td>
<td>$27</td>
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<tr>
<td>China</td>
<td>788,000</td>
<td>33,000</td>
<td>699,000</td>
<td>33,900</td>
</tr>
<tr>
<td>India</td>
<td>198,000</td>
<td>5,980</td>
<td>216,000</td>
<td>7,760</td>
</tr>
<tr>
<td>Mexico</td>
<td>2,390</td>
<td>217</td>
<td>10,700</td>
<td>474</td>
</tr>
<tr>
<td>Morocco</td>
<td>26,300</td>
<td>1,110</td>
<td>38,400</td>
<td>1,890</td>
</tr>
<tr>
<td>Netherlands</td>
<td>--</td>
<td>--</td>
<td>25</td>
<td>15</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>--</td>
<td>--</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,020,000</strong></td>
<td><strong>40,400</strong></td>
<td><strong>965,000</strong></td>
<td><strong>44,100</strong></td>
</tr>
<tr>
<td>Ground barite:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>11,600</td>
<td>2,730</td>
<td>11,600</td>
<td>2,850</td>
</tr>
<tr>
<td>Denmark</td>
<td>7</td>
<td>4</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Germany</td>
<td>180</td>
<td>92</td>
<td>231</td>
<td>124</td>
</tr>
<tr>
<td>Japan</td>
<td>106</td>
<td>60</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>Mexico</td>
<td>46,600</td>
<td>3,920</td>
<td>66,400</td>
<td>5,360</td>
</tr>
<tr>
<td>Netherlands</td>
<td>2</td>
<td>3</td>
<td>49</td>
<td>25</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>58,500</strong></td>
<td><strong>6,810</strong></td>
<td><strong>78,400</strong></td>
<td><strong>8,430</strong></td>
</tr>
</tbody>
</table>

1/ Data are rounded to three significant digits; may not add to totals shown.
2/ C.i.f. value.

Source: Bureau of the Census.
## TABLE 7
U.S. IMPORTS FOR CONSUMPTION OF BARIUM CHEMICALS 1/

<table>
<thead>
<tr>
<th>Year</th>
<th>Barium chloride</th>
<th>Barium oxide, hydroxide, and peroxide</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quantity (metric tons)</td>
<td>Value 2/ (thousands)</td>
</tr>
<tr>
<td>1994</td>
<td>510</td>
<td>$264</td>
</tr>
<tr>
<td>1995</td>
<td>1,110</td>
<td>651</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Barium nitrate</th>
<th>Barium carbonate, precipitated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quantity (metric tons)</td>
<td>Value 2/ (thousands)</td>
</tr>
<tr>
<td>1994</td>
<td>2,800</td>
<td>2,510</td>
</tr>
<tr>
<td>1995</td>
<td>3,950</td>
<td>3,450</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Other barium compounds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quantity (metric tons)</td>
</tr>
<tr>
<td>1994</td>
<td>13,000</td>
</tr>
<tr>
<td>1995</td>
<td>13,400</td>
</tr>
</tbody>
</table>

1/ Data are rounded to three significant digits.
2/ C.i.f. value.

Source: Bureau of the Census.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Algeria</td>
<td>44,361</td>
<td>51,159</td>
<td>47,232</td>
<td>20,590</td>
<td>25,000</td>
</tr>
<tr>
<td>Argentina</td>
<td>23,896</td>
<td>10,015</td>
<td>11,267</td>
<td>11,500</td>
<td>11,000</td>
</tr>
<tr>
<td>Australia</td>
<td>11,000</td>
<td>11,000</td>
<td>11,000</td>
<td>11,000</td>
<td>11,000</td>
</tr>
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<td>Bolivia</td>
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<td><strong>Total</strong></td>
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<td>4,470,000</td>
<td>4,140,000</td>
<td>4,210,000</td>
<td>4,410,000</td>
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* e/ Estimated.  r/ Revised.  XX Not applicable.
1/ World totals, U.S. data, and estimated data are rounded to three significant digits; may not add to totals shown.
2/ Table includes data available through July 12, 1996.
3/ In addition to the countries listed, Bulgaria also produces barite, but available information is inadequate to make reliable estimates of output levels.
4/ Data are for fiscal year beginning Mar. 21 of that stated.
5/ All production in Yugoslavia for 1991 came from Bosnia and Herzegovina.
6/ Barite concentrates.
7/ Reported figure.
10/ Sold or used by producers.
11/ Data excludes run-of-mine.