

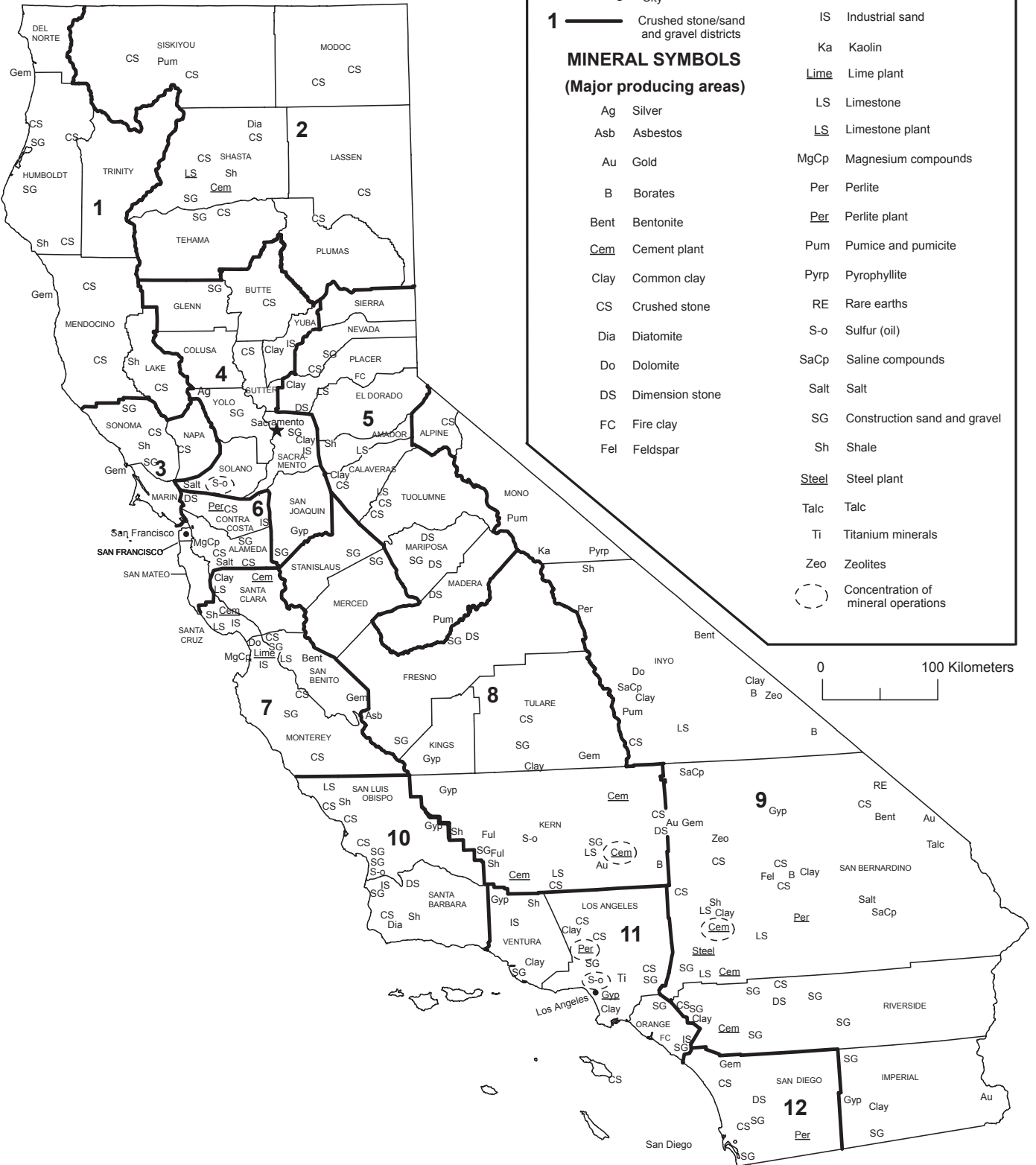
# CALIFORNIA

## LEGEND

- County boundary
- ★ Capital
- City
- 1** — Crushed stone/sand and gravel districts

## MINERAL SYMBOLS (Major producing areas)

- |            |                 |              |                                     |
|------------|-----------------|--------------|-------------------------------------|
| Ag         | Silver          | Ful          | Fuller's earth                      |
| Asb        | Asbestos        | Gem          | Gemstones                           |
| Au         | Gold            | Gyp          | Gypsum                              |
| B          | Borates         | <u>Gyp</u>   | Gypsum plant                        |
| Bent       | Bentonite       | IS           | Industrial sand                     |
| <u>Cem</u> | Cement plant    | Ka           | Kaolin                              |
| Clay       | Common clay     | <u>Lime</u>  | Lime plant                          |
| CS         | Crushed stone   | LS           | Limestone                           |
| Dia        | Diatomite       | <u>LS</u>    | Limestone plant                     |
| Do         | Dolomite        | MgCp         | Magnesium compounds                 |
| DS         | Dimension stone | Per          | Perlite                             |
| FC         | Fire clay       | <u>Per</u>   | Perlite plant                       |
| Fel        | Feldspar        | Pum          | Pumice and pumicite                 |
|            |                 | Pyrp         | Pyrophyllite                        |
|            |                 | RE           | Rare earths                         |
|            |                 | S-o          | Sulfur (oil)                        |
|            |                 | SaCp         | Saline compounds                    |
|            |                 | Salt         | Salt                                |
|            |                 | SG           | Construction sand and gravel        |
|            |                 | Sh           | Shale                               |
|            |                 | <u>Steel</u> | Steel plant                         |
|            |                 | Talc         | Talc                                |
|            |                 | Ti           | Titanium minerals                   |
|            |                 | Zeo          | Zeolites                            |
|            |                 | (---)        | Concentration of mineral operations |



Source: California Department of Conservation, California Geological Survey/U.S. Geological Survey (2004)

# THE MINERAL INDUSTRY OF CALIFORNIA

This chapter has been prepared under a Memorandum of Understanding between the U.S. Geological Survey and the California Geological Survey for collecting information on all nonfuel minerals.

In 2004, California's nonfuel raw mineral production was valued<sup>1</sup> at \$3.76 billion, based upon annual U.S. Geological Survey (USGS) data. This was an increase of nearly 10% from that of 2003<sup>2</sup> and followed a 0.6% increase from 2002 to 2003. For the sixth consecutive year, the State led the Nation in nonfuel mineral production value, of which California accounted for more than 8% of the U.S. total.

Industrial minerals accounted for nearly 99% of California's nonfuel mineral value; the remaining value resulted from the mining of gold, silver, and iron ore (descending order of value). In 2004, California continued as the leading construction-sand-and-gravel-producing State, accounting for more than 13% of the commodity's total U.S. mine production and nearly 19.5% of the Nation's total value for that mineral commodity. Construction sand and gravel was, by value, also the State's leading nonfuel mineral, accounting for approximately 34% of the State's total nonfuel mineral production value. Cement (portland and masonry) was the second leading nonfuel mineral, followed by boron minerals, crushed stone, diatomite, and soda ash; these six accounted for nearly 94% of the State's total industrial mineral value (table 1).

In 2004, increases in the production and values of construction sand and gravel, value up \$130 million, portland cement, up \$113 million, boron, up \$35 million, and masonry cement led California's increase in nonfuel mineral production value for the year. Substantial increases also took place in diatomite and soda ash, the values of which were up more than \$8 million each, industrial sand and gravel, up nearly \$6 million, and salt, up about \$5 million. The largest decreases in value were those of gold, down about \$7 million, crushed stone, down \$6 million, and kaolin, down less than \$3 million. All other changes in value, nearly all increases, were less than \$1 million (table 1).

In 2003, the mineral commodities having the most substantial increases in value were those of boron minerals, up \$78 million, construction sand and gravel, up by \$40 million, portland cement, up by \$34 million, and fuller's earth, up by more than \$11 million. Additionally, industrial sand and gravel and gypsum were up by more than \$2 million each. The largest decreases were those of crushed stone, down by \$52 million, gold, down by nearly \$42 million, masonry cement, down more than \$8 million, and soda ash, down about \$5 million. Also down were the values of salt, common clays, and pumice, down \$3 million, about \$2 million, and \$1 million, respectively. All other changes were of less than \$1 million, having comparatively little effect on the change in overall total value (table 1).

California continued to be the Nation's only State to produce boron in 2004 and remained first in the production of construction sand and gravel and of portland cement (descending order of value). The State continued to be second among three States that produced soda ash, was second in masonry cement; third in feldspar; fourth in gemstones (based upon value); fifth in industrial sand and gravel and magnesium compounds; and sixth in common clays. While California rose to 1st from 2d in the production of diatomite and to 5th from 6th in gold, it decreased to 5th from 4th in pumice and pumicite and in crude gypsum, to 7th from 6th in fuller's earth, and to 13th from 10th in crushed stone. Additionally, California was a significant producer of salt and dimension stone.

The following narrative information was provided by the California Geological Survey (CGS).<sup>3</sup>

There were about 1,156 active mines producing nonfuel minerals in the State. Approximately 11,000 people were employed at these mines and their processing plants.

## Commodity Review

### *Industrial Minerals*

**Cement.**—In September 2004, CEMEX, the world's third leading cement producer, announced its plans to acquire RMC Pacific Materials Inc. The proposed \$5.8 billion acquisition, expected to be completed in early 2005, would make CEMEX the world's leading concrete supplier. RMC Pacific Materials Inc., the current largest supplier of ready-mixed concrete, operated 9 aggregate mines, 55 ready-mix facilities, and 4 cement facilities in the San Francisco Bay, Monterey Bay, and Central California regions. Iron ore mined in California was used in the production of portland cement and was considered an industrial mineral.

**Crushed Stone and Sand and Gravel.**—Vulcan Materials Company/Western Division's Boulevard Plant (Los Angeles County) continued to lead the State and the Nation in sand and gravel production.

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<sup>1</sup>The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending upon the mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 2004 USGS mineral production data published in this chapter are those available as of December 2005. All USGS Mineral Industry Surveys and USGS Minerals Yearbook chapters—mineral commodity, State, and country—also can be retrieved over the Internet at URL <http://minerals.usgs.gov/minerals>.

<sup>2</sup>Values, percentage calculations, and rankings for 2003 may differ from the Minerals Yearbook, Area Reports: Domestic 2003, Volume II, owing to the revision of preliminary 2003 to final 2003 data. Data and rankings for 2004 are considered to be final and are not likely to change significantly.

<sup>3</sup>Susan Kohler, Senior Engineering Geologist, authored the text of information submitted by the California Geological Survey.

Importation of stone and sand and gravel by ship and barge from Canada and Mexico to California ports continued to take place in the San Francisco and San Diego bay areas. California imported about 1.8 million metric tons (Mt) of sand and gravel during 2004.

After 10 years of negotiations, the United Rock Products Corp. and the city of Irwindale (Los Angeles County) agreed to a settlement in August that will allow deepening of two of the company's existing pits down to 125 meters (m) and 134 m. The increased mining depth will allow United Rock to mine an additional 36 Mt of aggregate (stone and sand and gravel) that will supply the San Gabriel Valley area. The settlement also required United Rock to pay the city of Irwindale about \$4 million in back mining taxes.

Kiewit Pacific Co. acquired a permit in September to mine about 3.6 Mt of crushed rock in the Newberry Springs Area (San Bernardino County). The mine site will also include an asphalt plant. Kiewit planned to use the asphalt and rock for its own construction projects such as the Caltrans rehabilitation of Interstate 15 between Barstow and Rasor Road.

Rhodes and Jamieson LLC submitted a draft plan to the Alameda County Planning Commission in December to mine 86 hectares (ha) of alluvial sand and gravel in the Pleasanton Area. If approved, the proposed project would provide approximately 45 Mt of construction-grade sand and gravel to the South San Francisco Bay Region.

Santa Fe Aggregates Inc. received county approval in March to mine a 14-ha site along the Tuolumne River (Stanislaus County) containing 4.4 Mt of alluvial sand and gravel. The project was in litigation. The company also received approval in January to mine a 170-ha expansion area of its Winton mining operation located along the Merced River (Merced County). The expansion will add 23.1 Mt of alluvial sand and gravel reserves to the Merced area.

Eleven years after the initial approval of the project, a ruling made in November by the Court of Appeal in San Francisco allows Mission Valley Rock Co. to mine 39 Mt of construction-grade sand and gravel from a 56-ha site in the city of Sunol (Alameda County). Mission Valley Rock planned to start producing sand and gravel from the site in 2007 to 2008.

Vulcan submitted an application to Alameda County in the fall of 2004 to mine 146 ha of land adjacent to its current operation in Pleasanton.

Kaweah River Rock Co. continued the permitting process to mine 113 ha of land south of its existing operation. If approved, the permit will add an additional 14 to 18 Mt of reserves to the northern Tulare County area. A final decision by the County Board of Supervisors was expected in spring of 2005.

RMC Pacific Materials Inc. continued its permitting process to mine 200 Mt of crushed stone at Jessie Morrow Mountain (Fresno County) near the town of Friant.

CEMEX's controversial proposed 186-ha, 71-Mt Soledad Canyon sand and gravel mining project (Los Angeles County) was approved by the County Board of Supervisors in June 2004. The project was denied by the board and has been in litigation since 2002.

**Rare Earths.**—Molycorp Inc.'s plan and subsequent permit was approved in July 2004 to enlarge the current pit and construct a new onsite tailings impoundment and evaporation pond for its Mountain Pass rare-earths mine (San Bernardino County). The approval will allow the existing pit to be mined down to 230 m below ground surface (an additional 76 m) and will increase mine life by 30 years. The Mountain Pass Mine has been shut down since 1998 when Molycorp Inc. was cited for spilling low-level radioactive waste from a broken pipeline. Until its closure, Molycorp was the only producer of rare earths in the United States. Unocal Corporation (Molycorp's parent company) was acquired by Chevron Corporation in August 2005, after a failed takeover attempt by the Chinese oil company, China National Offshore Oil Corporation.

Mitsubishi Cement Corp. received its permit for an 81-ha expansion of its Cushenbury Limestone Mine (San Bernardino County) in October 2004. The expansion will add at least 45 Mt of cement-grade limestone reserves to the existing mine.

## **Metals**

**Gold.**—Despite the increase in gold prices, California's production continued to decline drastically. In 2004, production amounted to 2,800 kilograms (kg) per year, down 37% from that of 2003. Total value amounted to about \$36.3 million, down about 29% from last year's value of \$51.3 million. In the past 5 years (since 1999) California's gold production has decreased by almost 85%, while the Nation's gold production has decreased 28%.

California had only four major producing gold mines in 2004. Mining was no longer taking place at these four properties, but gold processing continued from heap leaching. These included Glamis Rand Mining Company's Rand Mine (Kern County), Canyon Resources Corporation's Briggs Mine (Inyo County), Western Goldfields Inc.'s Mesquite Mine (Imperial County), and Quest Capital Corporation's and MK Resources Company's Castle Mountain Mine joint venture (San Bernardino County).

The Briggs Mine led the State in gold production. Mining operations ceased in April 2004, but ore processing continued from heap leaching to produce a total of 920 kg of gold for the year. Leaching of the 21.3 Mt of ore on the pad will probably be completed by yearend 2005. During the mine's 8-year life span up through 2004, the Briggs Mine has produced 16,900 kg of gold and 4,741 kg of silver. Gold production was expected to continue into 2006.

California's second leading gold producer for the year was Western Goldfields Inc.'s Mesquite Mine, acquired from Newmont Mining Corp. in November 2003. Mining operations ceased in May 2001, but Western Goldfields Inc. has announced plans to restart open pit mining operations late in 2006 in an expanded portion of the mine that was permitted in spring 2002. The company also considered retreating the existing heaps for additional gold recovery. The new expanded area was thought to contain almost 45 Mt of gold ore averaging 0.72 gram per metric ton containing about 31,000 kg of recoverable gold.

The Rand Mine had ceased mining operations in January 2003, and the mining equipment was moved to the company's Marigold Mine in Nevada. Glamis has operated the Rand Mine since 1984. Upon completion of the heap leaching, expected in 2005, the mine will have recovered nearly 31,000 kg of gold during its 15-year life. Glamis had no plans to reopen the mine.

Ore recovery continued at the Castle Mountain Mine through 2004 and will continue into 2005. Mining ceased in 2001. The mine was currently undergoing reclamation activities.

In addition to the above-mentioned mines, gold was produced as a secondary mineral at numerous alluvial sand and gravel mines mainly in the northern and central part of the State. California also had several small underground gold mines that mainly produced specimen gold.

**Silver.**—Silver production made up less than 1% of California's total metal production. All of the silver produced in California was a byproduct of gold production.

### **Mine Reclamation**

The CGS Mineral Land Classification Project, a mandate of the Surface Mining and Reclamation Act, continued to provide lead agencies with mineral resource maps that have proved to be of great value in land-use planning and mineral resource conservation. To date, CGS has classified a little more than one-third of the State for mineral resources. In 2004, CGS completed a comprehensive aggregate resource study for Sonoma County (CGS Special Report 175). The report included an aggregate resource classification map of the county at 1:125,000 scale, an evaluation of permitted and nonpermitted aggregate resources including quantity estimates, a 50-year aggregate demand projection, and an evaluation of potential alternative resources. CGS also had ongoing aggregate classification projects in the San Bernardino and Palm Springs area (San Bernardino County) and the Claremont-Upland area (Los Angeles County). CGS staff was conducting a statewide constituent survey to determine the most critical areas in the State that are in need of Mineral Land Classification.

TABLE 1  
NONFUEL RAW MINERAL PRODUCTION IN CALIFORNIA<sup>1,2</sup>

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral	2002		2003		2004		
	Quantity	Value	Quantity	Value	Quantity	Value	
Asbestos	metric tons	2,770	1,380	--	--	--	--
Boron minerals		1,050	513,000	1,150	591,000	1,210	626,000
Cement, portland		11,200	853,000 <sup>e</sup>	11,600	887,000 <sup>e</sup>	11,900	1,000,000 <sup>e</sup>
Clays:							
Bentonite		26	2,830	23	2,560	24	2,640
Common		1,030	21,400	1,240	19,100	1,230	20,700
Fuller's earth		W	W	W	W	197	W
Gemstones		NA	1,040	NA	1,080	NA	1,070
Gold <sup>3</sup>	kilograms	9,180	91,900	4,270	50,100	3,260	43,000
Sand and gravel:							
Construction		151,000	1,110,000	152,000	1,150,000	166,000	1,280,000
Industrial		1,800	48,000	1,790	50,100	1,990	55,700
Silver <sup>3</sup>	kilograms	3,400	506	957	151	801	172
Stone:							
Crushed		67,400	423,000	55,500	371,000	55,400	365,000
Dimension		41	9,870	40	9,920	42	10,200
Combined values of cement (masonry), clays [fire (2002), kaolin], diatomite, feldspar, gypsum (crude), iron ore (usable), lime, magnesium compounds, perlite (crude), pumice and pumicite, pyrophyllite [crude (2003)], rare-earth metal concentrates (2002), salt, soda ash, talc (crude), zeolites (2004), and values indicated by symbol W		XX	340,000 <sup>r</sup>	XX	308,000	XX	349,000
Total		XX	3,410,000 <sup>r</sup>	XX	3,440,000	XX	3,760,000

<sup>e</sup>Estimated. <sup>r</sup>Revised. NA Not available. W Withheld to avoid disclosing company proprietary data. Withheld values included in "Combined values" data. XX Not applicable. -- Zero.

<sup>1</sup>Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

<sup>2</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>3</sup>Recoverable content of ores, etc.

TABLE 2  
CALIFORNIA: CRUSHED STONE SOLD OR USED, BY KIND<sup>1</sup>

Kind	2002				2003				2004			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone <sup>2</sup>	31 <sup>r</sup>	35,400	\$176,000	\$4.97	26	27,500	\$136,000	\$4.94	29	26,300	\$124,000	\$4.71
Dolomite	5	316	2,390	7.55 <sup>r</sup>	5	250	1,570	6.30	6	895	4,930	5.50
Marble	2	W	W	8.52	2	W	W	4.71	2	W	W	7.28
Shell	1	W	W	8.18	1	W	W	8.54	1	W	W	8.18
Granite	21 <sup>r</sup>	12,800	94,700	7.40	21	11,000	87,300	7.92	23	11,400	91,100	7.99
Traprock	26 <sup>r</sup>	10,900 <sup>r</sup>	80,000 <sup>r</sup>	7.34 <sup>r</sup>	29	10,000	82,900	8.25	34	11,800	102,000	8.70
Sandstone and quartzite	14 <sup>r</sup>	3,830 <sup>r</sup>	38,500 <sup>r</sup>	10.07 <sup>r</sup>	15	2,140	25,000	11.67	13	1,650	15,900	9.66
Slate	2	W	W	18.80	3	72	1,460	20.18	4	308	3,330	10.81
Volcanic cinder and scoria	8	192	1,690	8.77	8	175	1,640	9.37	8	172	1,970	11.42
Miscellaneous stone	26 <sup>r</sup>	3,760 <sup>r</sup>	27,800 <sup>r</sup>	7.40 <sup>r</sup>	26	4,280	35,500	8.28	29	2,880	22,000	7.65
Total or average	XX	67,400	423,000	6.28	XX	55,500	371,000	6.69	XX	55,400	365,000	6.60

<sup>r</sup>Revised. W Withheld to avoid disclosing company proprietary data; included in "Total or average." XX Not applicable.

<sup>1</sup>Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.

<sup>2</sup>Includes limestone-dolomite reported with no distinction between the two.

TABLE 3a  
CALIFORNIA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2003, BY USE<sup>1</sup>

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
<b>Construction:</b>			
<b>Coarse aggregate (+1½ inch):</b>			
Macadam	W	W	\$7.50
Riprap and jetty stone	2,300	\$26,100	11.37
Filter stone	259	2,210	8.54
Other coarse aggregates	493	3,590	7.28
Total or average	3,050	31,900	10.47
<b>Coarse aggregate, graded:</b>			
Concrete aggregate, coarse	1,400	13,100	9.34
Bituminous aggregate, coarse	487	6,340	13.01
Bituminous surface-treatment aggregate	(2)	(2)	7.99
Railroad ballast	483	5,110	10.59
Other graded coarse aggregates	2,860	31,400	11.00
Total or average	5,230	56,000	10.71
<b>Fine aggregate (-¾ inch):</b>			
Stone sand, concrete	195	1,310	6.73
Stone sand, bituminous mix or seal	479	9,030	18.85
Screening, undesignated	558	5,660	10.14
Other fine aggregates	604	9,200	15.24
Total or average	1,840	25,200	13.73
<b>Coarse and fine aggregates:</b>			
Graded road base or subbase	5,290	37,700	7.12
Unpaved road surfacing	250	2,680	10.72
Terrazzo and exposed aggregate	30	470	15.67
Crusher run or fill or waste	1,220	4,100	3.36
Other coarse and fine aggregates	1,540	13,300	8.65
Total or average	8,330	58,300	6.99
Other construction materials	566	6,520	11.53
<b>Agricultural:</b>			
Limestone	(3)	(3)	15.42
Poultry grit and mineral food	(3)	(3)	20.58
Other agricultural uses	174	3,330	19.12
Total or average	174	3,330	19.12
<b>Chemical and metallurgical:</b>			
Cement manufacture	12,000	49,500	4.11
Chemical stone for alkali works	(4)	(4)	6.62
Sulfur oxide removal	(4)	(4)	22.58
Total or average	12,100	49,800	4.12
Special, asphalt fillers or extenders	(5)	(5)	22.04
<b>Other miscellaneous uses:</b>			
Flour (slate)	(6)	(6)	50.71
Other specified uses not listed	258	2,960	11.47
Total or average	258	2,960	11.47
<b>Unspecified:<sup>7</sup></b>			
Reported	9,720	60,600	6.23
Estimated	14,000	77,000	5.38
Total or average	24,000	137,000	5.73
Grand total or average	55,500	371,000	6.69

W Withheld to avoid disclosing company proprietary data; included with "Other coarse aggregates."

<sup>1</sup>Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.

<sup>2</sup>Withheld to avoid disclosing company proprietary data; included with "Other graded coarse aggregates."

<sup>3</sup>Withheld to avoid disclosing company proprietary data; included with "Other agricultural uses."

<sup>4</sup>Withheld to avoid disclosing company proprietary data; included in "Total or average."

<sup>5</sup>Withheld to avoid disclosing company proprietary data; included in "Unspecified: Reported."

<sup>6</sup>Withheld to avoid disclosing company proprietary data; included with "Other specified uses not listed."

<sup>7</sup>Reported and estimated production without a breakdown by end use.

TABLE 3b

CALIFORNIA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2004, BY USE<sup>1</sup>

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
<b>Construction:</b>			
<b>Coarse aggregate (+1½ inch):</b>			
Riprap and jetty stone	769	\$10,500	\$13.70
Filter stone	408	3,050	7.47
Other coarse aggregates	1,580	12,000	7.60
Total or average	2,760	25,600	9.28
<b>Coarse aggregate, graded:</b>			
Concrete aggregate, coarse	1,180	11,300	9.59
Bituminous aggregate, coarse	1,620	16,300	10.05
Bituminous surface-treatment aggregate	W	W	8.69
Railroad ballast	437	5,130	11.73
Other graded coarse aggregates	824	5,820	7.06
Total or average	4,070	38,600	9.49
<b>Fine aggregate (-¾ inch):</b>			
Stone sand, concrete	55	341	6.20
Stone sand, bituminous mix or seal	291	2,600	8.93
Screening, undesignated	1,180	10,400	8.80
Other fine aggregates	219	2,440	11.12
Total or average	1,740	15,700	9.03
<b>Coarse and fine aggregates:</b>			
Graded road base or subbase	4,020	31,000	7.71
Unpaved road surfacing	326	2,370	7.27
Terrazzo and exposed aggregate	46	818	17.78
Crusher run or fill or waste	314	1,230	3.91
Other coarse and fine aggregates	2,340	19,900	8.54
Total or average	7,040	55,400	7.86
Other construction materials <sup>2</sup>	51	542	10.63
<b>Agricultural:</b>			
Limestone	70	746	10.66
Poultry grit and mineral food	119	2,130	17.86
Other agricultural uses	1	9	9.00
Total or average	190	2,880	15.16
<b>Chemical and metallurgical:</b>			
Cement manufacture	7,190	26,600	3.70
Sulfur oxide removal	(3)	(3)	22.05
Glass manufacture	(3)	(3)	6.61
Total or average	7,210	26,700	3.71
<b>Special:</b>			
Asphalt fillers or extenders	(3)	(3)	7.29
Whiting or whiting substitute	(3)	(3)	6.34
Total or average	89	640	7.19
<b>Other miscellaneous uses:</b>			
Flour (slate)	(4)	(4)	50.71
Other specified uses not listed	1,500	8,900	5.94
Total or average	1,500	8,900	5.94
<b>Unspecified:<sup>5</sup></b>			
Reported	14,900	103,000	6.90
Estimated	16,000	88,000	5.53
Total or average	30,700	190,000	6.20
Grand total or average	55,400	365,000	6.60

W Withheld to avoid disclosing company proprietary data; included with "Other graded coarse aggregates."

<sup>1</sup>Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.

<sup>2</sup>Includes drain fields.

<sup>3</sup>Withheld to avoid disclosing company proprietary data; included in "Total or average."

<sup>4</sup>Withheld to avoid disclosing company proprietary data; included in "Unspecified: Reported."

<sup>5</sup>Reported and estimated production without a breakdown by end use.



TABLE 4a  
CALIFORNIA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2003, BY USE AND DISTRICT<sup>1</sup>

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3		District 4		District 5	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
<b>Construction:</b>										
Coarse aggregate (+1½ inch) <sup>2</sup>	66	782	20	231	W	W	W	W	54	480
Coarse aggregate, graded <sup>3</sup>	--	--	W	W	W	W	W	W	W	W
Fine aggregate (-¾ inch) <sup>4</sup>	W	W	W	W	355	6,030	W	W	W	W
Coarse and fine aggregate <sup>5</sup>	308	2,460	336	2,950	1,110	8,230	W	W	378	2,590
Other construction materials	--	--	--	--	33	417	381	4,680	9	81
Agricultural <sup>6</sup>	--	--	W	W	--	--	--	--	--	--
Chemical and metallurgical <sup>7</sup>	W	W	W	W	--	--	--	--	--	--
Special <sup>8</sup>	--	--	--	--	(9)	(9)	--	--	--	--
Other miscellaneous uses <sup>10</sup>	14	62	--	--	--	--	--	--	23	1,160
<b>Unspecified:<sup>11</sup></b>										
Reported	206	1,410	26	152	478	5,470	656	4,020	153	1,000
Estimated	250	1,600	--	--	1,100	6,400	50	280	890	5,300
Total	873	6,600	1,520	9,720	3,240	30,400	3,510	31,100	1,560	11,200
Use	District 6		District 7		District 8		District 9		District 10	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
<b>Construction:</b>										
Coarse aggregate (+1½ inch) <sup>2</sup>	W	W	26	368	W	W	603	5,040	W	W
Coarse aggregate, graded <sup>3</sup>	420	6,530	2,190	25,400	W	W	1,060	9,110	--	--
Fine aggregate (-¾ inch) <sup>4</sup>	318	5,630	558	8,530	W	W	101	594	W	W
Coarse and fine aggregate <sup>5</sup>	1,380	10,500	1,890	11,800	W	W	W	W	W	W
Other construction materials	2	26	21	69	--	--	102	1,090	19	164
Agricultural <sup>6</sup>	W	W	W	W	--	--	W	W	W	W
Chemical and metallurgical <sup>7</sup>	--	--	W	W	W	W	7,080	26,900	W	W
Special <sup>8</sup>	--	--	--	--	--	--	--	--	(9)	(9)
Other miscellaneous uses <sup>10</sup>	--	--	--	--	17	74	204	1,660	--	--
<b>Unspecified:<sup>11</sup></b>										
Reported	620	3,760	3,870	21,500	215	1,400	1,810	11,000	520	3,300
Estimated	--	--	120	720	340	2,100	10,000	53,000	470	2,500
Total	2,760	26,700	9,770	75,400	3,860	16,700	22,100	113,000	1,230	9,600
Use	District 11		District 12		Unspecified districts					
	Quantity	Value	Quantity	Value	Quantity	Value				
<b>Construction:</b>										
Coarse aggregate (+1½ inch) <sup>2</sup>	W	W	W	W	--	--				
Coarse aggregate, graded <sup>3</sup>	W	W	W	W	--	--				
Fine aggregate (-¾ inch) <sup>4</sup>	W	W	W	W	--	--				
Coarse and fine aggregate <sup>5</sup>	W	W	W	W	--	--				
Other construction materials	--	--	--	--	--	--				
Agricultural <sup>6</sup>	--	--	--	--	--	--				
Chemical and metallurgical <sup>7</sup>	--	--	--	--	--	--				
Special <sup>8</sup>	--	--	--	--	--	--				
Other miscellaneous uses <sup>10</sup>	--	--	--	--	--	--				
<b>Unspecified:<sup>11</sup></b>										
Reported	862	5,040	346	2,480	8	52				
Estimated	470	2,700	310	1,800	--	--				
Total	3,800	31,900	1,250	8,900	8	52				

W Withheld to avoid disclosing company proprietary data; included in "Total." -- Zero.

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

<sup>2</sup>Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregates.

<sup>3</sup>Includes bituminous aggregate (coarse), bituminous surface-treatment aggregate, concrete aggregate (coarse), railroad ballast, and other graded coarse aggregates.

<sup>4</sup>Includes screening (undesignated), stone sand (concrete), stone sand bituminous mix or seal, and other fine aggregates.

<sup>5</sup>Includes crusher run (select material or fill), graded road base or subbase, terrazzo and exposed aggregate, unpaved road surfacing, and other coarse and fine aggregates.

<sup>6</sup>Includes agricultural limestone, poultry grit and mineral food, and other agricultural uses.

<sup>7</sup>Includes cement manufacture, chemical stone for alkali works, and sulfur oxide removal.

<sup>8</sup>Includes asphalt fillers or extenders.

<sup>9</sup>Withheld to avoid disclosing company proprietary data; included in "Unspecified: Reported."

<sup>10</sup>Includes flour (slate) and other specified uses not listed.

<sup>11</sup>Reported and estimated production without a breakdown by end use.

TABLE 4b  
CALIFORNIA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2004, BY USE AND DISTRICT<sup>1</sup>

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3		District 4		District 5	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction:										
Coarse aggregate (+1½ inch) <sup>2</sup>	W	W	79	1,110	318	3,620	54	952	W	W
Coarse aggregate, graded <sup>3</sup>	W	W	270	1,840	402	6,490	W	W	W	W
Fine aggregate (-¾ inch) <sup>4</sup>	W	W	65	412	109	893	W	W	W	W
Coarse and fine aggregate <sup>5</sup>	219	1,840	542	4,170	1,270	9,070	W	W	349	1,770
Other construction materials <sup>6</sup>	--	--	--	--	--	--	--	--	3	12
Agricultural <sup>7</sup>	--	--	W	W	--	--	--	--	--	--
Chemical and metallurgical <sup>8</sup>	W	W	W	W	--	--	--	--	--	--
Special <sup>9</sup>	--	--	--	--	--	--	--	--	--	--
Other miscellaneous uses <sup>10</sup>	2	10	--	--	--	--	--	--	(11)	(11)
Unspecified: <sup>12</sup>										
Reported	22	119	26	152	466	9,640	533	3,230	300	3,110
Estimated	170	1,500	--	--	1,100	7,200	200	1,600	1,000	6,600
Total	791	6,370	1,750	11,800	3,690	36,900	3,200	29,900	1,790	12,300
Use	District 6		District 7		District 8		District 9		District 10	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction:										
Coarse aggregate (+1½ inch) <sup>2</sup>	W	W	W	W	W	W	W	W	216	1,400
Coarse aggregate, graded <sup>3</sup>	W	W	W	W	W	W	1,760	13,900	--	--
Fine aggregate (-¾ inch) <sup>4</sup>	--	--	W	W	W	W	W	W	W	W
Coarse and fine aggregate <sup>5</sup>	941	8,200	181	902	W	W	735	4,310	W	W
Other construction materials <sup>6</sup>	--	--	46	504	--	--	--	--	--	--
Agricultural <sup>7</sup>	W	W	W	W	--	--	W	W	W	W
Chemical and metallurgical <sup>8</sup>	--	--	W	W	W	W	3,420	9,050	W	W
Special <sup>9</sup>	--	--	W	W	--	--	--	--	W	W
Other miscellaneous uses <sup>10</sup>	--	--	482	3,050	--	--	1,020	5,850	--	--
Unspecified: <sup>12</sup>										
Reported	420	2,570	5,430	45,600	48	300	6,130	28,300	280	1,920
Estimated	330	2,000	890	5,300	1,200	4,500	9,700	53,000	260	1,300
Total	2,170	18,500	9,250	71,000	3,620	16,000	23,100	117,000	930	7,410
Use	District 11		District 12		Unspecified districts					
	Quantity	Value	Quantity	Value	Quantity	Value				
Construction:										
Coarse aggregate (+1½ inch) <sup>2</sup>	W	W	--	--	--	--				
Coarse aggregate, graded <sup>3</sup>	W	W	--	--	--	--				
Fine aggregate (-¾ inch) <sup>4</sup>	--	--	W	W	--	--				
Coarse and fine aggregate <sup>5</sup>	W	W	W	W	--	--				
Other construction materials <sup>6</sup>	--	--	--	--	--	--				
Agricultural <sup>7</sup>	--	--	--	--	--	--				
Chemical and metallurgical <sup>8</sup>	--	--	--	--	--	--				
Special <sup>9</sup>	--	--	--	--	--	--				
Other miscellaneous uses <sup>10</sup>	--	--	--	--	--	--				
Unspecified: <sup>12</sup>										
Reported	862	5,040	359	2,730	34	223				
Estimated	460	2,700	370	2,200	--	--				
Total	2,390	18,400	2,690	19,500	34	223				

See footnotes at end of table.

TABLE 4 -- Continued  
CALIFORNIA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2004, BY USE AND DISTRICT<sup>1</sup>

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W Withheld to avoid disclosing company proprietary data; included in "Total." -- Zero.

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

<sup>2</sup>Includes filter stone, riprap and jetty stone, and other coarse aggregates.

<sup>3</sup>Includes bituminous aggregate (coarse), bituminous surface-treatment aggregate, concrete aggregate (coarse), railroad ballast, and other graded coarse aggregates.

<sup>4</sup>Includes screening (undesignated), stone sand (concrete), stone sand bituminous mix or seal, and other fine aggregates.

<sup>5</sup>Includes crusher run or fill or waste, graded road base or subbase, terrazzo and exposed aggregate, unpaved road surfacing, and other coarse and fine aggregates.

<sup>6</sup>Includes drain fields.

<sup>7</sup>Includes agricultural limestone, poultry grit and mineral food, and other agricultural uses.

<sup>8</sup>Includes cement and glass manufacture and sulfur oxide removal.

<sup>9</sup>Includes asphalt fillers or extenders and whiting or whiting substitute.

<sup>10</sup>Includes flour (slate) and other specified uses not listed.

<sup>11</sup>Withheld to avoid disclosing company proprietary data; included in "Unspecified: Reported."

<sup>12</sup>Reported and estimated production without a breakdown by end use.

TABLE 5a  
 CALIFORNIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2003,  
 BY MAJOR USE CATEGORY<sup>1</sup>

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	39,100	\$329,000	\$8.42
Plaster and gunitite sands	5,050	44,700	8.87
Concrete products (blocks, bricks, pipe, decorative, etc.)	1,890	16,500	8.71
Asphaltic concrete aggregates and other bituminous mixtures	17,300	146,000	8.41
Road base and coverings	15,200	115,000	7.59
Road and other stabilization (cement and lime)	323	2,890	8.95
Fill	9,830	65,900	6.70
Snow and ice control	49	340	6.88
Other miscellaneous uses <sup>2</sup>	453	5,560	12.27
Unspecified: <sup>3</sup>			
Reported	46,100	299,000	6.48
Estimated	17,000	120,000	7.30
Total or average	152,000	1,150,000	7.54

<sup>1</sup>Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.

<sup>2</sup>Includes railroad ballast.

<sup>3</sup>Reported and estimated production without a breakdown by end use.

TABLE 5b  
 CALIFORNIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2004,  
 BY MAJOR USE CATEGORY<sup>1</sup>

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	47,200	\$385,000	\$8.17
Plaster and gunitite sands	6,110	63,500	10.40
Concrete products (blocks, bricks, pipe, decorative, etc.)	1,220	10,600	8.71
Asphaltic concrete aggregates and other bituminous mixtures	18,200	160,000	8.75
Road base and coverings	15,000	115,000	7.66
Road and other stabilization (cement and lime)	624	6,530	10.46
Fill	6,820	29,400	4.31
Snow and ice control	72	521	7.27
Railroad ballast	28	142	4.99
Other miscellaneous uses <sup>2</sup>	885	13,900	15.70
Unspecified: <sup>3</sup>			
Reported	43,800	302,000	6.90
Estimated	26,000	200,000	7.62
Total or average	166,000	1,280,000	7.74

<sup>1</sup>Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.

<sup>2</sup>Includes filtration.

<sup>3</sup>Reported and estimated production without a breakdown by end use.

TABLE 6a  
CALIFORNIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2003, BY USE AND DISTRICT<sup>1</sup>

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate (including concrete sand)	817	9,770	730	6,080	W	W
Concrete products (blocks, bricks, pipe, decorative, etc.) <sup>2</sup>	W	W	W	W	W	W
Asphaltic concrete aggregates and other bituminous mixtures	W	W	447	3,240	W	W
Road base and coverings <sup>3</sup>	342	2,690	713	3,890	85	1,000
Fill	3	32	20	135	206	2,210
Other miscellaneous uses <sup>4</sup>	57	747	20	145	787	9,600
Unspecified: <sup>5</sup>						
Reported	232	1,380	387	3,180	14	113
Estimated	1,000	10,000	400	2,700	370	3,300
Total	2,450	24,600	2,720	19,400	1,460	16,200
Use	District 4		District 5		District 6	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate (including concrete sand)	7,680	59,900	417	3,190	2,150	26,700
Concrete products (blocks, bricks, pipe, decorative, etc.) <sup>2</sup>	4,830	43,800	W	W	--	--
Asphaltic concrete aggregates and other bituminous mixtures	4,710	39,300	W	W	1,070	12,200
Road base and coverings <sup>3</sup>	6,430	51,400	797	5,730	931	8,390
Fill	1,220	7,300	359	2,180	2,190	26,600
Other miscellaneous uses <sup>4</sup>	128	1,190	176	1,520	--	--
Unspecified: <sup>5</sup>						
Reported	6,700	50,200	160	1,280	1,310	11,600
Estimated	1,500	11,000	1,800	13,000	600	4,100
Total	33,200	264,000	3,710	26,900	8,250	89,600
Use	District 7		District 8		District 9	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate (including concrete sand)	1,270	11,500	6,220	49,900	4,450	28,700
Concrete products (blocks, bricks, pipe, decorative, etc.) <sup>2</sup>	W	W	155	1,660	1,320	9,250
Asphaltic concrete aggregates and other bituminous mixtures	W	W	1,820	16,700	4,450	26,400
Road base and coverings <sup>3</sup>	W	W	1,740	12,700	2,120	12,000
Fill	796	4,810	346	2,510	724	1,900
Other miscellaneous uses <sup>4</sup>	374	4,900	105	2,580	46	531
Unspecified: <sup>5</sup>						
Reported	793	5,280	2,990	21,000	19,100	120,000
Estimated	80	560	1,100	7,000	2,800	20,000
Total	3,310	27,100	14,500	114,000	35,000	219,000
Use	District 10		District 11		District 12	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate (including concrete sand)	W	W	11,800	95,500	2,200	24,400
Concrete products (blocks, bricks, pipe, decorative, etc.) <sup>2</sup>	82	847	360	3,410	W	W
Asphaltic concrete aggregates and other bituminous mixtures	W	W	W	W	W	W
Road base and coverings <sup>3</sup>	739	6,090	W	W	867	6,630
Fill	516	2,870	1,650	6,310	1,800	9,060
Other miscellaneous uses <sup>4</sup>	465	5,270	2,580	22,700	1,480	15,500
Unspecified: <sup>5</sup>						
Reported	2,150	14,000	6,900	41,000	4,060	25,800
Estimated	110	750	5,500	40,000	1,300	9,000
Total	4,900	37,600	29,300	214,000	11,700	90,400
Unspecified districts						
Use	Quantity	Value				
Concrete aggregate (including concrete sand)	--	--				
Concrete products (blocks, bricks, pipe, decorative, etc.) <sup>2</sup>	--	--				
Asphaltic concrete aggregates and other bituminous mixtures	--	--				
Road base and coverings <sup>3</sup>	--	--				
Fill	--	--				
Other miscellaneous uses <sup>4</sup>	--	--				
Unspecified: <sup>5</sup>						
Reported	1,350	3,960				
Estimated	--	--				
Total	1,350	3,960				

See footnotes at end of table.

TABLE 6b  
 CALIFORNIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2004, BY USE AND DISTRICT<sup>1</sup>

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate (including concrete sand)	56	453	464	3,840	W	W
Concrete products (blocks, bricks, pipe, decorative, etc.) <sup>2</sup>	W	W	W	W	--	--
Asphaltic concrete aggregates and other bituminous mixtures	W	W	404	4,290	W	W
Road base and coverings <sup>3</sup>	98	838	781	5,780	W	W
Fill	6	44	22	150	55	337
Other miscellaneous uses <sup>4</sup>	28	229	41	333	412	5,150
Unspecified: <sup>5</sup>						
Reported	243	1,540	18	165	561	5,910
Estimated	750	8,300	750	4,200	190	1,500
Total	1,180	11,400	2,480	18,800	1,220	12,900
Use	District 4		District 5		District 6	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate (including concrete sand)	7,470	60,800	302	2,450	W	W
Concrete products (blocks, bricks, pipe, decorative, etc.) <sup>2</sup>	3,470	34,400	W	W	--	--
Asphaltic concrete aggregates and other bituminous mixtures	5,780	53,600	W	W	W	W
Road base and coverings <sup>3</sup>	6,270	52,000	758	5,740	W	W
Fill	929	5,420	307	2,520	505	2,770
Other miscellaneous uses <sup>4</sup>	542	8,210	229	1,920	4,370	51,100
Unspecified: <sup>5</sup>						
Reported	9,880	75,500	18	131	2,170	17,500
Estimated	800	6,200	1,100	7,800	3,300	34,000
Total	35,100	296,000	2,690	20,500	10,300	106,000
Use	District 7		District 8		District 9	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate (including concrete sand)	663	6,460	6,170	53,200	13,500	91,200
Concrete products (blocks, bricks, pipe, decorative, etc.) <sup>2</sup>	W	W	190	2,300	2,090	19,700
Asphaltic concrete aggregates and other bituminous mixtures	--	--	2,470	21,300	4,780	36,000
Road base and coverings <sup>3</sup>	--	--	1,790	14,200	2,650	16,800
Fill	52	451	112	811	1,260	4,330
Other miscellaneous uses <sup>4</sup>	477	5,860	112	2,920	28	142
Unspecified: <sup>5</sup>						
Reported	347	2,280	1,220	7,970	15,700	106,000
Estimated	490	3,400	3,500	24,000	6,200	42,000
Total	2,030	18,500	15,600	127,000	46,300	316,000
Use	District 10		District 11		District 12	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate (including concrete sand)	W	W	13,300	103,000	2,610	29,400
Concrete products (blocks, bricks, pipe, decorative, etc.) <sup>2</sup>	W	W	1,050	10,400	W	W
Asphaltic concrete aggregates and other bituminous mixtures	--	--	2,640	20,600	W	W
Road base and coverings <sup>3</sup>	174	849	1,020	6,660	820	6,690
Fill	66	429	2,260	8,780	1,240	3,380
Other miscellaneous uses <sup>4</sup>	120	1,450	3	9	1,230	14,400
Unspecified: <sup>5</sup>						
Reported	6,810	46,800	5,470	34,600	81	640
Estimated	2,400	20,000	5,000	35,000	1,400	9,600
Total	9,600	69,600	30,700	220,000	7,350	64,200
Unspecified districts						
Use	Quantity		Value			
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate (including concrete sand)	--	--	--	--	--	--
Concrete products (blocks, bricks, pipe, decorative, etc.) <sup>2</sup>	--	--	--	--	--	--
Asphaltic concrete aggregates and other bituminous mixtures	--	--	--	--	--	--
Road base and coverings <sup>3</sup>	--	--	--	--	--	--
Fill	--	--	--	--	--	--
Other miscellaneous uses <sup>4</sup>	--	--	--	--	--	--
Unspecified: <sup>5</sup>						
Reported	1,270	3,280				
Estimated	--	--				
Total	1,270	3,280				

See footnotes at end of table.

TABLE 6

CALIFORNIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2004, BY USE AND DISTRICT<sup>1</sup>

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W Withheld to avoid disclosing company proprietary data; included in "Other miscellaneous uses." -- Zero.

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

<sup>2</sup>Includes plaster and gunite sands.

<sup>3</sup>Includes road and other stabilization (cement and lime).

<sup>4</sup>Includes filtration, railroad ballast, and snow and ice control.

<sup>5</sup>Reported and estimated production without a breakdown by end use.