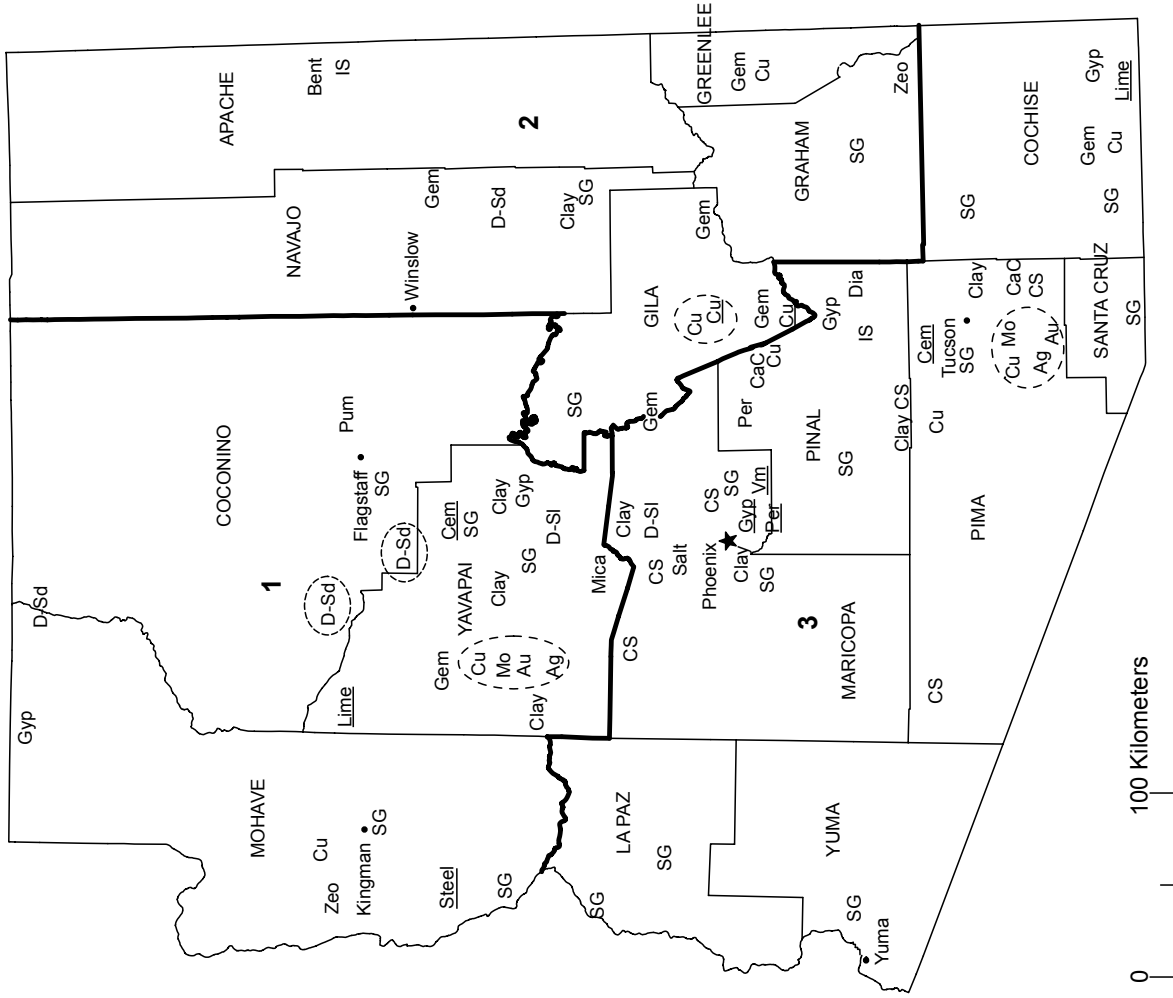


# ARIZONA



## LEGEND

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

## MINERAL SYMBOLS (Major producing areas)

- Ag Silver
- Au Gold
- Bent Bentonite
- CaC Calcium carbonate
- Clay Common clay
- CS Crushed stone
- Cu Copper
- Cu Copper plant
- D-Sd Dimension sandstone
- D-Si Dimension slate
- Dia Diatomite
- Gem Gemstones
- Gyp Gypsum
- Gyp Gypsum plant
- IS Industrial sand
- Lime Lime plant
- Mica Mica
- Mo Molybdenum
- Per Perlite
- Per Perlite plant
- Pum Pumice and pumicite
- Salt Salt
- SG Construction sand and gravel
- Steel Steel plant
- Vm Vermiculite plant
- Zeo Zeolites
- (---) Concentration of mineral operations

Source: Arizona Department of Mines and Mineral Resources/U.S. Geological Survey (2003)

# THE MINERAL INDUSTRY OF ARIZONA

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

In 2003, the estimated value<sup>1</sup> of nonfuel mineral production for Arizona was \$2.1 billion, based upon preliminary U.S. Geological Survey (USGS) data. This was an increase of about 8% compared with \$1.95 billion in 2002<sup>2</sup> and followed a 10.1% decrease during the period from 2001 to 2002. Arizona accounted for nearly 6% of the total nonfuel mineral production value in the United States and ranked third in 2003 among the 50 States for the fifth time in the past 6 years; the State had ranked fifth in 2002 and first from 1995 through 1997.

Arizona continued to be the Nation's leading copper-producing State in 2003 and accounted for nearly two-thirds of total U.S. copper mine production and value. Copper was the State's foremost nonfuel mineral produced and accounted for about 64% of Arizona's total nonfuel mineral production value, followed by construction sand and gravel, with about 15% of the State's total value, and portland cement, molybdenum (concentrates), crushed stone, and lime. While copper production decreased by about 3%, its value increased in 2003 by more than 5% because of higher average copper prices. Molybdenum production and value rose by more than 15% and by approximately \$55 million, respectively, which was a substantial increase. Also contributing significantly to the rise in value of the State's nonfuel mineral production in 2003 were increases in the production and value of the State's aggregates; the value of construction sand and gravel rose by about \$25 million, and of crushed stone, by about \$5 million (table 1).

The same nonfuel mineral commodities that led Arizona's increase in 2003 had been the primary reason behind its decrease in 2002. In 2002, production of copper and molybdenum fell significantly; as a consequence, the value of copper dropped by \$210 million compared with that of 2001 and molybdenum, by about \$13 million. The production and value of crushed stone, construction sand and gravel, portland cement,

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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 2003 USGS mineral production data published in this chapter are preliminary estimates as of July 2004 and are expected to change. For some mineral commodities, such as construction sand and gravel, crushed stone, and portland cement, estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Specialist contact information may be retrieved over the Internet at URL <http://minerals.usgs.gov/minerals/contacts/comdir.html>; alternatively, specialists' names and telephone numbers may be obtained by calling USGS information at (703) 648-4000 or by calling the USGS Earth Science Information Center at 1-888-ASK-USGS (275-8747). All USGS Mineral Industry Surveys and USGS Minerals Yearbook chapters—mineral commodity, State, and country—also may be retrieved over the Internet at URL <http://minerals.usgs.gov/minerals>.

<sup>2</sup>Values, percentage calculations, and rankings for 2002 may differ from the Minerals Yearbook, Area Reports: Domestic 2002, Volume II, owing to the revision of preliminary 2002 to final 2002 data. Data for 2003 are preliminary and are expected to change; related rankings also may change.

and pumice and pumicite increased by a combined estimated value of about \$15 million. The drop in both the quantity and the value of copper production, which decreased by about 13% and 14%, respectively, during 2002, was owing to lower average copper prices and a continued (since 2001) scaling back of some operations. Also showing lower production and values for 2002 were lime, which was down by about \$9 million; silver, by about \$8 million; and gold, by about \$2 million. All other changes, up or down, were about \$1 million or less and were relatively inconsequential to the overall change in the value of the State's nonfuel mineral production in 2002 (table 1).

Based upon USGS production data for the 50 States during 2003, Arizona continued to lead all States in copper and molybdenum output; it ranked second in gemstone (by value), fourth in construction sand and gravel, fifth in silver and zeolites, and seventh in dimension stone. The State's ranking decreased to 2d from 1st in the production of pumice and pumicite and to 4th from 3d in perlite; Arizona continued to rank 10th among the 10 gold-producing States. Additionally, Arizona continued to be a significant producer of portland cement, lime, and masonry cement.

The Arizona Department of Mines and Mineral Resources<sup>3</sup> (ADMMR) provided the following narrative information. Data presented in ADMMR reports may differ somewhat from data reported by the USGS in table 1.

## Exploration and Development Activities

**Copper.**—Major copper companies—Kennecott Exploration Co., Teck-Cominco Ltd., and a number of junior companies—showed renewed interest in exploration. CastleRock Resources Inc. optioned the Dover property, which was adjacent to the Morenci Mine, from Dover Copper Mining Co. Nord Resources Corp. planned to raise \$20 million to restart the company's Johnson Camp Mine and also acquired the Coyote Springs prospect in the Safford district. General Minerals Corp. was active east of ASARCO Incorporated's Ray Mine with a porphyry copper target at the Monitor Mine.

**Gold.**—Rising gold prices and the availability of funding contributed to the renewal of precious metal exploration in Arizona. American Bonanza Gold Mining Corp. continued exploration work at Copperstone. The company completed drifting to the "D" zone in early 2003 and reported multi ounce gold grades in underground samples taken. Throughout the year, the company intersected significant gold zones from a 2,700 meter (m) drill program to develop reserves. Abington Ventures Inc. reported positive intercepts of gold mineralization from a 6-hole surface core drilling program, which confirmed a

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<sup>3</sup>Nyal J. Niemuth, Mining Engineer, authored the text of the State mineral industry information provided by the Arizona Department of Mines and Mineral Resources.

high-grade gold vein at the Verdstone's 3 West zone in northern Yuma County. The property was last operated in the mid-1990s. Other junior companies also were active. Odessa Gold Corp. conducted 900 m of drilling north of Kingman near the Golconda Mine. Patriot Gold Corp. signed a letter of intent to purchase the Moss Mine, which is located 8 kilometers (km) northwest of Oatman. A prefeasibility study and 11,000 m of drilling were performed at the Moss Mine in late 1980s and early 1990s.

## Commodity Review

### Industrial Minerals

**Cement.**—ARPL Tecnologia Industrial, S.A., which was the parent company of Peruvian Cementos Lima, purchased Stirling Bridge Cement, LLC in the spring of 2003 and formed a new Arizona company, Drake Cement, LLC. The Yavapai-Apache Nation held a small investment position in the new company. Stirling Bridge had acquired land and mining claims north of Prescott near Drake and was in the design and permitting stage to develop the Cedar Glade limestone quarry property and construct a 320,000 t/yr cement plant. Drake Cement had increased the design capacity of the project to a combined total of 590,000 t/yr of Type II and Type V portland cement. Expectations were for construction of the \$130 million project to begin in March 2005 and production of cement to commence in March 2007. The new company was seeking additional U.S. partners for the project.

**Crushed Stone and Sand and Gravel.**—The residential construction market in Arizona continued to be very strong with the help of record-low interest rates. Growth and construction in the northwest portion of metropolitan Phoenix led to the opening of numerous new sand and gravel operations. These included five operators in the Calderwood Butte area along the Agua Fria River north of Sun City—Rinker Materials Corp.; Chandler RediMix Inc.; Nu West Materials; South West Sand and Gravel, Inc.; and Arizona Cemex Inc.

Rinker Materials reported buying two operations during 2003 from Superstition Crushing LLC. The properties were sand and gravel operations located in Phoenix and west of Buckeye. An innovative expansion was accomplished by Rinker Materials, which purchased a golf course adjacent to their Cortaro plant and pit north of Tucson in Marana. The purchase allowed the company to increase the areal extent of its sand and gravel resource by 40 ha, and by Rinker's construction of a new 9-hole section of golf course in the depleted pit area, the public continued to be provided with an 18-hole golf course.

In the spring of 2003, Rockland Materials filed for reorganization under Chapter 7 of the Federal bankruptcy laws. For 2002, Rockland's revenue was in the \$40 million range, and the company had 200 employees. The assets and operations of Rockland were put up for auction in December 2003 and sold to Arizona Materials, LLC on February 18, 2004, for \$8 million. The sale included what had been known as Rockland's Main Plant #1, Salt River Pit, and Buckeye State Route 85 Plant #4. Rockland's leases on aggregate deposits in Chino Valley reverted to their owners. Rockland's plans for a new cement

plant were also affected.

**Perlite.**—Therm-O-Rock West Inc. began producing perlite microspheres at its Chandler plant for customers of Basin Perlite Co. Perlite from Basin Perlite Co.'s mine in Utah was processed under a toll agreement and shipped to joint compound manufacturers in Arizona, Mexico, and Malaysia.

### Metals

**Copper.**—Phelps Dodge Corp. produced more than 75% of Arizona's copper in 2003. Higher copper prices were largely responsible for returning Phelps Dodge to profitability for the year and justified plans made in early 2004 to return two of the company's Arizona mines to full production. The company had more good news in December 2003 with the release of the U.S. Environmental Protection Agency's final environmental impact statement (EIS) for the Safford project.

Phelps Dodge's Morenci Mine continued to be Arizona's leading copper mine and for the first time produced more than one-half of the State's total copper production. The all-leach operation recovered 382,000 metric tons (t) of electrowon copper in 2003. This recovery was accomplished despite a fire during October that damaged the Metcalf solvent extraction plant, which was one of the mine's four solvent extraction (SX) plants.

In the first quarter of 2003, Phelps Dodge successfully commissioned the first-of-its-kind high-temperature and high-pressure concentrate leach plant at the company's Bagdad Mine. The \$40 million leach plant and electrowinning (EW) expansion quickly achieved design capacity. The leach vessel demonstrated a copper recovery that exceeded 98.5% and averaged 85% availability during the year. The plant had the capacity to produce 16,000 metric tons per year (t/yr) of copper; it can turn 15% of Bagdad's chalcopyrite concentrate production into copper cathodes. The plant also recovered 130 metric tons per day of sulfuric acid that was used in the oxide leach. At the end of 2003, the Bagdad concentrator operated at about 75% of capacity, but the company anticipated a return to full capacity by the second quarter of 2004. Phelps Dodge's Sierrita Mine was also targeted to return to full capacity by the fourth quarter. Bagdad added workers in 2003 and Sierrita was expected to add 100 miners during 2004. Although the doubling in molybdenum oxide prices since 2002 was of benefit to Sierrita, the company was expecting its molybdenum grade to fall in 2005.

In December 2003, Bureau of Land Management (BLM) released the final EIS for the Safford copper project. It covered two open pit mines—Dos Pobres and San Juan—and one giant heap leach project that was expected to produce 113,000 t/yr SX-EW when built. The two deposits were reported to contain 450 million metric tons of oxide ore that averaged nearly 0.4% copper. The operation planned to place mined material by using a retreat-stacking method, unlike the advance stacking used at the Morenci Mine, to avoid compaction. The single-lined 360-hectare (ha) leach pad will be the largest in the world, and 91-m stackers (the world's longest) will be used to load it. Construction was planned for 2005 to 2007 and production was scheduled to begin sometime in 2007 to 2009. An average of 450 construction workers will be needed during the 18-month

construction period, and the mine is expected employ 350 people for approximately 16 years. When completed, the mine will be an economically benefit Graham County and the State by generating an estimated \$151 million in State and local taxes and \$213.1 million in wages to employees.

The final EIS preferred alternative includes a land exchange in which Phelps Dodge would receive land near the operation and BLM would receive lands with other significant resource values, including the Tasasci Marsh, which is located adjacent to Tuzigoot National Monument; private in-holdings within the Gila Box Riparian and Las Cienegas National Conservation areas; and parcels of land that provide access to the Dos Cabezas wilderness. Safford became home to Phelps Dodge Mining Co. offices during the year, joining the company's process technology center already in operation there.

In January 2003, Asarco and the U.S. Department of Justice reached an agreement that would allow the sale of Asarco's 54% share of Southern Peru Copper Corp. to Grupo Mexico's Americas Mining Corp. for \$765 million; the sale took place on March 31 and strengthened Asarco's financial situation by cutting the company's net debt to \$226 million (a 77% reduction in the company's overall debt) and 100% cancellation of its short-term debt. The agreement also called for Asarco to fund a \$100 million trust for environmental cleanup in Arizona and other States.

Asarco operations withstood a tough economic year amid a production drop of 27%. At its Mission Mine, production declined owing to the closure of the underground portion of the mine and a temporary closure of the open pit. These cutbacks reduced output to about 22,000 t/yr, which was 25% of the level of 5 years ago. The company considered closing the mine in the late fall, but rising copper prices made that choice unnecessary. Output at Asarco's Ray Mine was down by about 45,000 t, which was a 29% drop from last year's record level. Both operations continued to suffer from the overall low copper prices and deferred investment. The cutbacks also affected downstream operations at the company's Hayden, AZ, smelter and its Amarillo, TX, refinery (Edelstein, 2004). Asarco's Silver Bell was an exception to this trend; Silver Bell increased its production by 2,700 t to 22,000 t, which was its largest output since being reborn as an SX-EW producer in 1997.

BHP Billiton's San Manuel smelter, which was one of the largest and most modern in the United States and was once thought to be the best part of the company's Magma purchase, failed to attract any buyers at the purported asking price of \$500 million, possibly owing to a lack of nearby concentrates. Late in 2003, the permanent closure of the concentrator, smelter, and refinery complex was announced. Barring any last minute sale, reclamation was scheduled to begin in 2004 and to continue for about 5 to 7 years at a cost that is likely to exceed \$100 million. All of the site's approximately 500 buildings, including the two 91-m-tall smelter stacks, will be removed.

Mercator Minerals Ltd. acquired the Mineral Park Mine from Equatorial Mining Limited in June 2003. It planned to expand production to a 5,000 t/yr from the current 1,400 t/yr by mining

new material for the leach operation. Red Mountain Mining Co. quarried and sold crushed stone from Mineral Park that would otherwise have had to be removed as waste.

No construction announcements had been made, but Cambior Inc. and BHP Billiton were considering use of BHP Billiton's Pinto Valley SX-EW plant and other facilities as a possible means to save time and reduce capital expenditures for the Carlota Mine.

**Steel.**—North Star Steel Co. closed its Kingman steel plant in March. The 5-year-old plant, which had a 590,000 t/yr capacity, made reinforcing bars and other products. Nucor Corp., which was the Nation's leading steel producer, purchased it for \$35 million, but reopening the plant would require finding a low-cost source of electricity.

## Government Programs

The ADMMR posted two reports on its Web site ([www.admmr.state.az.us](http://www.admmr.state.az.us)) that were among the most frequently downloaded from that site. The first was a BLM mineral report entitled "Results of Analyses of Standard and Blank Samples Tested at Selected Assay Laboratories in North America." In the survey that formed the basis for the report, standards and blanks for gold, palladium, platinum, and silver were sent to 65 North American laboratories that perform assays for the general public. The survey lists the name and location of each laboratory tested, with results of the tests. The BLM's National Training Center in Phoenix implemented the survey because of public land administration problems caused by inaccurate or non-reproducible precious metal assays.

The other popular download was entitled "Arizona Mining Scams and Unassayable Ore Projects of the Late 20th Century." This report provided details from a number of Arizona court cases, including 1980s schemes characterized as "desert dirt" ventures with little evidence offered in the schemes to describe the actual presence of precious metals and a more sophisticated approach of unassayable gold and platinum-group metals that came into vogue in the 1990s.

The future use of State trust lands continued to be an issue. Conflicts that resulted from certain mandates in the State constitution regarding revenue-maximizing uses of State land and, in reaction to urban sprawl, a contrary desire for preservation of State lands had a variety of groups lobbying for change, with some interests designating their "favorite" lands. Opportunities, especially related to industrial mineral mining could result if changes to the State constitution are made. Maps that show current conservation priorities for the State's trust lands may be found on the Internet at URL [www.land.state.az.us](http://www.land.state.az.us).

## Reference Cited

Edelstein, D.L., 2004, Copper: U.S. Geological Survey Mineral Commodity Summaries 2004, p. 54-55.

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

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral	2001		2002		2003 <sup>P</sup>	
	Quantity	Value	Quantity	Value	Quantity	Value
Copper <sup>3</sup>	879	1,490,000	767	1,280,000	747	1,350,000
Gemstones	NA	1,610	NA	1,670	NA	1,450
Sand and gravel, construction	52,900	288,000	53,800	294,000	58,000	319,000
Stone, crushed	8,320	49,600	8,450	51,800	9,200	57,500
Zeolites metric tons	(4)	NA	(4)	NA	(4)	NA
Combined values of cement, clays (bentonite, common), gold, gypsum, (crude), iron oxide pigments [crude, (2000)], lime, mica (2002), molybdenum concentrates, perlite (crude), pumice and pumicite, salt, sand and gravel (industrial), stone (dimension sandstone)	XX	343,000	XX	318,000	XX	372,000
Total	XX	2,170,000	XX	1,950,000	XX	2,100,000

<sup>P</sup>Preliminary. NA Not available. XX Not applicable.

<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.

<sup>4</sup>Withheld to avoid disclosing company proprietary data.

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

Kind	2001				2002			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	9	4,490	\$23,100	\$5.15	5	4,590	\$22,900	\$5.00
Marble	1	W	W	5.48	1	W	W	5.85
Granite	21	2,150	16,200	7.51	18	2,550	20,700	8.09
Traprock	1	W	W	5.51	1	W	W	5.51
Sandstone and quartzite	2	W	W	5.25	2	W	W	5.20
Volcanic cinder and scoria	7	148	769	5.20	6	117	620	5.30
Miscellaneous stone	8	1,300	8,350	6.40	7	955	6,300	6.59
Total or average	XX	8,320	49,600	5.97	XX	8,450	51,800	6.14

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

TABLE 3  
ARIZONA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2002, BY USE<sup>1</sup>

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
<b>Construction:</b>			
Coarse aggregate (+1 1/2 inch), riprap and jetty stone	W	W	\$5.49
Coarse aggregate, graded, other graded coarse aggregate	164	\$894	5.45
Fine aggregate (-3/8 inch), other fine aggregate	20	107	5.35
<b>Coarse and fine aggregates:</b>			
Graded road base or subbase	(2)	(2)	4.26
Unpaved road surfacing	(2)	(2)	4.39
Terrazzo and exposed aggregate	(2)	(2)	13.42
Crusher run (select material or fill)	(2)	(2)	3.53
Other coarse and fine aggregates	588	7,370	12.54
Total or average	588	7,370	12.54
Other construction materials	725	5,650	7.80
<b>Chemical and metallurgical:</b>			
Cement manufacture	W	W	5.14
Lime manufacture	W	W	4.41
Special, other fillers or extenders	W	W	6.56
<b>Unspecified:<sup>3</sup></b>			
Reported	1,000	6,280	6.28
Estimated	2,000	12,000	6.07
Total or average	3,020	18,600	6.14
Grand total or average	8,450	51,800	6.14

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

<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 in "Grand total."

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

TABLE 4  
ARIZONA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2002, BY USE AND DISTRICT<sup>1</sup>

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3		Unspecified districts	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
<b>Construction:</b>								
Coarse aggregate (+1 1/2 inch) <sup>2</sup>	--	--	W	W	W	W	--	--
Coarse aggregate, graded <sup>3</sup>	--	--	--	--	W	W	--	--
Fine aggregate (-3/8 inch) <sup>4</sup>	--	--	--	--	W	W	--	--
Coarse and fine aggregate <sup>5</sup>	W	W	--	--	W	W	--	--
Other construction materials	10	57	--	--	715	5,600	--	--
Agricultural <sup>6</sup>	--	--	--	--	W	W	--	--
Chemical and metallurgical <sup>7</sup>	W	W	--	--	W	W	--	--
Special <sup>8</sup>	--	--	--	--	W	W	--	--
<b>Unspecified:<sup>9</sup></b>								
Reported	51	305	43	263	70	422	837	5,290
Estimated	260	1,700	240	1,300	1,500	9,200	--	--
Total	2,900	16,700	281	1,580	4,430	28,300	837	5,290

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 riprap and jetty stone.

<sup>3</sup>Includes other graded coarse aggregates.

<sup>4</sup>Includes other fine aggregates.

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

<sup>6</sup>Includes poultry grit and mineral food.

<sup>7</sup>Includes cement and lime manufacture.

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

<sup>9</sup>Reported and estimated production without a breakdown by end use.

TABLE 5  
ARIZONA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2002,  
BY MAJOR USE CATEGORY<sup>1</sup>

Use	Quantity		Unit value
	(thousand metric tons)	(thousands)	
Concrete aggregate (including concrete sand)	5,060	\$30,800	\$6.10
Plaster and gunite sands	632	3,520	5.57
Concrete products (blocks, bricks, pipe, decorative, etc.)	130	886	6.82
Asphaltic concrete aggregates and other bituminous mixtures	2,050	11,900	5.81
Road base and coverings	9,860	48,700	4.94
Fill	750	2,930	3.91
Snow and ice control	1	13	13.00
Railroad ballast	24	134	5.58
Other miscellaneous uses	202	2,190	10.84
Unspecified: <sup>2</sup>			
Reported	25,900	143,000	5.53
Estimated	9,200	50,000	5.43
Total or average	53,800	294,000	5.48

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

TABLE 6  
ARIZONA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2002,  
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)	408	2,920	136	969	4,510	27,000
Concrete products (blocks, bricks, pipe, decorative, etc.)	--	--	--	--	130	886
Plaster and gunite sands	W	W	W	W	565	2,890
Asphaltic concrete aggregates and other bituminous mixtures	W	W	W	W	1,510	8,570
Road base materials	1,030	6,400	135	748	8,690	41,600
Fill	57	178	35	130	658	2,620
Snow and ice control	--	--	1	13	--	--
Other miscellaneous uses <sup>2</sup>	367	3,450	119	836	121	1,230
Unspecified: <sup>3</sup>						
Reported	3,530	18,900	272	1,390	21,300	122,000
Estimated	1,700	9,000	1,300	7,000	6,300	34,000
Total	7,070	40,900	1,960	11,000	43,800	241,000
	Unspecified district					
	Quantity	Value				
Concrete aggregate (including concrete sand)	--	--				
Concrete products (blocks, bricks, pipe, decorative, etc.)	--	--				
Plaster and gunite sands	--	--				
Asphaltic concrete aggregates and other bituminous mixtures	212	661				
Road base materials	--	--				
Fill	--	--				
Snow and ice control	--	--				
Other miscellaneous uses <sup>2</sup>	--	--				
Unspecified: <sup>3</sup>						
Reported	722	1,210				
Estimated	--	--				
Total	934	1,880				

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 railroad ballast.

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