

## **CALIFORNIA'S NON-FUEL MINERAL PRODUCTION 2001**

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Based on the U.S. Geological Survey's (USGS) preliminary data for 2001, California ranked first among the states in non-fuel mineral production, accounting for approximately 8.4 percent of the United States' total. Mineral production for California amounted to \$3.27 billion, about a one percent decrease from the previous year. Production of at least 32 types of industrial minerals in the state accounted for about 96 percent of the total value, with metals (gold and silver) accounting for 4 percent of the total. California was the only producer of boron, rare earth ore, and asbestos, and continued to lead the nation in the production of sand and gravel, diatomite, and natural sodium sulfate. California ranked fourth in the nation for gold production behind Nevada, Utah and Alaska. California dropped to second place for portland cement behind Texas. Other minerals produced in California include bentonite clay (including hectorite), common clay, crushed stone, dimension stone, feldspar, fire clay, fuller's earth, gemstones, gypsum, iron ore, kaolin clay, lime, magnesium compounds, perlite, pumice, pumicite, pyrophyllite, salt, silver, soda ash, sodium bicarbonate, talc, and zeolites.

There are about 1,000 active mines producing non-fuel minerals in the state. Approximately 9,300 people are employed at these mines and their processing plants.

### **INDUSTRIAL MINERALS**

Construction sand and gravel was California's leading industrial mineral with a total value of \$953 million produced for the year, a one percent increase from 2000 (final USGS data). Sand and gravel production was estimated to be the same as in 2000. Vulcan Materials Company/Western Division's Boulevard plant (Los Angeles County) led the state and the nation in sand and gravel production. Portland cement was the second largest industrial mineral produced in the state with a total production of 11.2 million tons valued at about \$768 million. Boron valued at about \$557 million, ranked third and crushed stone ranked fourth with a value of \$380 million.

A permit expansion for Lehigh Southwest Cement Company's (formerly Calaveras Cement Company) Gray Rock limestone quarry in Shasta County was approved by the Shasta County Planning Commission in December 2001. The updated permit allows for an additional 48 million tons of high-quality limestone to be mined over a 50-year period from the existing site that has operated since 1960.

Teichert Aggregates submitted the final EIR for its Lincoln project, a 720-acre aggregate site located about four miles north of the town of Lincoln (Placer County). The project calls for the extraction of 37 million tons of construction alluvial sand and gravel, and 122 million tons of crushed granite aggregate over a period of 85 years.

Mining commenced in March 2001 at Calaveras Material's Inc.'s Woolstenhulme Ranch sand and gravel mine (Merced County). Approximately 15 million tons of aggregate will be mined at the site over a period of about 25-30 years. The material will be processed at Calaveras Materials Inc.'s River Rock Plant near Snelling (Merced County).

Molycorp Inc. continued its permitting process for an enlargement of the current pit and an on-site tailings pond for its world-class Mountain Pass rare earths mine (San Bernardino County). Prior to closure in 1998, Molycorp recovered the rare earths cerium, lanthanum, neodymium, praseodymium, samarium, europium, gadolinium, yttrium and terbium from bastnasite ore mined at its Mountain Pass Mine. In 2000, Molycorp was permitted to mine bastnasite ore but processing was limited to the recovery of raw and leached bastnasite. The recovery of rare earths at the plant is contingent on the completion of a new on-site tailings impoundment and evaporation pond. Molycorp anticipates having permits for the remodeled



Bulk cargo deep-draft ship, the Sheila Ann, unloading aggregate at the Long Beach Harbor, Los Angeles County. Ships like the Sheila Ann can haul up to 70,000 tons of aggregate (*photo courtesy of the Port of Long Beach*).

processing facility by the end of 2002 and plans to be back in full production by 2004. The Mountain Pass Mine was the only producer of rare earths in the United States.

Teichert Materials acquired two mine properties in September 2001, the American River Aggregates property in Sacramento County and the Cool Cave Quarry in El Dorado County. The American River Aggregates property will be renamed as two separate facilities: Teichert Grantline Plant and Teichert Prairie City Sand Plant. The Cool Cave Quarry was purchased from Spreckles Limestone Products which mined high quality limestone to supply lime for its sugar plants in Woodland (Yolo County) and Tracy (San Joaquin County). Base rock and riprap was also produced at the quarry. Teichert Materials plans to continue aggregate production at the quarry and also pursue other markets for the high-grade limestone.

CEMEX, Inc.'s newly acquired Victorville cement plant (San Bernardino County) completed a one-million-ton-per-year plant expansion increasing the plant capacity to 3.2 million tons per year.

After 75 years of operation, Hansen Aggregates Mid Pacific, Inc.'s Radum operation in the Pleasanton area (Alameda County) ceased mining in late November 2001. The operation was the largest alluvial sand and gravel producer in Northern California with an annual production of 4-5 million tons. The Radum

Mine and Plant produced roughly 25 percent of the aggregate used in the South San Francisco Bay area. Hansen Aggregates is making up a portion of the deficit by shipping aggregate almost 1,000 nautical miles from British Columbia to the San Francisco Bay area. Self-unloading bulk cargo deep-draft vessels hauling up to 70,000 tons of aggregate began delivering aggregate in late 2000 after the Port of San Francisco and Hanson Aggregates entered into a five-year contract to develop a bulk-cargo shipping terminal at the Port's Pier 94.

In addition to the San Francisco Bay Region, bulk cargo ships have transported aggregate from British Columbia to San Diego and Long Beach.

## METALLIC MINERALS

Gold production continued to decline during the year with a total of 449,200 troy ounces produced at a total value of \$122.3 million. This is a 19 percent decrease in production and 21 percent decrease in value from 2000. In the next 2-3 years, California's gold production is expected to drop by about 70 percent.

Silver production makes up less than one percent of California's total metal production. All of the silver produced in California is a byproduct of gold production. Iron was produced and used in the production of portland cement and is included in the industrial mineral category.

Homestake's McLaughlin Mine (Napa, Lake, and Yolo counties) ranked number one in California gold production in 2001. The McLaughlin Mine has been operating since 1985 and was California's largest producer of gold from 1985 to 1995. Mining operations ceased at the McLaughlin Mine in 1996, but gold processing is expected to continue through May 2002. Barrick Gold Corporation acquired Homestake Mining Company for \$2.2 billion in December 2001.

Canyon Resources Corp.'s Briggs Mine (Inyo County) was the second largest gold producer in the state in 2001. Newmont's Mesquite Mine (Imperial County), which ranked number one in gold production from 1996 through 2000, ranked number three in 2001. Although the Mesquite Mine ceased mining in the fall of 2000, leaching of gold is expected to continue into 2003.

California's fourth largest gold producer, Viceroy Gold's and MK Gold's Castle Mountain Mine (San Bernardino County) ceased mining in May 2001. The mine has produced about 1,150,000 troy ounces of gold during its 10 years of operation. Heap leaching will continue at the mine until 2003 or 2004 and reclamation is expected to be completed by 2004.

Glamis Gold Ltd.'s Imperial gold project (Imperial County) was denied in January 2001. However, the denial was rescinded in October 2001, allowing Glamis to continue the permitting process. Glamis Gold Ltd. commenced final reclamation on their heap leaching facility at the Picacho Mine (Imperial County), and final reclamation was completed in March 2002. The historic Picacho Mine was reopened as an open-pit heap leach operation by Glamis Gold in 1981 and was mined up until 1998. Gold production ceased in 2000. Glamis Gold has produced 388,000 troy ounces of gold from the Picacho Mine during its 20 years of operation.

Lassen Gold Mining Inc. completed heap leaching in September 2001 at their Haden Hill gold mine (Lassen County). Mining ceased at the mine in December of 1997. The mine has produced more than 500,000 troy ounces of gold since production began in 1992.



Syar Industries Inc.'s Lake Herman Quarry in Solano County. Jurassic basalt suitable for concrete-grade aggregate is mined at the quarry. The rock is a significant source of aggregate to the North San Francisco Bay Region (photo by Don Dupras).

REGULATION

An amendment (adopted in July 2000) to an existing measure, by the California Air Resources Board (CARB) prohibits the sale or use of aggregate derived from serpentinite or ultramafic rock for unpaved roads unless it has been tested and found to have an asbestos content that is less than 0.25 percent. The amendment went into effect on November 13, 2001.

NAME CHANGE

In January 2002, the name of the Division of Mines and Geology was changed to the California Geological Survey (CGS). CGS consists of several programs including Mineral Resources and Mineral Hazards Mapping, Seismic Hazards Mapping, Strong Motion Instrumentation, Regional Geologic and Hazards Mapping, Timber Harvest Enforcement and Watershed Restoration, and North Coast Watershed Assessment. Consequently, the new name change will better reflect the diverse geological activities conducted by CGS.

## MINERAL RESOURCE CONSERVATION

The Department of Conservation's CGS Mineral Land Classification Project, a mandate of the Surface Mining and Reclamation Act, continues to provide lead agencies with mineral resource maps that have proved to be of great value in land-use planning and mineral resource conservation. In 2001, CGS completed a Mineral Land Classification report in Lassen County and had ongoing projects in Solano, Napa, Sonoma, Marin, San Bernardino, and Riverside counties. CGS has classified a little over one third of the state for mineral resources.



MolyCorp Inc.'s world class rare earths Mountain Pass Mine in San Bernardino County. The ore mined from the quarry is bastnasite, a cesium lanthanum carbonate that contains 15 different rare earth elements. The mine has been in operation since 1951 (photo by Robert Hill).

Amount and value of non-fluel mineral production for 1999, 2000, 2001. <sup>1,2</sup>

Mineral	1999		2000		2001 <sup>P</sup>	
	Quantity	Value (thousands \$)	Quantity	Value (thousands \$)	Quantity	Value (thousands \$)
Asbestos short tons	7,900	W	5,800	W	5,800	W
Boron Minerals (B <sub>2</sub> O <sub>3</sub> ) short tons	681,300	630,000	602,000	546,000	716,600	557,000
Cement:						
Masonry short tons	<sup>e</sup> 513,800	<sup>e</sup> 38,300	<sup>e</sup> 533,600	<sup>e</sup> 43,200	<sup>e</sup> 521,000	<sup>e</sup> 49,900
Portland short tons	<sup>e</sup> 11,344,700	<sup>e</sup> 816,900	<sup>e</sup> 12,017,200	<sup>e</sup> 821,000	<sup>e</sup> 11,245,500	<sup>e</sup> 768,000
Clays						
Bentonite short tons	33,900	2,500	23,600	2,200	23,700	2,100
Common short tons	1,017,900	9,400	1,067,800	16,800	1,068,300	16,800
Gemstones	NA	1,100	NA	1,500	NA	1,200
Gold <sup>3</sup> troy ounces	562,600	157,400	553,000	154,900	<sup>4</sup> 449,200	<sup>4</sup> 122,300
Gypsum <sup>5</sup> short tons	3,561,800	18,700	3,534,600	45,600	3,197,200	39,300
Sand and gravel:						
Construction short tons	159,505,300	897,300	163,170,000	940,000	163,170,000	953,000
Industrial short tons	1,972,400	43,700	1,992,200	45,200	1,934,900	44,000
Silver <sup>3</sup> troy ounces	257,200	1,300	<sup>4</sup> 281,700	<sup>4</sup> 1,400	<sup>4</sup> 233,800	<sup>4</sup> 1,000
Stone:						
Crushed short tons	66,452,100	388,200	65,819,200	373,000	65,047,500	380,000
Dimension short tons	32,400	4,900	36,700	5,800	<sup>e</sup> 36,400	<sup>e</sup> 6,000
Combined value of diatomite, feldspar, fire clay, fuller's earth, iron ore (usable), kaolin, lime, magnesium compounds, perlite (crude), pumice and pumicite, rare earths, salt, soda ash, sodium bicarbonate, sodium sulfate, talc and pyrophyllite, zeolites, and values indicated symbol W	XX	341,500	XX	305,900	XX	327,300
<b>Total</b>	XX	3,351,200	XX	3,302,400	XX	3,267,900

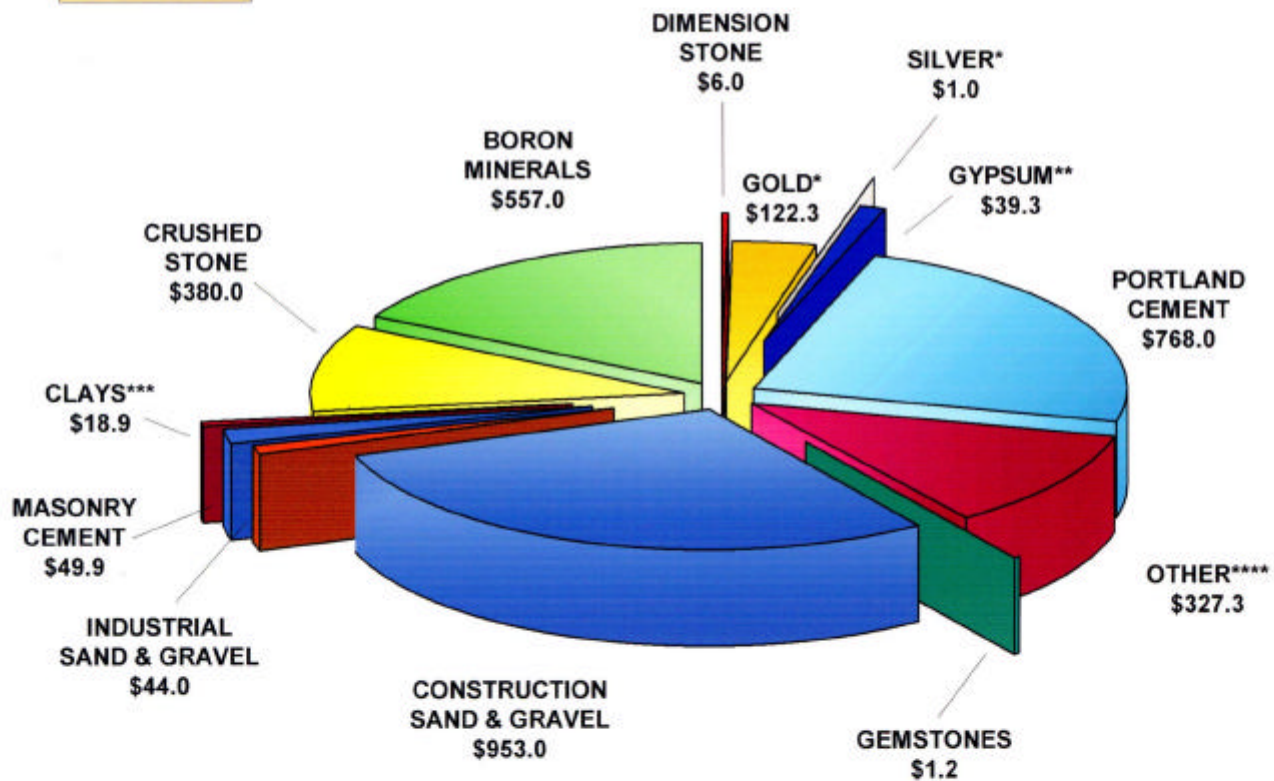
<sup>1</sup>Production as measured by mine shipments, sales, or marketable production (including consumption by producers).  
<sup>2</sup>Quantity data are rounded to the nearest 100; values are rounded to the nearest \$100,000.  
<sup>3</sup>Recoverable content of ores, etc.  
<sup>4</sup>Data from California Department of Conservation, California Geological Survey.  
<sup>5</sup>Data modified from U.S. Geological Survey Mineral Information Service, includes calcined, byproduct and crude gypsum.  
<sup>P</sup>Preliminary. <sup>e</sup>Estimate. NA=Not available. W=Withheld to avoid disclosing company proprietary data; value included with "combined value" data.  
XX = Not applicable.

Modified from Mineral Industry Surveys: California, U.S. Geological Survey.

# CALIFORNIA NON-FUEL MINERALS 2001

Total Value \$3.27 Billion

VALUES IN  
MILLIONS OF  
DOLLARS



Data modified from U.S. Geological Survey  
Mineral Information Service  
(preliminary data)

\*Data from California Geological Survey

\*\*Includes calcined, byproduct and  
crude gypsum

\*\*\*Excludes fire clay, kaolin,  
and fuller's earth

\*\*\*\*OTHER Includes:

Asbestos, diatomite, feldspar, fire clay, fuller's earth, iron ore, kaolin, lime, magnesium compounds, perlite, pumice and pumicite, pyrophyllite, rare earths, salt, soda ash, talc, sodium bicarbonate, sodium sulfate, and zeolites.

