

# **CALIFORNIA NON-FUEL MINERALS 2009**

**By John Clinkenbeard, Supervising Engineering Geologist and Joshua Smith, Engineering Geologist, California Geological Survey**

Based on the U.S. Geological Survey's (USGS) preliminary data for 2009, California ranked fourth after Utah, Arizona and Nevada in the value of non-fuel mineral production, accounting for approximately 6.3 percent of the nation's total. The market value of non-fuel mineral production for California was \$3.4 billion. California produced more than two dozen different industrial minerals during the year. California led the nation in the production of sand and gravel, diatomite, and natural sodium sulfate, and was the only producer of boron compounds and rare earth minerals. The state ranked second behind Texas for portland cement production. The only metals produced were gold and silver. California ranked 6<sup>th</sup> in gold production out of eleven states that reported for the year. Other minerals produced commercially include common clay, bentonite clay (including hectorite), crushed stone, dimension stone, feldspar, fuller's earth, gemstones, gypsum, iron ore (used in cement manufacture), kaolin clay, lime, magnesium compounds, perlite, pumice, pumicite, salt, soda ash, and zeolites.

There were about 700 active mines in California producing non-fuel minerals during 2009. Approximately 5,300 people were employed at these mines and their processing plants.

## **INDUSTRIAL MINERALS**

The continuing downturn in the state, national, and world economies again impacted California's mineral industries during the year. Particularly hard hit were construction materials such as sand and gravel, crushed stone, and portland cement. Low levels of residential and commercial construction again led to reduced demand for these commodities.

Construction grade sand and gravel continued to be California's leading industrial mineral, with an estimated total value of \$905 million for 85 million tons produced. California's second largest mineral commodity was portland cement valued at \$855 million for 9.3 million tons produced. The third largest dollar value mineral produced in 2009 was boron. Because there are only two producers of boron in the state, specific production values are withheld and are included in the "other" category in the table and figure. Boron makes up more than 60 percent of the "other" category. Crushed stone ranked fourth in the state with a value of \$513 million for 48 million tons produced.

## **Aggregate**

Both production and value of construction aggregate (sand and gravel and crushed stone) decreased again in 2009. Total production of these two commodities in 2009 was 133.5 million tons valued at slightly over \$1.4 billion. The total production of 133.5 million tons in 2009 compares to 156.7 million tons in 2008, 208 million tons in 2007, and 246 million tons in 2006 – amounting to an almost 15 percent decrease from 2008, a 36 percent decrease since 2007, and an almost 46 percent decrease since 2006.

In February 2009, President Obama signed the American Recovery and Reinvestment Act with one of its goals being the development and enhancement of infrastructure. Governor Schwarzenegger announced in September 2009 that over \$2 billion in American Recovery and Reinvestment Act funds had been federally obligated to 620 transportation infrastructure projects statewide. Many of these projects will likely require large amounts of construction aggregate.

North Valley Rock LLC received a permit to mine sand and gravel at a site eight miles southeast of the City of Orland in Glenn County. This site, the Finch Ranch Mine, will provide 12 million tons of sand and gravel over an estimated 25 years of mining.

Also in Glenn County, Baldwin Contracting Company Inc. (Knife River Construction) received a 30-year extension of its permit to mine sand and gravel at its Stony Creek facility located about 2.5 miles northwest of the city of Orland.

Granite Construction Company submitted a DEIR in September 2009 proposing the development of a 65-acre sand and gravel mine one mile north of Ukiah, in Mendocino County. The proposed Kunzler Terrace Mine would extract an average of 100,000 to 200,000 tons per year with a total extraction of 3.37 million tons over the 20 years of expected mining.

Triangle Rock Products Inc, a subsidiary of Vulcan Materials Company received approval in February 2009 to expand its current operation north of Florin Road, Sacramento County to a 98-acre site south of Florin Road. The proposed mine expansion will yield about 10.7 million tons of gravel over a 12 year life span. The plan also calls for the preservation of a 23 acre wildlife corridor along Laguna Creek west of the proposed mining area.

The Dutra Group's San Rafael Rock Quarry in Marin County gained approval of their proposed environmental impact report from the county supervisors in October 2009. The quarry will increase its depth of mining, increasing its resources and extending the mine's life for another 17 years.

Vulcan Materials Company's Fish Canyon mining operation is in the process of revising its mining plan. The proposed revisions would shift future mining from 80 acres of unmined land on its eastern property line to 80 acres of unmined land near its western property line. The proposed changes have met with resistance from the adjacent community of Duarte, from which mining along the western property line would be visible. A draft environmental impacts report was filed in December 2009 and was approved by the Azusa City Council in July of 2010. The approval was contested and taken to court by the City of Duarte. A final ruling on the case is expected in of 2011.

In Riverside County a mining permit was issued to Simon Concrete and Aggregate LLC for the Section 31 Sand & Gravel Mine. The 312 acre site, located about 4.5 miles north of Indio, will provide approximately 24 million tons of sand and gravel over an estimated 25 years of mining.

The permitting process for Granite Construction Company's Liberty Quarry project, located in southeastern Riverside County about three miles south of the City of Temecula, continued throughout the year. A DEIR was released in July 2009 and public comment was continued through November 2009. In June 2009, the City of Temecula's application to annex almost 5,000 acres in the vicinity of, and including, the Liberty Quarry project site was denied. Had it been successful, the annexation would have changed the permitting agency for the quarry from Riverside County to the City of Temecula.

## **Cement**

California's continuing low levels of residential and commercial construction during 2009 contributed to a further drop in both cement production and cement imports for the year. Many plants continued to operate on a reduced schedule to accommodate the lower demand. California's production of portland cement for 2009 was estimated at about 9.3 million tons valued at \$855 million.

In January 2010, CEMEX announced the permanent closure of its Davenport cement plant, Santa Cruz County. The Company had announced a temporary closure of the plant in March 2009 because of the declining demand for cement during the recession. The plant, originally constructed in 1906 by the Standard Portland Cement Company, primarily served the San Francisco Bay Area. Over its 100+ year history it supplied cement for projects such as the rebuilding of San Francisco after the 1906 earthquake, the Golden Gate Bridge, the California Aqueduct, the Bay Area Rapid Transit (BART) system, Pearl Harbor in Hawaii, and the Panama Canal.

Texas Industries, Inc.'s Riverside Cement Crestmore cement plant located north of Riverside, Riverside County remained idle for the year. Texas Industries, Inc.'s Oro Grande facility in San Bernardino County was also idled at times during the year in order to control inventories.

The Port of Stockton, San Joaquin County, experienced another year of declining imports. The port had a 45 percent decrease from 2008 imports of 330,000 tons to 2009 imports of 184,000 tons. When compared to the 2006 imports of 2.4 million tons, the decline was about 92 percent. Overall, cement imports through California ports have continued to decline as demand has fallen off.

### **Rare Earth Elements**

The Mountain Pass Rare Earth Mine, San Bernardino County, was purchased from Chevron by a group of U.S. based investors on September 30, 2008 forming Molycorp Minerals LLC, a Denver based company which owns and operates the mine. The new company continued separating rare earth elements from stockpiled rare earth concentrates during 2009.

The existing plant has a capacity of about 4.5 million pounds of rare earth products per year but plans are under way to increase capacity to about 6 million pounds annually by 2010. The stockpiled rare earth concentrates are expected to last until 2010, at which point the plant feed will change to bastnasite concentrate.

### **METALS**

The only metals produced in California in 2009 were gold and silver. Gold dominated California's metal production in 2009 – comprising over 99.9 percent of the value of the state's metals production. Gold production increased to 159,900 ounces in 2009, a 39 percent increase from 2008 production of 115,300 ounces. The value of gold production in the state increased to \$138.5 million from \$100.6 million in 2008.

The State's largest gold producer was the New Gold Inc., Mesquite gold mine in Imperial County – producing approximately 150,000 ounces for the year. New Gold acquired the mine in June 2009. Prior to the acquisition by New Gold Inc., Western Goldfields Inc., which acquired the Mesquite Mine from Newmont Mining Corporation in 2003, had restarted commercial production at Mesquite in 2008. As of July 27, 2010, New Gold had identified and estimated 3.1 million ounces in reserves and an additional 4.9 million ounces of measured and indicated resources.

The other major producer of gold in California was the Atna Resources Ltd., Briggs mine in Inyo County. The mine was reopened after the merger of the previous owner, Canyon Resource Corporation, and Atna in March of 2008. The Briggs mine resumed production in early 2009 and produced about 11,000 ounces of gold over the entire year. Atna Resources plans to increase production at this mine in future years to between 36,000 and 40,000 ounces per year.

In addition to the above mentioned lode mines, placer gold is produced as a by-product from many sand and gravel mines in the northern and central parts of the state. California also has several small lode mines that sporadically produce specimen gold including gold in quartz for use in jewelry.

Silver is produced as a by-product of gold production and makes up less than one tenth of one percent of California's total metal production. Iron ore, mined in one location in San Bernardino County, is considered an industrial mineral because it is used for the productions of portland cement.

## **THE CALIFORNIA GEOLOGICAL SURVEY**

The California Geological Survey's (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 completed mineral resource studies in about one third of the state. During the year, CGS completed and updated classification projects in Kern County, Riverside County, and Sacramento County. CGS also assisted the State Mining and Geology Board in the designation process for the Palm Springs Production-Consumption Region in Riverside County, and the Claremont-Upland Production-Consumption Region in Los Angeles and San Bernardino counties. Classification updates are ongoing in the San Luis Obispo/Santa Barbara area, the San Gabriel Valley area, the Stockton-Lodi area, and the North San Francisco Bay area.

Amount and value of non-fuel mineral production for 2007, 2008, 2009. <sup>1,2</sup>

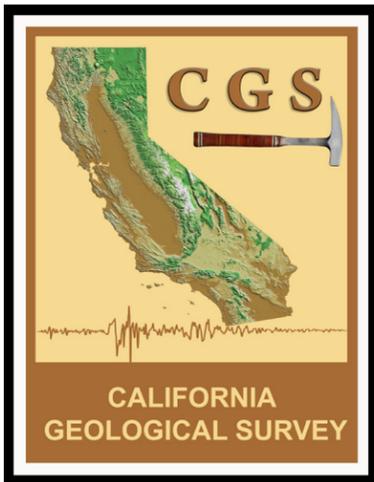
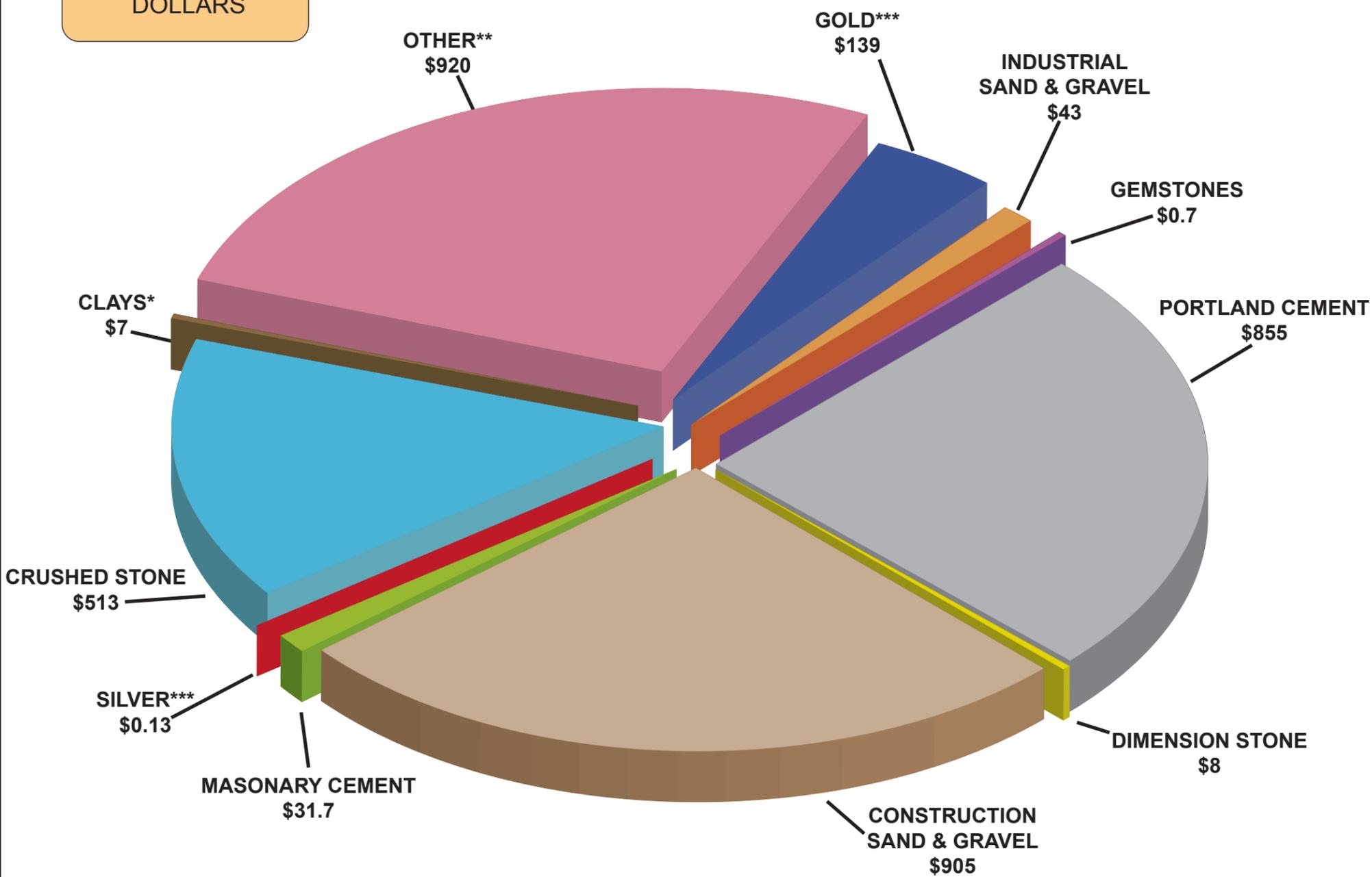
Mineral	2007		2008		2009 <sup>P</sup>	
	Quantity	Value (thousands \$)	Quantity	Value (thousands \$)	Quantity	Value (thousands \$)
Boron Minerals short tons	W	<sup>e</sup> 460,000	W	<sup>e</sup> 4700,000	W	W
Cement						
Masonry short tons	<sup>e</sup> 576,000	<sup>e</sup> 68,900	<sup>e</sup> 377,000	<sup>e</sup> 46,000	<sup>e</sup> 270,000	<sup>e</sup> 31,700
Portland short tons	<sup>e</sup> 11,943,000	<sup>e</sup> 1,180,000	<sup>e</sup> 10,496,000	<sup>e</sup> 1,091,000	<sup>e</sup> 9,348,000	<sup>e</sup> 855,000
Clays:						
Bentonite short tons	32,000	3,100	33,000	3,200	21,000	2,300
Common short tons	605,000	4,000	515,000	3,400	420,000	4,300
Gemstones	NA	800	NA	700	NA	700
Gold <sup>3</sup> troy ounces	<sup>4</sup> 19,400	<sup>4</sup> 13,000	<sup>4</sup> 119,300	<sup>4</sup> 104,100	<sup>4</sup> 159,900	<sup>4</sup> 138,500
Sand and gravel:						
Construction short tons	148,134,000	1,450,300	108,529,000	1,105,100	85,112,000	905,500
Industrial short tons	2,034,000	43,400	1,940,000	42,900	1,606,000	42,800
Silver <sup>3</sup> troy ounces	W	W	3,590	50	11,100	130
Stone:						
Crushed short tons	59,839,000	567,900	48,196,000	480,300	48,386,000	512,800
Dimension short tons	43,000	12,300	47,000	12,200	30,000	7,600
Values for boron (2009), diatomite, feldspar, gypsum (calcined), iron ore (usable shipped), clay (fire, fullers earth, and kaolin), lime, magnesium compounds, perlite (crude), pumice and pumicite, rare earths (2008), salt, silver (2007) (2007) soda ash, sodium sulfate (2007,2008), and zeolites are combined to avoid disclosing company proprietary data.						
Total combined and W values		341,400		393,300		920,000
<b>Total annual value-all minerals</b>		<b>4,285,100</b>		<b>3,978,800</b>		<b>3,421,300</b>
<sup>1</sup> Production as measured by mine shipments, sales, or marketable production (including consumption by producers). <sup>2</sup> Quantity and value data are rounded to the nearest 100 units except for 2008 silver (rounded to nearest 10 units). <sup>3</sup> Recoverable content of ores, etc. <sup>4</sup> Data from California Department of Conservation, California Geological Survey. <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.						

Modified from unpublished U.S. Geological Survey (USGS) data, subject to change; official USGS final 2009 data will be published in the California chapter of the USGS Mineral Yearbook, Area Reports: Domestic 2009, Volume II.

# CALIFORNIA NON-FUEL MINERAL PRODUCTION 2009

Total Value \$3.4 Billion

VALUES IN  
MILLIONS OF  
DOLLARS



\*CLAYS Includes:  
bentonite and common

\*\*OTHER Includes:  
boron minerals, clays (fire, kaolin and fuller's earth), diatomite, feldspar, gypsum, iron ore, lime, magnesium compounds, perlite, salt, soda ash, talc, and zeolites

\*\*\*Data from California Geological Survey  
Information modified from preliminary unpublished U.S. Geological (USGS) data and subject to change; Official USGS final 2009 data will be published in the California Chapter of the USGS Mineral Year Book, Area Reports: Domestic 2009 Volume II.