

CALIFORNIA NON-FUEL MINERALS 2016

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Based on U.S. Geological Survey (USGS) preliminary data for 2016, California ranked fourth -- after Nevada, Arizona, and Texas -- in the value of non-fuel mineral production, accounting for approximately 4.5 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 non-fuel mineral commodities during the year, and was the only U.S. producer of boron compounds. It led the nation in the production of diatomite and construction sand and gravel. California was second behind Texas in portland cement production. Other mineral commodities produced include clay [bentonite, common, kaolin, montmorillonite (fuller's earth)], crushed stone, dimension stone, feldspar, gemstones, gypsum, industrial sand and gravel, lime, magnesium compounds, masonry cement, pumice, pumicite, salt, silver, soda ash, and zeolites.

There were about 663 active mines in California producing non-fuel minerals during 2016 (California Division of Mine Reclamation). Approximately 5,200 people were employed at these mines and their processing facilities (California Employment Development Department, Labor Market Information Division).

INDUSTRIAL MINERALS

Construction grade sand and gravel was California's leading mineral commodity in terms of dollar value in 2016. The total value of construction sand and gravel produced in California in 2016 was \$1.09 billion for 102 million tons produced compared to the revised 2015 totals of \$1.09 billion for 107 million tons produced. Portland cement ranked second in value at \$912 million for 10.6 million tons produced, an increase over the revised 2015 value of \$887 million for 10.8 million tons produced. Boron minerals ranked third in value; because there are only two producers in the state, specific production values are withheld to protect proprietary company information. The value of boron production is included in the "other" category in the table and chart. Crushed stone ranked fourth with a value of \$326 million for 39.7 million tons produced, a decrease in value and production compared to the revised 2015 totals of \$331 million for 42.3 million tons produced.

Construction materials, including aggregate (sand and gravel and crushed stone) and cement, accounted for about 69 percent of the value of California's annual non-fuel mineral production in 2016. The building and paving industries consume large quantities of construction materials. These materials are essential to the state's economy, both to maintain existing infrastructure and to provide for new construction.

Aggregate

Total production of construction aggregate (sand and gravel and crushed stone) in 2016 was 141.8 million tons valued at \$1.42 billion. This compares to the revised 2015 production of 149.3 million tons valued at \$1.42 billion. The average statewide production of construction aggregate over the last 30 years (1987-2016) has been about 180 million tons per year.

Imports of sand and gravel by ship and barge from Canada and Mexico continued at a low level. Aggregate from British Columbia came into ports in the San Francisco area and into the Port of Long Beach. Aggregate from Mexico, primarily sand, came into the San Diego market area. The quantity of aggregate imported into California remains small when compared to the consumption of aggregate in the state.

In September 2016, the Kern County Planning Commission approved a conditional use permit for the development of the Solari Sand and Gravel mine for production of 77 million tons of aggregate over 30 years.

Also in September 2016, the Madera County Board of Supervisors approved a conditional use permit for the development of the Austin Quarry for production of 250 million tons of aggregate over 100 years.

In October 2016, the Napa County Planning Commission approved an expansion of the Syar Industries Napa Quarry increasing the permitted annual production from 1 million to 1.3 million tons and extending the quarry life 35 years.

In December 2016, the Kern County Board of Supervisors approved an expansion of the San Emidio Quarry increasing the permitted annual production from 1.9 million to 5 million tons and increasing reserves to from 55 million to 1.47 billion tons.

Cement

Portland cement production was 10.6 million tons valued at \$912 million in 2016, ranking second in value among commodities produced in the state. This is a slight decrease from the revised 2015 production of 10.8 million tons, but an increase over the 2015 value of \$887 million. Cement imports through California ports remained at low levels in 2016 but appears to be increasing.

Rare Earth Elements

There was no production of rare earth elements reported in 2016. Molycorp Minerals LLC., operator of the Mountain Pass Mine in San Bernardino County, filed for Chapter 11 bankruptcy in 2015 and placed the mine and processing facility on care and maintenance. Prior to being placed on care and maintenance, the Mountain Pass Mine was the only domestic producer of rare earth elements.

METALS

Gold dominated California's metal production in 2016 – comprising over 98 percent of the value of the state's metals production. Gold production decreased to 138,015 troy ounces in 2016, from a 2015 production of 160,768 troy ounces. The value of gold production in the state also decreased from \$187.4 million in 2015 to \$172.8 million in 2016.

The state's largest gold producer was the New Gold Inc., Mesquite Mine in Imperial County – approximately 113,844 troy ounces for the year.

Golden Queen Mining Company, Ltd. completed construction of its Soledad Mountain project located approximately five miles south of Mojave in Kern County. The open pit mine uses cyanide heap leach and Merrill-Crowe processes to recover gold and silver. Commercial production was declared in December 2016. Gold production for 2016 was 19,030 troy ounces.

In May 2016, DV Natural Resources, LLC purchased the Briggs Mine in Inyo County. Atna Resources, Ltd., the previous operator, filed for Chapter 11 bankruptcy protection in 2015. There was no reported production in 2016.

In addition to the above-mentioned lode mines, placer gold was 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 gold, including specimen gold and gold in quartz for use in jewelry.

Silver is produced as a byproduct of gold production and makes up less than two percent of California's total metal production by value. Silver production increased in 2016 compared to revised 2015 quantities due primarily to production at Soledad Mountain.

A small amount of iron ore was produced in 2016. Much of the iron ore currently produced in California is used in the production of portland cement. It is considered an industrial mineral.

REVISIONS TO 2015 DATA

Based on revised USGS data for 2015, the market value of non-fuel minerals decreased from \$3.60 to \$3.39 billion. The revised 2015 data appears in the table.

THE CALIFORNIA GEOLOGICAL SURVEY

The California Geological Survey (CGS) Mineral Land Classification Project, a mandate of the Surface Mining and Reclamation Act (Public Resources Code Section 2710, et seq.), continued to provide lead agencies with mineral resource maps that have proved to be of 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 2016, CGS assisted the State Mining and Geology Board with mineral land designation activities in the San Bernardino, Stockton-Lodi, San Luis Obispo-Santa Barbara, and North San Francisco Bay Production-Consumption regions. Classification updates were ongoing in the Western San Diego County, South San Francisco Bay, and Greater Sacramento Area regions.

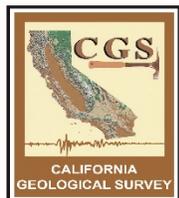
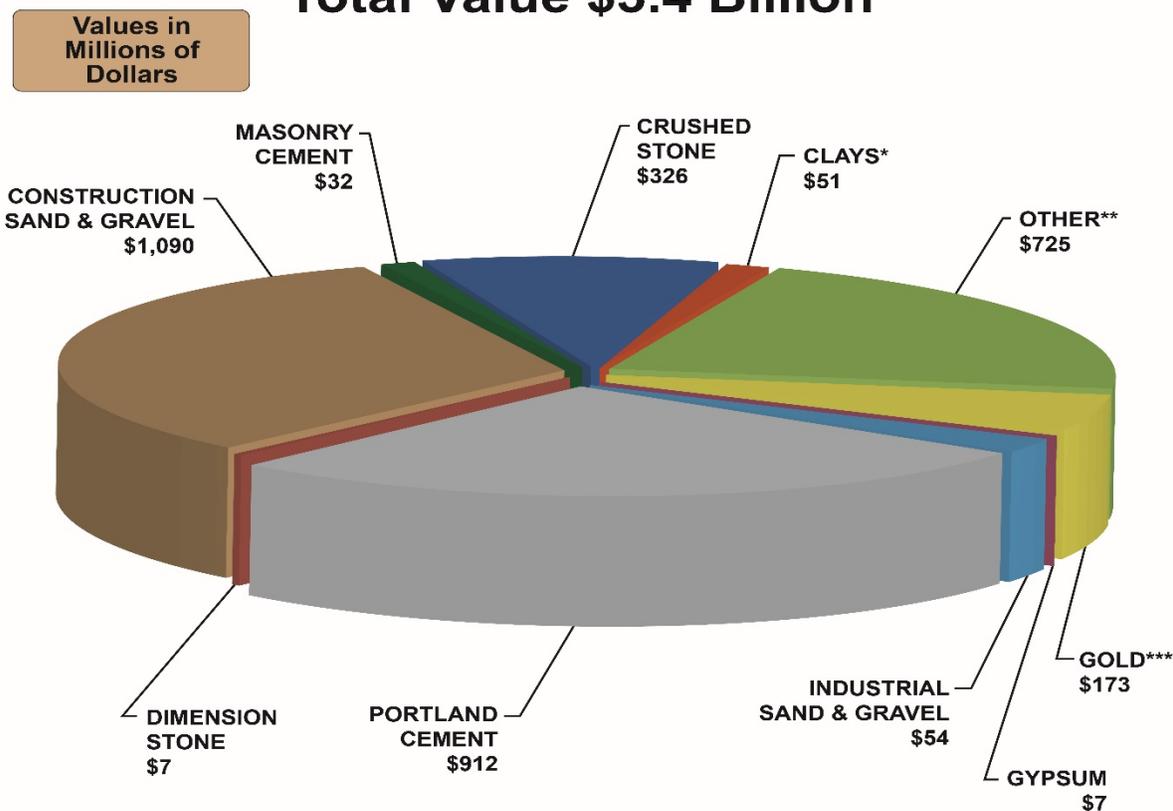
Amount and value of non-fuel mineral production for 2014, 2015, 2016.^{1,2}

Mineral	2014 ^R		2015 ^R		2016 ^P		
	Quantity	Value (thousand \$)	Quantity	Value (thousand \$)	Quantity	Value (thousand \$)	
Boron Minerals	short tons	W	W	W	W	W	
Cement							
Masonry	short tons	205,000	20,100	207,200	20,800	238,100	32,400
Portland	short tons	10,818,000	829,000	10,769,500	887,000	10,637,200	912,000
Clays ⁵	short tons	800,000	41,040	768,300	40,690	774,900	50,840
Gemstones		NA	1,210	NA	882	NA	770
Gold ³	troy ounces	⁴ 144,123	⁴ 183,290	⁴ 160,768	⁴ 187,439	⁴ 138,015	⁴ 172,770
Gypsum (crude)	short tons	795,500	6,030	760,600	5,930	897,300	6,510
Pumice & Pumicite	short tons	67,200	1,580	W	W	W	W
Sand and gravel:							
Construction	short tons	96,010,300	1,010,000	106,923,100	1,090,000	102,073,000	1,090,000
Industrial	short tons	1,675,000	52,500	2,050,300	66,100	1,785,700	54,200
Silver ³	troy ounces	W	W	W	W	W	W
Stone:							
Crushed	short tons	39,462,000	314,000	42,328,320	331,000	39,682,800	326,000
Dimension	short tons	25,000	9,170	23,148	7,780	18,700	6,750
Total combined and W values		₹682,000		₹751,000		725,000	
Total annual value-all minerals		₹3,150,000		₹3,389,000		3,377,000	
<p>¹ Production as measured by mine shipments, sales, or marketable production (including consumption by producers).</p> <p>² Quantities are rounded to the nearest 100 units except for gold and silver. Values are rounded to the nearest \$10,000 and totals to the nearest \$1,000,000.</p> <p>³ Recoverable content of ores, etc.</p> <p>⁴ Data from California Department of Conservation, Division of Mine Reclamation.</p> <p>⁵ Clays includes bentonite, kaolin, common, and montmorillonite (fullers earth).</p> <p>^R Revised from previous non-fuel mineral production report.</p> <p>^P Preliminary.</p> <p>NA = Not available.</p> <p>W = Withheld to avoid disclosing company proprietary data; value included with "combined value" data.</p>							

Modified from unpublished U.S. Geological Survey (USGS) data, subject to change; official USGS final 2016 data will be published in the California chapter of the USGS Mineral Yearbook, Area Reports: Domestic 2016, Volume II.

CALIFORNIA NON-FUEL MINERAL PRODUCTION 2016

Total Value \$3.4 Billion



*CLAYS includes: bentonite, kaolin, common, and montmorillonite (fullers earth)

**OTHER includes: boron, diatomite, feldspar, gemstones, lime, magnesium compounds, pumice, pumicite, salt, silver, soda ash, and zeolites

***Data from the California Division of Mine Reclamation

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