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2006 Minerals Yearbook

OKLAHOMA

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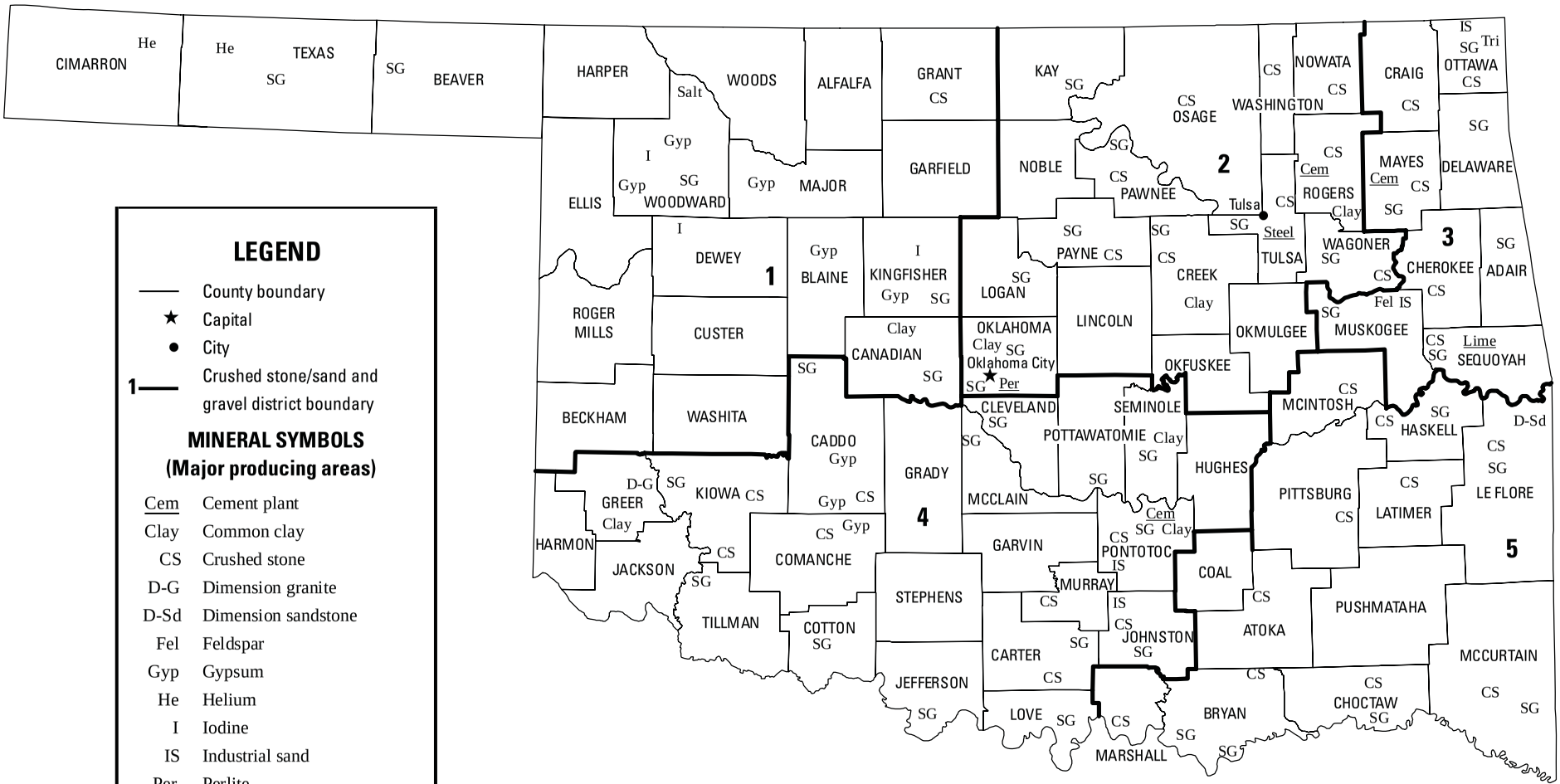
OKLAHOMA



Source: Oklahoma Geological Survey/U.S. Geological Survey (2006).

The Mineral Industry of Oklahoma

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

In 2006, Oklahoma's nonfuel raw mineral production[1] was valued at $684 million, based upon annual U.S. Geological Survey (USGS) data. This was a $66 million, or 10.7%, increase from the State's total nonfuel mineral value for 2005, which then had increased by $99 million, or 19%, from 2004 to 2005. The State was 32d in rank among the 50 States in total nonfuel mineral production value, accounting for more than 1% of the U.S. total value.

In 2006, crushed stone continued to be Oklahoma's leading nonfuel mineral commodity, based upon value, accounting for more than 37% of the State's total nonfuel mineral production value. Crushed stone was followed by cement (portland and masonry), construction sand and gravel, industrial sand and gravel, iodine, and gypsum (descending order of value). The combined values of three of Oklahoma's four major construction materials—crushed stone, construction sand and gravel, and gypsum (descending order of value)—accounted for about 55% of the State's total value. (Data for portland cement were withheld—company proprietary data.)

Most of Oklahoma's increase in value in 2006 resulted from increases in the values, in descending order of change, of construction sand and gravel, crude iodine, cement (masonry and portland), crude gypsum, and industrial sand and gravel, which rose, respectively, by nearly $27 million, by more than $20 million, by more than $10 million, by $9 million, and by nearly $7 million. The unit values of each of these nonfuel mineral commodities also increased, the increase in that of crude iodine being by far the largest, followed by that of cement, construction sand and gravel, industrial sand and gravel, and crude gypsum (in descending order of increase). Relatively few mineral commodities had decreases in value, the largest of which was in that of crushed stone, down by $14 million. Although small in comparison to most of the State's other mineral commodities, the value of gemstones continued its rebound in 2006. The commodity's value rose to $106,000 in 2006 from $43,000 in 2005 after dropping to an uncharacteristic low of $4,000 in 2004 (table 1). In recent years, the total value of gemstones production typically has ranged from $200,000 to more than $300,000, annually; a high of more than $600,000 was reached in 1996.

Oklahoma's mines exclusively produced industrial minerals; no metals were mined in the State. In 2006, Oklahoma continued to be the only State that produced iodine and it continued to be first in the quantities of crude gypsum produced. The State also remained second of 4 States that produce tripoli and fourth in the production of feldspar. Oklahoma rose to 5th from 7th in industrial sand and gravel production, to 6th from 11th in common clays, and to 10th from 12th in the production of masonry cement. Additionally, the State continued to be a significant producer of crushed stone, portland cement, and construction sand and gravel (descending order of value).

The narrative information that follows was provided by the Oklahoma Geological Survey[2] (OGS). Production data in the text that follow are those reported by the OGS based upon that agency's own surveys and estimates. Data may differ from some production figures or other data as reported to the USGS.

Mining Employment

The Oklahoma Department of Mines (ODOM) recorded nonfuel minerals production from 422 mines in the State during 2006, from a total of 549 permitted mining sites on file. Most of the producing mines were open pit mines. Exceptions were brine wells from which iodine and salt were produced, natural gas wells from which helium was produced, and one underground mine from which limestone was produced. Operators of 366 mines within the nonfuel mining industry directly employed 31,684 persons in 2006, excluding those employed by iodine and helium operators.

Commodity Review

Industrial Minerals

Clays.—Boral Bricks Inc. held grand opening ceremonies in March at its newly constructed brick plant in Union City (Boral Bricks Inc., 2006). Construction of the new plant was completed in late 2005, with initial production of brick beginning in January 2006. The production capacity of 100 million bricks per year at this 15,300-square-meter facility effectively increased Boral's brick manufacturing capacity by 6% in the United States. As part of an overall sustainability plan for the operation of the plant, methane gas generated from a landfill located near the plant was used as a fuel for the brick kilns, supplementing the natural gas supplied through the local utility company. The Boral plant, which employs about 50 people, supplies bricks to customers in Arkansas, Oklahoma, and Texas.

During the year, Boral conducted various product development activities with emphasis on the production of desired brick colors and textures. Conclusions from product development tests indicated that the Permian Dog Creek Shale, the clay deposit mined for making the brick, did not require the

[1]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 2006 USGS mineral production data published in this chapter are those available as of March 2008. All USGS Mineral Industry Surveys and USGS Minerals Yearbook chapters—mineral commodity, State, and country—can be accessed over the Internet at URL http://minerals.usgs.gov/minerals.

[2]Stanley T. Krukowski, Industrial Minerals Geologist IV with the Oklahoma Geological Survey, authored the text of the State mineral industry information provided by that agency.

addition of grog in the brick manufacturing process. Elimination of the use grog was advantageous in that an appropriate source of grog was not available near the brick production plant. Grog, a nonplastic, crushed-fired brick waste, is used to enhance certain brick properties or facilitate a processing step, such as drying the clay, particularly when using more highly plastic clays. The Dog Creek material is a reddish-brown to orange-brown shale with thin interbedded siltstones and fine-grained sandstones.

Sand and Gravel.—Dolese Bros. Co. completed construction of its sand production plant on the Canadian River 8 kilometers south of Mustang. The Canadian River, along with its tributaries, makes up approximately 30% of the Arkansas River drainage basin. Erosion of various rocks along the river in New Mexico, the north Texas panhandle, and western Oklahoma contribute to the alluvial deposits dredged at the plant site. Various types of sand and gravel including, but not restricted to, concrete sand, fill sand, pea gravel, and larger gravel were produced at the plant. It was anticipated that total plant production would reach a rate of approximately 540 metric tons per hour.

Stone, Crushed.—Meridian Aggregates (a wholly owned subsidiary of Martin Marietta Materials, Inc.) began aggregates production at its 280-hectare (ha), North Troy quarry near Mill Creek in Johnston County. An agreement with the Oklahoma Water Resources Board (OWRB) allowed the company to drill a new water well that would draw 173 hectare-meters per year of water. The water was to be used to wash aggregate material that was extracted from the quarry. Development of the quarry operation had been postponed as a result of environmental concerns presented by local residents on the effects the water usage from the well would have on nearby springs and streams. In order to appropriately monitor the effects of the water usage, Meridian established a water monitoring and management plan with the U.S. National Park Service and the U.S. Fish and Wildlife Service.

Upon completion of the drilling of the well to a depth of 325 meters in August, Meridian began its monitoring and management plan for the well and surrounding springs. Part of the plan called for Meridian to monitor ground water and surface water in the quarry's vicinity. The plan also included monitoring the water levels in six wells, and the volume of flow in two nearby streams. Meridian, under an agreement with the USGS and the OWRB, installed continuous water-level recorders in three wells maintained by the OWRB. Water-level recorders also were installed in two wells maintained by the USGS and one maintained by Meridian, the latter located near the quarry. Funded by Meridian, the USGS installed two new water-flow gages at points on each of the two streams where the OWRB previously had monitoring stations. The OWRB hoped that the new data collected would supply additional information for a better understanding of the nature of the aquifer.

Legislation and Government Programs

The U.S. Environmental Protection Agency (EPA) proposed new criteria for the use of chat in highway and other transportation construction projects, and in nontransportation/nonresidential concrete and construction projects. Chat refers to the dolomite, limestone, and siliceous rock fragments rejected in lead-zinc milling operations in the Tri-State Mining District of northeastern Oklahoma (Tar Creek) in Ottawa County. Additional information on the Tar Creek Superfund Site and the use of chat can be accessed at http://cfpub1.epa.gov/supercpad/cursites/csitinfo.cfm?id=0601269. Lead and zinc were produced in the Tri State Mining District beginning in the 19th century until the mid-20th century. The chat is stockpiled at the former mill sites and has been utilized for decades as aggregate material in railroad ballast, highway construction, and concrete production. According to the EPA, the beneficial use of chat "will reduce the current health and environmental hazards posed by existing surface-level chat piles." About 91 million metric tons of chat is contained in mine waste stockpiles in the Tri-State District, which covers approximately 6,500 square kilometers in Kansas, Missouri, and Oklahoma (Environmental Protection News, 2006).

The Wildlife Habitat Council, at its 2005 Annual Symposium, recognized the Lafarge North America cement plant in Tulsa, along with 143 other sites, for its contributions to wildlife habitat conservation and biodiversity. The plant had set aside about 10% of its 530-ha property for wildlife habitat enhancement projects, which included several ponds, wetlands, and grasslands. Habitat enhancement projects were conducted on about 8 ha of the property. The project area shares a common border with the Redbud Valley Nature Preserve, allowing the two organizations to benefit from each other's mutual goals.

References Cited

Boral Bricks Inc., 2006, It's official: Boral Bricks Inc. news release, April 6, 1 p. (Accessed September 19, 2008, at http://www.boralbricks.com/News/NewsDetail.aspx?nid=48.)

Environmental Protection News, 2006, EPA proposes criteria for using chat from Tar Creek (Okla.), other areas: Environmental Protection News, March 1, 1 p. (Accessed September 23, 2008, at http://www.eponline.com/articles/53959/.)

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN OKLAHOMA[1, 2]

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral		2004		2005		2006	
		Quantity	Value	Quantity	Value	Quantity	Value
Clays, common		1,150	2,410	903	2,520	1,180	4,700
Gemstones, natural		NA	4	NA	43	NA	106
Gypsum, crude		3,250	20,800	2,620	18,400	3,860	27,400
Iodine, crude	metric tons	1,130	W	1,570	W	W	W
Sand and gravel:							
Construction		12,000	53,700	13,300	65,000	17,000	91,900
Industrial		1,390	31,600	1,480	33,500	1,640	40,400
Stone:							
Crushed		39,800	206,000	47,300 r	269,000 r	43,300	255,000
Dimension		17	2,100	3	501	3	502
Tripoli	metric tons	32,100	2,120	30,600	1,950	18,400	1,890
Combined values of cement, feldspar, helium (Grade-A), lime, salt, and values indicated by the symbol W		XX	199,000	XX	227,000	XX	263,000
Total		XX	519,000	XX	618,000 r	XX	684,000

rRevised. NA Not available. W Withheld to avoid disclosing company proprietary data. Withheld values included in "Combined values" data.
XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 2
OKLAHOMA: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	2005			2006		
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Number of quarries	Quantity (thousand metric tons)	Value (thousands)
Limestone[2]	48 r	41,200 r	$231,000 r	45	38,000	$224,000
Granite	4	3,740	23,900	4	2,840	16,600
Sandstone and quartzite	6 r	1,190 r	6,760 r	5	850	5,050
Miscellaneous stone	9 r	1,150 r	6,460 r	8	1,590	8,840
Total	XX	47,300 r	269,000 r	XX	43,300	255,000

rRevised. XX Not applicable.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Includes limestone-dolomite reported with no distinction between the two.

TABLE 3
OKLAHOMA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2006, BY USE[1]

(Thousand metric tons and thousand dollars)

Use	Quantity	Value
Construction:		
Coarse aggregate (+1½ inch):		
Riprap and jetty stone	116	1,120
Filter stone	52	377
Other coarse aggregate	5	30
Total	173	1,530
Coarse aggregate, graded:		
Concrete aggregate, coarse	1,980	13,800
Bituminous aggregate, coarse	462	2,690
Bituminous surface-treatment aggregate	W	W
Railroad ballast	W	W
Other graded coarse aggregate	4,060	21,000
Total	6,990	41,600
Fine aggregate (-⅜ inch):		
Stone sand, concrete	W	W
Stone sand, bituminous mix or seal	W	W
Screening, undesignated	1,000	4,880
Other fine aggregate	10	33
Total	1,350	6,270
Coarse and fine aggregates:		
Graded road base or subbase	2,440	14,100
Unpaved road surfacing	W	W
Terrazzo and exposed aggregate	W	W
Crusher run or fill or waste	1,500	9,280
Total	4,000	23,800
Agricultural, limestone	(2)	(2)
Chemical and metallurgical, cement manufacture	(2)	(2)
Other miscellaneous uses and specified uses not listed	(2)	(2)
Unspecified:[3]		
Reported	22,000	130,000
Estimated	6,600	39,000
Total	28,600	169,000
Grand total	43,300	255,000

W Withheld to avoid disclosing company proprietary data; included in "Total."
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Withheld to avoid disclosing company proprietary data; included in "Grand total."
[3]Reported and estimated production without a breakdown by end use.

TABLE 4

OKLAHOMA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2006, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	Districts 1 and 2[2]		District 3		District 4	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction:						
Coarse aggregate (+1½ inch)[3]	W	W	W	W	--	--
Coarse aggregate, graded[4]	2,600	18,600	W	W	W	W
Fine aggregate (-⅜ inch)[5]	W	W	W	W	--	--
Coarse and fine aggregate[6]	3,090	18,400	268	1,650	--	--
Agricultural[7]	W	W	W	W	--	--
Chemical and metallurgical[8]	--	--	W	W	W	W
Other miscellaneous uses and specified uses not listed	--	--	W	W	--	--
Unspecified:[9]						
Reported	2,000	11,900	772	4,580	14,100	83,100
Estimated	--	--	2,400	14,000	670	4,000
Total	9,000	55,400	4,820	31,700	19,700	110,000

	District 5	
	Quantity	Value
Construction:		
Coarse aggregate (+1½ inch)[3]	W	W
Coarse aggregate, graded[4]	W	W
Fine aggregate (-⅜ inch)[5]	W	W
Coarse and fine aggregate[6]	639	3,810
Agricultural[7]	W	W
Chemical and metallurgical[8]	--	--
Other miscellaneous uses and specified uses not listed	--	--
Unspecified:[9]		
Reported	5,180	30,400
Estimated	3,500	21,000
Total	9,760	57,400

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

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Districts 1 and 2 are combined to avoid disclosing company proprietary data.

[3]Includes filter stone, riprap and jetty stone, and other coarse aggregate.

[4]Includes bituminous aggregate (coarse), bituminous surface-treatment aggregate, concrete aggregate (coarse), railroad ballast, and other graded coarse aggregate.

[5]Includes screening (undesignated), stone sand (bituminous mix or seal), stone sand (concrete), and other fine aggregate.

[6]Includes crusher run or fill or waste, graded road base or subbase, terrazzo and exposed aggregate, and unpaved road surfacing.

[7]Includes agricultural limestone.

[8]Includes cement manufacture.

[9]Reported and estimated production without a breakdown by end use.

TABLE 5
OKLAHOMA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2006,
BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate and concrete products	3,070	$18,000	$5.86
Plaster and gunite sands	102	669	6.57
Asphaltic concrete aggregates and other bituminous mixtures	764	4,500	5.89
Road base and coverings	743	2,650	3.57
Fill[2]	1,970	8,700	4.41
Other miscellaneous uses[3]	15	426	28.40
Unspecified:[4]			
Reported	4,490	25,500	5.69
Estimated	5,830	31,400	5.39
Total or average	17,000	91,900	5.41

[1]Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.
[2]Includes filtration.
[3]Includes snow and ice control.
[4]Reported and estimated production without a breakdown by end use.

TABLE 6
OKLAHOMA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2006,
BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

	District 1		District 2		District 3	
Use	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregates and concrete products[2]	159	937	1,600	8,920	W	W
Asphaltic concrete aggregates and road base materials	294	815	W	W	W	W
Fill	169	269	734	4,520	W	W
Other miscellaneous uses[3]	--	--	360	2,700	2,010	11,700
Unspecified:[4]						
Reported	797	4,920	762	4,380	W	W
Estimated	261	1,410	1,910	10,300	421	2,210
Total	1,680	8,350	5,370	30,800	2,430	13,900

	District 4		District 5	
	Quantity	Value	Quantity	Value
Concrete aggregates and concrete products[2]	863	5,770	W	W
Asphaltic concrete aggregates and road base materials	578	2,490	--	--
Fill	785	1,910	W	W
Other miscellaneous uses[3]	--	--	704	3,750
Unspecified:[4]				
Reported	1,340	7,390	W	W
Estimated	2,420	13,000	820	4,430
Total	5,980	30,600	1,520	8,180

W Withheld to avoid disclosing company proprietary data; included in "Other miscellaneous uses." -- Zero.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes filtration and snow and ice control.
[4]Reported and estimated production without a breakdown by end use.