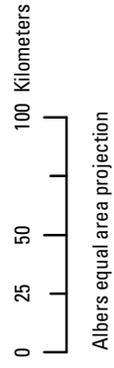
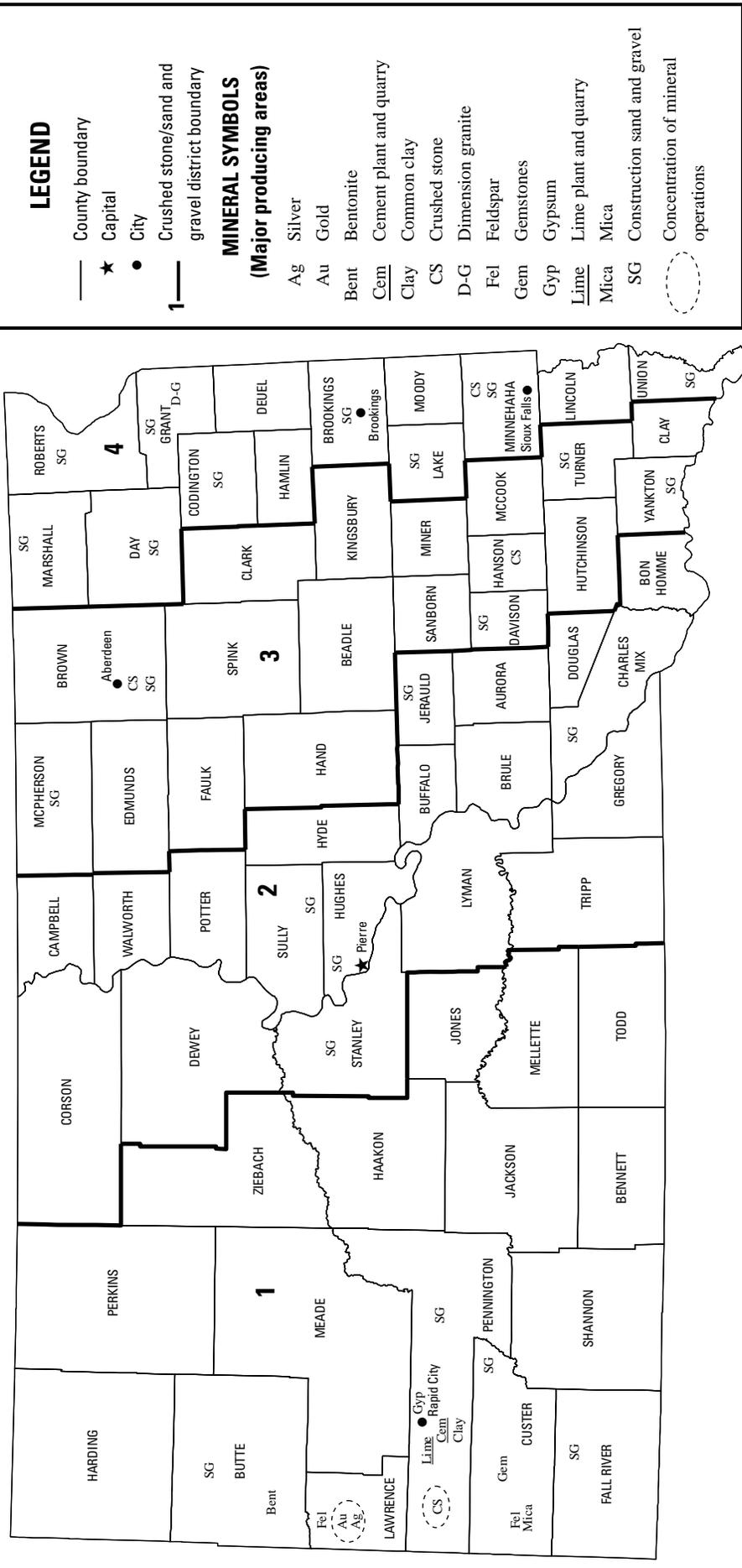




2007 Minerals Yearbook

SOUTH DAKOTA [ADVANCE RELEASE]

SOUTH DAKOTA



Source: South Dakota Geological Survey/U.S. Geological Survey (2007).

THE MINERAL INDUSTRY OF SOUTH DAKOTA

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

In 2007, South Dakota's nonfuel raw mineral production¹ was valued at \$270 million, based upon annual U.S. Geological Survey (USGS) data. This was a \$40 million, or 17.4%, increase from the State's total nonfuel mineral value for 2006, which also had increased by \$13 million from 2005 to 2006. South Dakota ranked 39th among the States in total nonfuel mineral production. On a per-capita-basis, the State ranked 13th in the Nation in the value of its mineral industry's nonfuel mineral production; with a population of slightly more than 796,000, the value of production was about \$338 per capita.

Portland cement production, by value, continued to be South Dakota's leading nonfuel mineral commodity in 2007, after overtaking gold in 2002; prior to 2002, gold had been the State's leading mineral commodity for more than 4 decades. Portland cement was followed (in descending order of value) by construction sand and gravel, crushed stone, gold, granite dimension stone, and lime. The State's production of construction materials, which mainly included (in descending order of value) portland cement, construction sand and gravel, crushed stone, granite dimension stone, common clays, and gypsum, accounted for 80% of the State's total nonfuel mineral production value.

Portland cement and gold had the largest increases in production value of all the State's nonfuel mineral commodities. An approximate 10% increase in portland cement production led to an estimated increase in production value of nearly 20%. With about three times more production in 2007 than in 2006, gold's production value more than tripled in 2007. Also showing a significant increase in value was crushed stone, up by \$3 million, and lime. The largest decrease took place in construction sand and gravel, down by \$9.5 million (table 1).

In 2007, South Dakota continued to rank sixth in the quantity of gold produced of 10 producing States and second of five mica-producing States while remaining a significant producer of construction sand and gravel and granite dimension stone (11th in rank).

The following narrative information was provided by the South Dakota Department of Environment and Natural Resources (DENR)² in cooperation with DENR Geological

¹The 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 2007 USGS mineral production data published in this chapter are those available as of June 2009. All USGS Mineral Industry Surveys and USGS Minerals Yearbook chapters—mineral commodity, State, and country—can be retrieved over the Internet at URL <http://minerals.usgs.gov/minerals>.

²The DENR Minerals and Mining Program in cooperation with DENR Geological Survey Program provided information. E. H. Holm, T. Cline, Jr., and Roberta Fivecoate, Natural Resources Project Engineer, Environmental Project Scientist, and Natural Resources Project Engineer, respectively, with the Minerals and Mining Program, jointly authored the text of information provided by that program.

Survey Program. Production data in the text that follows are those reported by the DENR Minerals and Mining Program (MMP) and are based upon MMP surveys and estimates. Data may differ from some production figures reported to the USGS.

Exploration and Permitting Activities

Gold exploration activities increased in 2007. Two exploration permits were issued to Wharf Resources (U.S.A.), Inc. (a wholly owned subsidiary of Goldcorp Inc.) for gold exploration near its Wharf Mine located 7 kilometers (4 miles) northwest of Lead, SD. The company drilled 133 exploration holes in 2007. The State also received a permit application for gold exploration in Lawrence County from Capella Resources Ltd. The permit is pending State approval. Six principal producers of gold hold 11 mine permits in the State. Wharf Resources, the only gold mine still actively mining in South Dakota, holds four of these permits. No new mine permits were issued to large-scale gold operations in 2007. However, Wharf Resources was granted a permit amendment in August for a 16-hectare (40-acres) expansion of its current mining operation near Lead, SD. The expansion will allow Wharf to continue mining through 2010. The company is also exploring other expansion opportunities near Lead. In July, the National Science Foundation selected the Homestake underground mine in Lead as the site of a deep underground science and engineering laboratory. Crews re-entered the mine in July to begin refurbishing the infrastructure and installed the equipment needed to pump out water that had been filling the mine since it was closed (Harlan, 2007).

Three exploration permits were issued in 2007. Powertech Uranium, Corporation (USA) Inc. was issued a permit for uranium exploration in Fall River and Custer Counties in southwest South Dakota. This was the first uranium exploration permit issued in more than 20 years in South Dakota. Powertech drilled approximately 70 uranium exploration holes in 2007 and plans to conduct additional uranium exploration in 2008. In other exploration activities, GCC Dacotah, Inc. (a subsidiary of Grupo Cementos de Chihuahua de C.V.), the State's sole cement producer, drilled two exploration holes for limestone in Pennington County. One placer gold operation reported exploration activities in Lawrence County.

Commodity Review

Industrial Minerals

There were a total of 501 active mine licenses issued to companies and individuals in 2007. An operator must obtain a license to mine for gravel and to obtain sand and rock to be crushed and used in construction. There are also mine permits that cover mining for bentonite, dimension stone, placer gold, and slate. Besides construction sand and gravel and dimension

stone other minerals produced in smaller amounts during 2007 included agricultural lime, gypsum, iron ore, mica schist, pegmatite minerals (feldspar, mica, rose quartz), placer gold, shale, and slate.

Sand and Gravel, Construction and Stone, Crushed.—Sand and gravel remained the major nonmetallic mineral commodity during 2007, with 13.4 million metric tons (Mt) produced. Sand and gravel is produced in nearly every county and is used mainly for road construction projects. There was 2.9 Mt quartzite produced and quarried from four locations in southeastern South Dakota. Most of the quartzite is crushed and used in construction or for railroad ballast. Some larger blocks were used for riprap and occasionally for decorative purposes.

Stone, Dimension.—A total of 229,000 metric tons (t) of dimension stone was mined by Cold Spring Granite Co. and Dakota Granite Co. from quarries near Milbank in northeastern South Dakota. Owing to its beauty and distinctive red color, the “mahogany” granite is used primarily for building and monument construction. Much of it goes to international markets. Dakota Granite submitted a permit amendment in April 2007 to expand its quarry operations.

Limestone.—Limestone remained the second most prolific nonmetallic mineral commodity produced during 2007, with 3.2 Mt reported. Limestone is produced in the Black Hills of western South Dakota and is used primarily in the production of cement and for construction projects.

Metals

Gold.—Gold remained one of the top leading mineral commodities in South Dakota in terms of value. Gold production decreased slightly in 2007, but the value increased owing to higher gold prices. Wharf Resources produced 1,790 kilograms (kg) of gold in 2007. This represents a slight decrease in the amount of gold produced compared with that of 2006. In 2007, the average price of gold was \$695 per troy ounce, yielding a gross value of about \$40 million, 5% higher than the 2006 gross value of \$38 million. Wharf Resources was also the only

company to report silver production, which is a byproduct of its gold recovery process. About 4,160 kg of silver was recovered in 2007. The average price of silver was about \$13.38 per troy ounce, with a value of slightly less than \$1.8 million in 2007. This is a decrease from the 5,740 kg (184,000 troy ounces) and \$2.13 million reported in 2006.

Environmental Issues

The U.S. Environmental Protection Agency (EPA) continued acid water treatment at the Gilt Edge Mine Superfund Site in 2007. A total of 510 million liters (135 million gallons) of water were treated and discharged in 2007. Water treatment was to continue in 2008. EPA and the State were working on finalizing a feasibility study outlining reclamation options for the site. Owing to growing interest in uranium mining and to prepare for the possibility of uranium in situ leach mining operations moving into South Dakota, the legislature passed a bill authorizing the Board of Minerals and Environment to promulgate rules for the construction, operation, monitoring, and closure of uranium and other in situ leach mines. In January, the board held a public hearing on new in situ leach mining regulations. The hearing was attended by representatives of the uranium mining industry, environmental organizations, and Native American groups. After considering written and oral comments, the board adopted the rules which became effective in July. In August and September, the DENR conducted a final inspection of the Golden Reward Mine near Lead. Wharf Resources, which owns the mine, planned to submit a petition for release of reclamation liability for the mine site in early 2008.

Reference Cited

Harlan, Bill, 2007, Homestake selected as DUSEL by National Science Foundation: Rapid City Journal News Release, July 11. (Accessed July 16, 2009, at http://www.sanfordundergroundlaboratoryathomestake.org/index.php?option=com_content&view=article&id=90:homestake-selected-as-dusel-by-national-science-foundation&catid=21:other-news).

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN SOUTH DAKOTA^{1,2}

(Thousand metric tons and thousand dollars)

Mineral	2005		2006		2007	
	Quantity	Value	Quantity	Value	Quantity	Value
Clays, common	183	W	176	W	151	W
Sand and gravel, construction	12,800	45,500	16,500 ^r	60,000 ^r	13,900	50,500
Stone, crushed	6,740	32,400	6,320	41,400 ^r	5,360	44,500
Combined values of cement (portland), feldspar, gemstones (natural), gold, gypsum (crude), iron ore (usable shipped), lime, mica (crude), stone (dimension granite), and values indicated by symbol W	XX	139,000	XX	129,000	XX	175,000
Total	XX	217,000	XX	230,000 ^r	XX	270,000

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

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

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

TABLE 2
SOUTH DAKOTA: CRUSHED STONE SOLD OR USED, BY KIND¹

Type	2006			2007		
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Number of quarries	Quantity (thousand metric tons)	Value (thousands)
Limestone	4	3,240	\$18,400 ^r	4	3,200	\$22,500
Granite	1	217	1,620	1	190	1,930
Quartzite	3	2,870	21,400 ^r	3	1,970	20,000
Slate	1	(2)	2	1	1	13
Total	XX	6,320	41,400 ^r	XX	5,360	44,500

^rRevised. XX Not applicable.

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

²Less than ½ unit.

TABLE 3
SOUTH DAKOTA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2007, BY USE¹

(Thousand metric tons and thousand dollars)

Use	Quantity	Value
Construction:		
Coarse aggregate (+1½ inch), other	W	W
Coarse aggregate, graded, other	W	W
Fine aggregate (¾ inch), other	W	W
Coarse and fine aggregates, other	W	W
Chemical and metallurgical, cement manufacture	(2)	(2)
Unspecified: ³		
Reported	2,620	16,500
Estimated	2,000	21,000
Total	5,360	44,500

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

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

²Withheld to avoid disclosing company proprietary data; included with "Unspecified: Reported."

³Reported and estimated production without a breakdown by end use.

TABLE 4
SOUTH DAKOTA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2007, BY USE AND DISTRICT^{1,2}

(Thousand metric tons and thousand dollars)

Use	District 1		District 3		District 4	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction:						
Coarse aggregate (+1½ inch) ³	--	--	W	W	--	--
Coarse aggregate, graded ⁴	--	--	W	W	--	--
Fine aggregate (-¾ inch) ⁵	--	--	W	W	--	--
Coarse and fine aggregate ⁶	--	--	W	W	--	--
Chemical and metallurgical ⁷	(8)	(8)	--	--	--	--
Unspecified:⁹						
Reported	1,990	10,200	--	--	627	6,380
Estimated	1,200	12,000	--	--	811	8,300
Total	3,200	22,500	719	7,320	1,440	14,600

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

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

²No production for District 2.

³Includes other coarse aggregate.

⁴Includes other graded coarse aggregate.

⁵Includes other fine aggregate.

⁶Includes other coarse and fine aggregates.

⁷Includes cement manufacture.

⁸Withheld to avoid disclosing company proprietary data; included with "Unspecified: Reported."

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

TABLE 5
SOUTH DAKOTA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2007,
BY MAJOR USE CATEGORY¹

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	1,010	\$4,900	\$4.87
Concrete products (blocks, bricks, pipe, decorative, etc.) ²	71	502	7.07
Asphaltic concrete aggregates and other bituminous mixtures	100	488	4.88
Road base and coverings ³	3,900	12,100	3.10
Fill	176	327	1.86
Snow and ice control	25	80	3.20
Other miscellaneous uses	104	1,070	10.27
Unspecified:⁴			
Reported	958	4,090	4.27
Estimated	7,600	27,000	3.55
Total or average	13,900	50,500	3.62

¹Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.

²Includes plaster and gunite sands.

³Includes road and other stabilization (cement and lime).

⁴Reported and estimated production without a breakdown by end use.

TABLE 6
SOUTH DAKOTA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2007,
BY USE AND DISTRICT¹

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products ²	W	W	W	W	4	70
Asphaltic concrete aggregates and other bituminous mixtures	--	--	16	87	(3)	2
Road base and coverings ⁴	W	W	W	W	515	1,300
Fill	1	10	19	25	15	33
Snow and ice control	(3)	4	7	24	4	20
Other miscellaneous uses ⁵	255	1,060	388	1,570	--	--
Unspecified: ⁶						
Reported	149	658	119	374	35	154
Estimated	3,500	13,000	1,200	4,300	1,300	4,400
Total	3,940	14,400	1,750	6,390	1,850	5,980
	District 4		Unspecified districts			
	Quantity	Value	Quantity	Value		
Concrete aggregate and concrete products ²	891	4,320	--	--		
Asphaltic concrete aggregates and other bituminous mixtures	84	399	--	--		
Road base and coverings ⁴	2,710	8,480	220	727		
Fill	141	259	--	--		
Snow and ice control	9	19	5	13		
Other miscellaneous uses ⁵	100	1,000	--	--		
Unspecified: ⁶						
Reported	655	2,910	--	--		
Estimated	1,600	5,700	--	--		
Total	6,190	23,100	224	740		

W Withheld to avoid disclosing company proprietary data; included in "Other miscellaneous uses." -- Zero.

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

²Includes plaster and gunite sands.

³Less than ½ unit.

⁴Includes road and other stabilization (cement and lime).

⁵Includes snow and ice control.

⁶Reported and estimated production without a breakdown by end use.