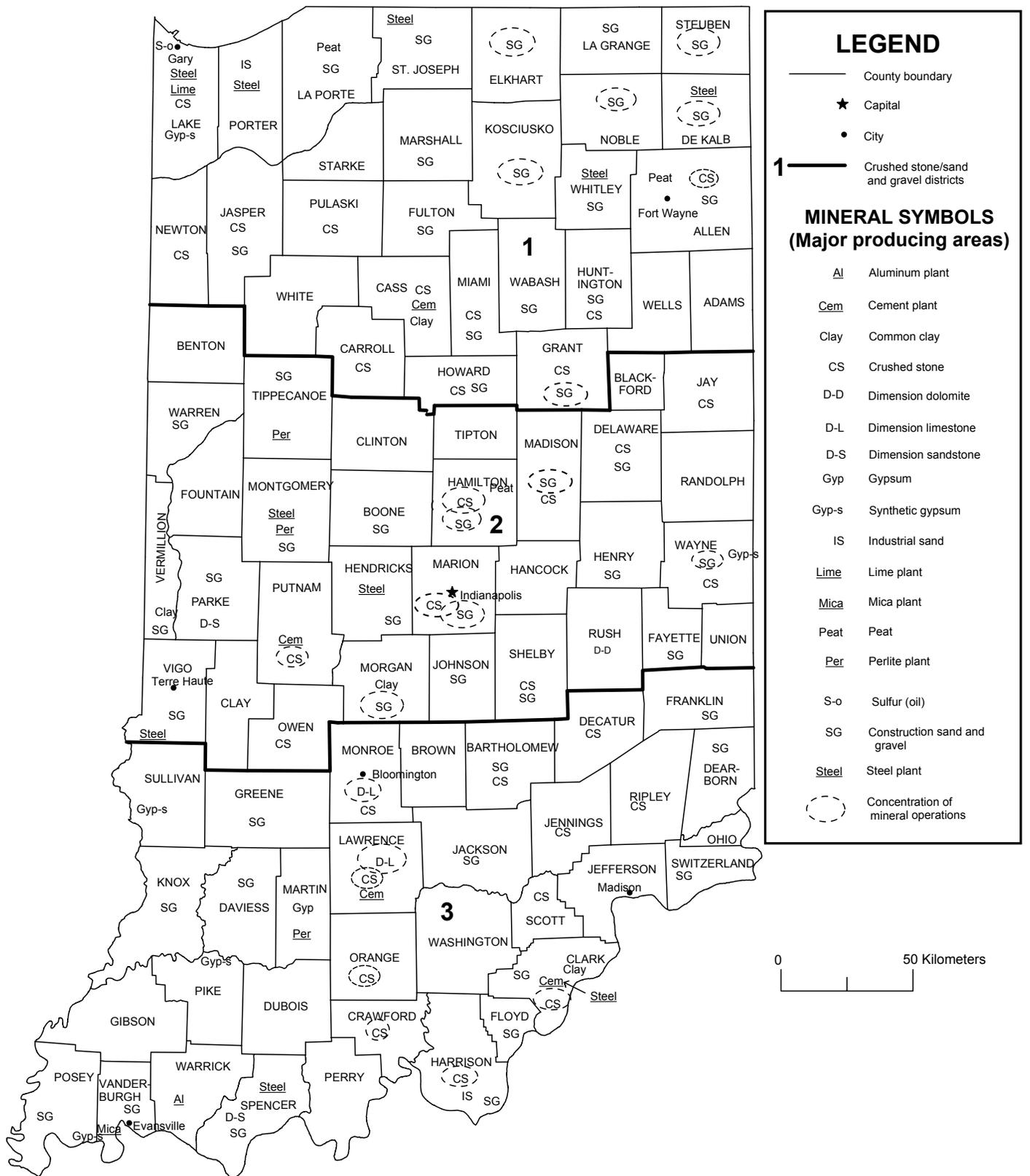


INDIANA



Source: Indiana Geological Survey/U.S. Geological Survey (2003)

THE MINERAL INDUSTRY OF INDIANA

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

In 2003, the estimated value¹ of nonfuel mineral production for Indiana was \$734 million, based upon preliminary U.S. Geological Survey (USGS) data. This was a marginal increase of \$2 million from that of 2002² and followed a similarly small decrease of \$6 million, a less than 1% decrease, from 2001 to 2002. The State, for the third consecutive year, was 18th in rank among the 50 States in total nonfuel raw mineral production value, of which Indiana accounted for nearly 2% of the U.S. total.

In 2003, increases in the estimated values of portland cement (up more than \$10 million) and lime slightly more than offset decreases in the values of crushed stone (down \$6 million), dimension stone (down less than \$2 million), gypsum, construction sand and gravel (down \$1 million), peat, and industrial sand and gravel (descending order of change), resulting in the small net increase for the year. In 2002, Indiana's decrease in nonfuel mineral value resulted mostly from decreases in the production and values of crushed stone (down \$10 million), construction sand and gravel (down \$2 million), and masonry cement. Industrial sand and gravel and peat were down slightly. These were countered, in part, by the rising production and values of dimension stone (up \$4.2 million), portland cement (up \$2 million), and lime (up \$1.5 million), and smaller increases in common clays, gypsum, and gemstones (table 1).

Compared with USGS estimates of the quantities of minerals produced in the other 49 States during 2003, Indiana remained first in dimension stone, fourth in masonry cement, and eighth in portland cement and lime. The State rose to sixth from seventh in gypsum and was a significant producer of crushed stone and construction sand and gravel, ranking 11th and 14th, respectively. The State's mines exclusively produced industrial minerals and coal; all raw steel and primary aluminum produced in the State were processed from materials received from other

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 2003 USGS mineral production data published in this chapter are preliminary estimates as of July 2004 and are expected to change. For some mineral commodities, such as construction sand and gravel, crushed stone, and portland cement, estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Specialist contact information may be retrieved over the Internet at URL <http://minerals.usgs.gov/minerals/contacts/comdir.html>; alternatively, specialists' names and telephone numbers may be obtained by calling USGS information at (703) 648-4000 or by calling the USGS Earth Science Information Center at 1-888-ASK-USGS (275-8747). All USGS Mineral Industry Surveys and USGS Minerals Yearbook chapters—mineral commodity, State, and country—also may be retrieved over the Internet at URL <http://minerals.usgs.gov/minerals>.

²Values, percentage calculations, and rankings for 2002 may differ from the Minerals Yearbook, Area Reports: Domestic 2002, Volume II, owing to the revision of preliminary 2002 to final 2002 data. Data for 2003 are preliminary and are expected to change; related rankings also may change.

domestic and foreign sources. Indiana continued to lead the Nation in the production of raw steel, with an estimated output of about 20.3 million metric tons of raw steel, as reported by the American Iron and Steel Institute (American Iron and Steel Institute, 2004, p. 76). Based upon USGS annual data, the State rose to third from fourth in the production of primary aluminum.

The following narrative information was provided by the Indiana Geological Survey³ (IGS).

Employment

Approximately 3,530 individuals were employed in the Indiana nonfuel sector during 2003; this represents a decrease of 1.8% from 2002 employment figures, according to preliminary data released by the United States Department of Labor, Mine Safety and Health Administration (MSHA).

Commodity Review

Industrial Minerals

Cement.—Lone Star Industries, Inc. is now part of Buzzi Unicem USA. The company operates a plant in Putnam County. The Lehigh Portland Cement Company in Mitchell, Lawrence County, received the Portland Cement Association 2002 Innovations in Safety Award in the quarry division for developing a retractable platform that allows employees to safely clean control room windows of the primary crusher. Lehigh's old, closed Portland Cement Company's Buffington Station Plant in Lake County will be used, along with other lakefront property, for a large development project to include a marina, hotel, convention center, and an outdoor amphitheater.

Crushed Stone.—No new crushed stone quarries opened in Indiana during 2003. The Corydon Crushed Lime Company, Harrison County, was acquired by Sellersburg Stone Co., which operates another quarry in Clark County. No crushed stone quarries closed during 2003, but the Rogers Group, Inc. listed the Orleans Quarry in Orange County, which had not produced for more than 2 years, as abandoned with MSHA. Hanson donated 182 hectares including abandoned rock quarries and wooded areas valued at \$5 million to DePauw University near Greencastle in Putnam County. It will become the DePauw University Nature Park, and rock climbing may be allowed on the quarry walls. Shatter cones from Rogers Group, Inc., Newton County Quarry, the site of an ancient meteorite impact, are on display at the Griffith Observatory in Los Angeles, CA.

³Kathryn R. Shaffer, Minerals Statistician, authored the text of State mineral industry information provided by the Indiana Geological Survey.

During 2003, a National Stone, Sand and Gravel Association's About Face Bronze Medallion Community Relations Award was awarded to Rogers Group, Inc.'s Bloomington Crushed Stone plant in Monroe County. Mulzer Crushed Stone, Inc.'s Newburgh sales yard in Warrick County won a Showplace Award in that competition.

Dimension Stone.—Mansfield Stone, Inc., which operates a sandstone quarry in Parke County, is reopening the St. Meinrad sandstone quarry in Spencer County. A partnership was formed with the monastery that owns the property; the company that will operate the quarry is Mansfield-St. Meinrad Stone, Inc. While the stone will be marketed worldwide, it will also be used to maintain the monastery. The company will not be allowed to blast and must remove the stone by mechanical means. Once quarried, the stone will be trucked to Brazil in Clay County, a 200-kilometer trip, for milling. Initial jobs will focus on the restoration of buildings that had been constructed with the sandstone.

The Indiana Limestone Company, Inc., which owns quarries in Lawrence and Monroe Counties, was sold to Johnson Ventures. Members of a family who own the Victor Oolitic Stone Company in Monroe County opened Big Creek Stone Quarry under the company name Big Creek LLC at a long-abandoned quarry near Stinesville in Monroe County. The Hoosier Calcium Corp., also near Stinesville in Monroe County, was sold to American Limestone, LLC. Hoosier Calcium Corp. had operated as an underground crushed stone quarry that produced crushed limestone for glass manufacture. American Limestone, LLC, however, is producing dimension limestone from a surface mine on the property. The company will be opening another dimension limestone quarry in Monroe County at the site of a quarry that has been abandoned for 75 years. American Limestone, LLC is a spinoff of Mansfield Stone, Inc. Walton Quarries is no longer producing dimension limestone from the C&H Quarry in Monroe County.

Sand and Gravel.—Six new sand and gravel plants opened in 2003, and three additional operations received MSHA identification numbers, but had not started production by the end of the year. Two of the new operations in production are the Stone Street Quarries, Inc., Garrett Plant, in De Kalb County and the Old Prairie Products, Inc., Angola Plant in Steuben County. Other counties with new or planned operations include Delaware, Elkhart, Gibson, Miami, Morgan, and another plant in Steuben County.

Eleven sand and gravel pits closed during 2003. Significant among these were Kirk Materials in De Kalb County; Merritt Sand & Gravel, Inc.; Kimmell Sand and Gravel Plant in Noble County; and Northeast Indiana Sand & Gravel Company LLC, Plants 1 and 2, both in Whitley County.

Three of S.E. Johnson's Indiana-based Stoneco, Inc. quarries and a sand and gravel operation run by S.E. Johnson's London Aggregates were acquired by Oldcastle Materials, Inc., which, in turn, completed an asset exchange with The North American Division of Hanson PLC. Through the arrangement, two of the quarries recently acquired from Stoneco, Inc.—the Fort Wayne Quarry in Allen County and the Milner Quarry in Miami County—and the London Aggregates Angola Plant located in Steuben County were traded to Hanson PLC for seven out-of-

State properties. The remaining Stoneco, Inc. Indiana property, the Bryant Quarry in Adams County, is currently inactive and will be held by S.E. Johnson for reserves. The Fort Wayne property is very near an existing Hanson operation.

Martin Marietta Aggregates continued efforts to expand its Carmel Sand & Gravel operation north of 106th Street in Carmel on the north side of Indianapolis in Marion County into an area near expensive residences and businesses. The City of Carmel passed an ordinance to regulate mining that would prevent the expansion. The ordinance was in litigation at yearend.

Metals

Steel.—The Steel 201 Safeguard program of protective tariffs ended in December, but the program allowed time for future restructuring, consolidation, and other improvements that might strengthen the domestic steel industry. International Steel Group (ISG) acquired Bethlehem Steel Corp. for \$1.5 billion (International Steel Group, 2003). Bethlehem had been in bankruptcy proceedings. The deal included the Burns Harbor mill in Porter County. This acquisition makes ISG the largest North American steel producer. ISG purchased the LTV Corp. last year. Some job cuts occurred, and further production-process consolidation between plants was possible. Bethlehem Steel Corp. would have been 100 years old in 2004. ISG sold its half of BethNova Tube, LLC, part of the Bethlehem Steel Corporation acquisition, to Novamerican Steel Inc., which already owned the other half of the company. The BethNova Tube, LLC plant is in Jeffersonville in Clark County.

U.S. Steel Corp. purchased National Steel Corp., which had been in bankruptcy proceedings, for \$750 million plus \$200 million in liabilities. Included in the deal was a mill in Porter County. U.S. Steel's production is expected to increase by about 40% with the acquisition, making the company the fifth largest steel producer in the world; some jobs were eliminated because of the acquisition. U.S. Steel Corp. exchanged its Gary Works steelplate production facilities for ISG's East Chicago pickle line; both are in Lake County. Production stopped at the Gary Works while repairs were made. That event and the National Steel Corp. assimilation process contributed to decreased U.S. Steel earnings during the last part of the year.

Steel Dynamics purchased GalvPro, a galvanized steel plant that started in 1999 as a partnership between Weirton Steel and the Corus Group. The GalvPro plant, located in Jeffersonville, Clark County, had been in bankruptcy since 2001. Steel Dynamics ramped up production at that facility and began gaining entrance to new markets. The bankrupt Qualitech Steel mill at Pittsboro in Hendricks County was acquired last year and will become the Bar Products Division of Steel Dynamics. The mill began undergoing necessary conversion in the last half of 2003; startup should occur in early 2004. In Whitley County, Steel Dynamics restarted its Iron Dynamics operation producing a substitute pig iron product. Steel Dynamics also announced that its new structural steel mill at Columbia City in Whitley County continued to show improved shipments and profitability. Steel Dynamics began reaching out to new markets with sales of painted products and also with rails for railroad companies.

Ispat International N.V. and Nippon Steel Corp. signed a new Memorandum of Understanding to produce lighter weight steel products for the automotive industry. The two companies already co-own I/N Tek, a continuous cold-rolling mill, and I/N Kote, a hot-dip and electrogalvanizing mill; both mills are near New Carlisle in St. Joseph County. Ispat Inland, Lake County, completed relining and upgrading one of its blast furnaces. Furnace production could increase by 700,000 metric tons per year, and coal use is also expected to increase.

Nucor Corporation set company production records in 2003. The company's new Castrip facility in Crawfordsville in Montgomery County continued to operate and to contribute to the company's success.

Environmental Issues

The Indiana State legislature passed legislation that makes some revisions to the handling of environmental permits and permit fees and requires that regulations more stringent than those provided by the Federal government must be justified.

A project called Hyperfix was conducted to resurface a stretch of I-65/I-70 east of Indianapolis utilizing a hydrodemolition method that used high-powered water (20,000 pounds per square inch) to remove the old concrete. Only 50 of these units are used in the United States and, while more expensive, the process is much quicker and more environmentally friendly than traditional methods. The innovative project, completed on time and within budget, received the Strive for Excellence Team Award from the Federal Highway Administration (FHWA).

A National Stone, Sand & Gravel Association Environmental Eagle Award was awarded to the Vulcan Materials Company's Francesville crushed stone plant in Pulaski County.

Government Programs

Governor O'Bannon announced a 600-meter-wide corridor, designated as route 3-C, for the proposed \$1.7 billion I-69 extension between Indianapolis and Evansville. An exact route will be selected within that corridor, but S.R. 37 will be used between Indianapolis and Bloomington. A combination of existing roads and new terrain highway will complete the route to Evansville. When construction begins, it could take from 8 to 14 years to complete the highway with 80% of the cost expected to come from Federal funding and the remaining 20% from the State. A final environmental impact statement for the project was released, but FHWA approval had not been received by the

yearend. If approved, the State will have \$55 million in Federal funds available to proceed with detailed environmental studies to select a final route and to begin designing the highway. For that phase of the work, the corridor would be divided into six sections. Aerial surveying of the corridor began.

The State plans to complete the final portion of the four-lane Indiana Heartland Highway with a \$220 million extension that will connect Lafayette in Tippecanoe County and Logansport in Cass County. The entire length of highway will stretch from Lafayette to Fort Wayne in Allen County.

The Federal Highway Administration approved plans to build two bridges across the Ohio River between Louisville, KY, and southern Indiana. The so-called "Spaghetti Junction" of interstates in Louisville will also be rebuilt. Estimated date for completion of the projects is between 2017 and 2020.

The USGS-funded STATEMAP projects continued at the IGS. Several publications of interest to the mining industry were published by the IGS in 2003 including a digital atlas of the hydrogeology of Marion County (Brown and Laudick, 2003), geologic maps showing glacial geology (Brown, 2003; Brown and others, 2003), a report on the cause and remediation of pad marks on Indiana Limestone (Hill and Ennis, 2003), and a grain size and color chart (Indiana Geological Survey, 2003). Industry news, reported on a quarterly basis, can be found on the IGS Web site at <http://igs.indiana.edu/geology/minres/m&findustry/>.

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

(Thousand metric tons and thousand dollars)

Mineral	2001		2002		2003 ^p	
	Quantity	Value	Quantity	Value	Quantity	Value
Cement, portland	2,900	195,000 ^e	2,940	197,000 ^e	2,950	207,000 ^e
Clays, common	575	1,470	438	1,860	438	1,860
Gemstones	NA	3	NA	4	NA	4
Sand and gravel, construction	29,000	124,000	27,600	122,000	27,100	121,000
Stone:						
Crushed	58,200	278,000	55,500	268,000	53,500	262,000
Dimension	184	35,300	237	39,500	257	37,800
Combined values of cement (masonry), gypsum (crude), lime, peat, sand and gravel (industrial)	XX	104,000	XX	104,000	XX	104,000
Total	XX	738,000	XX	732,000	XX	734,000

^eEstimated. ^pPreliminary. NA Not available. XX Not applicable.

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

²Data are rounded to three significant digits; may not add to totals shown.

TABLE 2
INDIANA: CRUSHED STONE SOLD OR USED, BY KIND¹

Kind	2001				2002			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone ²	68 ^r	48,900 ^r	\$235,000 ^r	\$4.80 ^r	70	46,500	\$226,000	\$4.87
Dolomite	16 ^r	W	W	4.59	16	W	W	4.62
Slate	1	W	W	6.06	1	W	W	6.06
Total or average	XX	58,200	278,000	4.77	XX	55,500	268,000	4.83

¹Revised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.

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

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

TABLE 3
INDIANA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2002, BY USE¹

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Construction:			
Coarse aggregate (+1 1/2 inch):			
Macadam	70	\$444	\$6.34
Riprap and jetty stone	326	1,960	6.02
Filter stone	W	W	4.96
Other coarse aggregates	1,160	5,010	4.32
Total or average	1,550	7,410	4.77
Coarse aggregate, graded:			
Concrete aggregate, coarse	1,530	7,450	4.88
Bituminous aggregate, coarse	750	5,040	6.71
Bituminous surface-treatment aggregate	322	1,680	5.23
Railroad ballast	282	1,420	5.02
Other graded coarse aggregates	5,250	26,600	5.05
Total or average	8,140	42,100	5.18
Fine aggregate (-3/8 inch):			
Stone sand, concrete	75	471	6.28
Stone sand, bituminous mix or seal	135	717	5.31
Screening, undesignated	109	509	4.67
Other fine aggregates	1,370	5,970	4.35
Total or average	1,690	7,660	4.53
Coarse and fine aggregates:			
Graded road base or subbase	3,350	15,800	4.73
Unpaved road surfacing	798	3,960	4.96
Crusher run or fill or waste	358	1,570	4.39
Other coarse and fine aggregates	4,900	22,700	4.63
Total or average	9,410	44,000	4.68
Other construction materials	116	595	5.13
Agricultural:			
Limestone	1,160	5,650	4.88
Poultry grit and mineral food	(2)	(2)	3.51
Chemical and metallurgical:			
Cement manufacture	4,540	19,889	4.38
Flux stone	(2)	(2)	4.74
Sulfur oxide removal	1,510	6,470	4.27
Special, whitening or whitening substitute	(2)	(2)	4.16
Other miscellaneous uses and specified uses not listed	177	909	5.14
Unspecified:³			
Reported	22,300	111,000	5.00
Estimated	4,700	21,000	4.51
Total or average	27,100	133,000	4.91
Grand total or average	55,500	268,000	4.83

W Withheld to avoid disclosing company proprietary data; included with "Other."

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

²Withheld to avoid disclosing company proprietary data; included in "Grand total."

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

TABLE 4
INDIANA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2002, BY USE AND DISTRICT¹

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction:						
Coarse aggregate (+1 1/2 inch) ²	171	970	113	700	1,270	5,740
Coarse aggregate, graded ³	1,380	7,380	1,540	7,790	5,220	27,000
Fine aggregate (-3/8 inch) ⁴	W	W	W	W	1,350	5,900
Coarse and fine aggregates ⁵	5,060	21,900	W	W	W	W
Other construction materials	--	--	25	195	91	400
Agricultural ⁶	703	3,270	120	606	512	2,400
Chemical and metallurgical ⁷	W	W	1,660	6,390	3,770	17,500
Special ⁸	--	--	--	--	W	W
Other miscellaneous uses	--	--	--	--	177	909
Unspecified: ⁹						
Reported	5,980	30,300	9,800	51,200	6,530	30,000
Estimated	1,200	5,600	490	2,200	3,000	14,000
Total	15,300	72,600	16,000	81,000	24,300	115,000

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.

²Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregates.

³Includes bituminous aggregate (coarse), bituminous surface-treatment aggregate, concrete aggregate (coarse), railroad ballast, and graded coarse aggregates.

⁴Includes stone sand (bituminous mix or seal), stone sand (concrete), screening (undesigned), and other fine aggregates.

⁵Includes crusher run or fill or waste, graded road base or subbase, unpaved road surfacing, and other coarse and fine aggregates.

⁶Includes agricultural limestone and poultry grit and mineral food.

⁷Includes cement manufacture, flux stone, and sulfur oxide removal.

⁸Includes whiting or whiting substitute.

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

TABLE 5
INDIANA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2002,
BY MAJOR USE CATEGORY¹

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	7,010	\$29,400	\$4.19
Plaster and gunite sands	28	300	10.71
Concrete products (blocks, bricks, pipe, decorative, etc.)	100	808	8.08
Asphaltic concrete aggregates and other bituminous mixtures	1,420	7,390	5.22
Road base and coverings	895	4,550	5.08
Road stabilization (cement and lime)	305	986	3.23
Fill	2,710	12,300	4.55
Snow and ice control	535	1,840	3.44
Filtration	2	24	12.00
Other miscellaneous uses ²	50	626	12.52
Unspecified: ³			
Reported	8,860	40,100	4.53
Estimated	5,700	24,000	4.16
Total or average	27,600	122,000	4.42

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

²Includes roofing granules.

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

TABLE 6
INDIANA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2002, 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	1,960	7,680	2,710	15,300	2,470	7,490
Asphaltic concrete aggregates and road base materials ³	846	4,470	1,570	7,610	205	848
Fill	559	2,200	2,030	9,650	114	460
Snow and ice control	92	343	W	W	W	W
Filtration	2	24	--	--	--	--
Other miscellaneous uses ⁴	2	16	460	2,000	30	115
Unspecified: ⁵						
Reported	1,400	5,650	5,290	26,600	2,180	7,900
Estimated	2,400	9,500	1,000	3,700	2,300	10,000
Total	7,260	29,900	13,100	64,800	7,300	27,300

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.

³Includes road and other stabilization, cement, and lime.

⁴Includes roofing granules.

⁵Reported and estimated production without a breakdown by end use.