

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 1999, the preliminary estimated value¹ of nonfuel mineral production for Indiana was \$717 million, according to the U.S. Geological Survey (USGS). This was nearly a 4% increase from that of 1998,² and followed a 3.1% increase from 1997 to 1998. The State rose in rank to 19th from 21st among the 50 States in nonfuel mineral production value, of which Indiana accounted for close to 2% of the U.S. total.

Indiana's increase in nonfuel mineral value in 1999 mostly resulted from a \$13 million increase in construction sand and gravel, a \$9 million rise in crushed stone, and a \$5 million increase in portland cement; a smaller yet significant increase occurred in masonry cement. Only lime, dimension stone, and common clays showed decreases in value (\$1.5 million or less). In 1998, most nonfuel minerals increased in value, led by a nearly \$10 million increase in portland and masonry cements, a \$7.9 million rise in construction sand and gravel, and a more than \$3 million increase in dimension stone (table 1).

Compared with USGS estimates of the quantities of minerals produced in the other 49 States during 1999, Indiana remained first in dimension stone; one of the top two producing States of masonry cement; fourth in peat; fifth of five States that produce ball clay; and ninth in lime. Additionally, the State was a significant producer of crushed stone, portland cement, common clays, and construction sand and gravel, ranking 11th, 12th, 13th, and 13th, respectively. The State's mines exclusively produce industrial minerals and coal; all raw steel and primary aluminum produced in the State were processed from materials received from other domestic and foreign sources. Indiana continued to lead the Nation in the production of raw steel, with an estimated output of about 23 million metric tons (Mt) of raw steel, as reported by the American Iron and Steel Institute. Based upon USGS data, the State remained third in the production of primary aluminum.

¹The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending upon the minerals or 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 1999 USGS mineral production data published in this chapter are preliminary estimates as of May 2000, 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. A telephone listing for the specialists may be retrieved over the Internet at URL <http://minerals.usgs.gov/minerals/contacts/comdir.html>, by using MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset (request Document #1000 for a telephone listing of all mineral commodity specialists), or by calling USGS information at (703) 648-4000 for the specialist's name and number. All Mineral Industry Surveys—mineral commodity, State, and country—also may be retrieved over the Internet at URL <http://minerals.usgs.gov/minerals>; facsimile copies may be obtained from MINES FaxBack.

²Values, percentage calculations, and rankings for 1998 may vary from the Minerals Yearbook, Area Reports: Domestic 1998, Volume II, owing to the revision of preliminary 1998 to final 1998 data. Data for 1999 are preliminary and are expected to change; related rankings may also be subject to change.

The following narrative information was provided by the Indiana Geological Survey³ (IGS). Approximately 3,800 persons were employed in the nonfuel mining industry during 1999, an increase of 1.6% over 1998, according to preliminary figures released by the U.S. Mine Safety and Health Administration.

Due to increased demand, several new aggregate operations opened during the year. Some acquisitions also occurred. New crushed stone operations include two Hanson Aggregates Midwest, Inc. quarries, the Woodburn II Quarry in Allen County, the Limedale Quarry in Putnam County, and the J.W. Jones Crushed Stone, Inc. quarry in Putnam County. Mulzer's Crushed Stone, Inc.'s New Amsterdam Quarry, which had been producing temporarily with portable equipment, prepared to officially open its permanent plant. The Indiana Limestone Co., Inc. resumed crushing overburden rock at its dimension stone Crown Quarry in Monroe County with the assistance of a new company, Blackwell Moore, Inc. Martin Marietta Aggregates Inc. made plans to expand its Kentucky Avenue Mine in Marion County. Material Service Corp. of Chicago, IL, acquired two Ward Stone, Inc. quarries, the Francesville Quarry in Pulaski County and the Babcock Quarry in Jasper County. Sand and gravel operations opening during the year include J.W. Jones Crushed Stone, Inc.'s Waverly Pit in Morgan County, and Jones & Sons, Inc.'s Starpoint Pit in Knox County. Two sand and gravel operations in the planning or development stages include an Irving Materials, Inc. pit along Fall Creek in Hancock County, and a second pit for Silver Creek Sand & Gravel Co. in Floyd County. Rogers Group, Inc. will expand its Interstate Sand & Gravel operation in Warren County. Critser Companies, Inc. acquired Bass Lake Sand & Gravel in Starke County and the Hanna Pit in LaPorte County from Hanna Sand & Gravel Co., Inc. Triangle Gravel, Inc. in Warren County was acquired by Salts Sand & Gravel.

Crushed stone quarries closing during 1999 include Irving Materials, Inc. Pipe Creek Stone Co. in Grant County and Stoneco, Inc. Mill Creek Quarry in Miami County. Hanson Aggregates Midwest, Inc.'s Greencastle plant, a fine-ground limestone operation in Putnam County, also closed. Sand and gravel pits closing during the year include Vulcan Materials Co.'s Lafayette and Harner Pits both in Tippecanoe County, Engineering Aggregates Corp.'s O. Wilson Pit in Cass County, and Littleton Sand & Supply in Boone County. There were developments in other industrial minerals industries as well. Indiana Limestone Co. Inc. (producers of Salem Limestone) had a very good year with producers experiencing some trouble in keeping pace with demand for the stone. There has been an increase in the use of limestone for high-end residential construction. Phoenix Limestone Co. closed its quarry in Lawrence County. Dyckerhoff AG, an international cement and building materials company headquartered in Germany,

³Kathryn R. Shaffer, Minerals Statistician, authored the text of State minerals information submitted by the Indiana Geological Survey.

acquired Lone Star Industries, Inc., which operates a plant in Greencastle, Putnam County. The Greencastle plant will undergo a \$75 million expansion to be completed by mid-2000, increasing capacity from 540,000 metric tons to 1.22 Mt, adding a new production line and preheater tower and converting to a semidry process. General Shale Products Corp., which operates two neighboring plants in Morgan County, was acquired by the Wienerberger Group, based in Vienna, Austria, in July. In February 1999, the Carmeuse Group and the Lafarge Group finalized the merger combining their U.S. and Canadian lime operations with Carmeuse controlling a 60% and Lafarge a 40% interest. Carmeuse operates the Marblehead lime plant in Lake County. The gypsum industry was also busy with U.S. Gypsum Co. rebuilding and modernizing its plant in East Chicago, Lake County.

Rogers Group, Inc.'s Greene County Sand & Gravel, near Bloomfield, IN, was awarded a Bronze Environmental Eagle Certificate of Accomplishment by the National Stone Association and the U.S. Environmental Protection Agency for reclamation completed during 1998.

International economic problems led to large quantities of imported steel, adversely affecting domestic steel producers. Qualitech Steel Corp. at Pittsboro in Hendricks County, filed for Chapter 11 bankruptcy protection. The company opened late in June 1998, about the same time the market began to be flooded with low-cost foreign imports. In addition, a damaged furnace shut down the operation for 4 weeks. Qualitech was the fourth U.S. steel company to close during the year, primarily due to the import problem. However, there were several positive developments in the Indiana steel industry during 1999. Steel Dynamics, Inc., which currently operates a minimill near Butler in DeKalb County, plans to build a steel beam mill about 32 kilometers (km) away in Columbia City, Whitley County, with startup planned for the second quarter of 2000. Steel Dynamics, Inc. also operates Iron Dynamics, a plant that produces liquid iron ore for its steel plant at Butler by a coal-based direct-reduction process; it may construct a similar facility for the new steel plant. Heartland Steel Buildings is constructing a \$285 million steel plant at Terre Haute, Vigo County, and started the pickling line during the year. The mill is the only one in the world using equipment called Dynamic Shaperoll, which precisely controls the width and thickness of rolled steel. The company plans to build as many as four more plants nationwide if this one is successful. Federal regulators approved the merger of AK Steel Corp. with its former parent company Armco, Inc., based in Pittsburgh, PA, to form the fifth largest steel company in the country. AK Steel Corp. operates a plant in Rockport. New lines were opened at the AK Steel plant, and improvements were made at Bethlehem Steel Corp., Bethlehem Lukens Plate, Ispat Inland Inc., LTV Steel Co., National Steel Corp., and USX Corp. - U.S. Steel Group, Inc., Gary Works. Weirton Steel Corp. with Corus Group PLC formed GalvPro LP, which initiated production in November at a plant producing hot-dipped galvanized steel in Jeffersonville. Indiana's steel industry requested the State revise regulations to allow trucks to carry more weight on Indiana highways.

The Alcoa Inc., which operates a plant in Warrick County, began arrangements to acquire Reynolds Metals Co.

Increased Federal and State funding for road maintenance and improvement led to increased activity in the Indiana aggregates industry during 1999. The State budgeted \$709 million in 1999 on road improvements, more than any previous year, with approximately \$108 million of that amount being used for interstate improvements. The largest single project was \$40 million for the Hoosier Heartland Highway linking Fort Wayne to Lafayette in northern Indiana. Indiana was awarded an additional \$2 million of funds from the 1998 national highway bill for the Hoosier Heartland Highway. A \$10 million Federal grant for environmental studies related to the extension of I-69 from Indianapolis to Evansville was awarded to Indiana and six other States. Indiana's share of the grant was \$1.25 million. The final decision on whether to build the extension and its location should be made in 2002. The Federal Government approved an environmental impact statement for widening and extending U.S. 231 in Spencer County, a \$120 million project expected to begin in 2002. The new construction will connect I-64 to the \$55.5 million William H. Natcher Bridge over the Ohio River, near Rockport, which is currently under construction. The AK Steel Corp. plant at Rockport will benefit from the area road improvements. The State continued to work on locating sites for two new bridges across the Ohio River in the Jeffersonville, IN, and Louisville, KY, area. In addition, the State announced \$200 million over 2 years for Indiana county, city, and town road improvements to be funded from the State's surplus funds. In other construction news, Eli Lilly and Co. announced that it would spend \$1 billion over the next 10 years to expand its operations in Indianapolis, a second Toyota plant costing \$800 million is planned for the Princeton area, and plans were unveiled for the new \$65 million Indiana State Museum in Indianapolis. The Ohio River Greenway Project, which is expected to cost about \$36 million, received \$3.29 million in Federal funds. The project will include a road, an amphitheater, playgrounds, picnic areas, a bike path, an overlook of the Ohio River, a bridge spanning Silver Creek, a boat ramp, and a walking trail along 11 km of the Ohio River in Clark and Floyd Counties.

No State legislation specific to industrial minerals mining was passed during 1999. However, legislation that permits use of Type III foundry sand for landfills or soil amendments or as an addition to building materials, such as brick and concrete, passed and was signed into law. The Mineral Resources Section of the IGS, with funding from the USGS, is mapping the bedrock geology of the northcentral Heartlands area and the Indianapolis quadrangle at 1:100,000 scale. The IGS is also updating its Directory of Industrial Mineral Producers in Indiana with funding from the Indiana Mineral Aggregates Association using a Global Positioning System to produce more detailed locality maps. The IGS published Miscellaneous Map 41, Map of Indiana Showing Locations of Coal and Industrial Minerals Operations, by N.R. Shaffer, scale 1:500,000, in color. Finally, the Safe, Quiet and Durable Highway Institute will be formed this year at Purdue University with support funds from the Indiana Department of Transportation (INDOT). The Institute will study ways to improve pavements to reduce noise from automobiles and trucks. The Institute will receive matching funds of \$3 million by 2003 from INDOT. Other funds will come from Purdue University and industry.

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN INDIANA 1/ 2/

(Thousand metric tons and thousand dollars, unless otherwise specified)

Mineral	1997		1998		1999 p/	
	Quantity	Value	Quantity	Value	Quantity	Value
Cement: Portland	2,400	168,000 e/	2,500	175,000 e/	2,560	180,000 e/
Clays: Common	947	2,040	681	1,330	684	1,300
Gemstones	NA	3	NA	3	NA	3
Sand and gravel: Construction	21,900	93,100	24,000	101,000	26,500	114,000
Stone:						
Crushed 3/	59,000	281,000 r/	61,600	283,000	62,200	292,000
Dimension metric tons	190,000 3/	24,900 3/	220,000	28,200	223,000	27,300
Combined values of cement (masonry), clays [ball, (1998-99)], gypsum (crude), lime, peat, sand and gravel (industrial), stone [crushed slate, dimension dolomite (1997)]	XX	101,000	XX	102,000	XX	102,000
Total	XX	670,000	XX	691,000	XX	717,000

e/ Estimated. p/ Preliminary. r/ Revised. NA Not available. 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.

3/ Excludes certain stones; kind and value included with "Combined values" data.

TABLE 2
INDIANA: CRUSHED STONE SOLD OR USED, BY KIND 1/

Kind	1997				1998			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone 2/	78 r/	48,800 r/	\$228,000 r/	\$4.68 r/	80	48,300	\$220,000	\$4.5
Dolomite	16 r/	10,200 r/	52,400 r/	5.12 r/	17	11,500	51,900	4.52
Traprock	--	--	--	--	1	W	W	W
Slate	1	W	W	W	1	1,900	10,200	5.40
Total or average	XX	59,000	281,000 r/	4.75	XX	61,600	283,000	4.58

r/ Revised. W Withheld from total to avoid disclosing company proprietary data. XX Not applicable. -- Zero.

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
INDIANA: CRUSHED STONE SOLD OR USED BY PRODUCERS
IN 1998, BY USE 1/ 2/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Macadam	111	\$733	\$6.6
Riprap and jetty stone	806	4,330	5.37
Filter stone	275	1,280	4.66
Total or average	1,190	6,340	5.32
Coarse aggregate, graded:			
Concrete aggregate, coarse	4,660	21,400	4.61
Bituminous aggregate, coarse	3,600	17,100	4.76
Bituminous surface-treatment aggregate	3,290	14,000	4.26
Railroad ballast	258	1,090	4.21
Total or average	11,800	53,700	4.55
Fine aggregate (-3/8 inch):			
Stone sand, concrete	238	997	4.19
Stone sand, bituminous mix or seal	112	693	6.19
Screening, undesignated	158	581	3.68
Other fine aggregate	103	909	8.83
Total or average	611	3,180	5.20
Coarse and fine aggregates:			
Graded road base or subbase	3,220	15,600	4.84
Unpaved road surfacing	1,230	6,150	4.98
Crusher run or fill or waste	1,220	5,030	4.11
Lightweight aggregate (slate)	20	110	5.50
Other coarse and fine aggregates	824	3,250	3.94
Total or average	6,520	30,100	4.62
Other construction materials			
Agricultural:	1,390	7,650	5.51
Agricultural limestone	2,820	12,600	4.46
Other agricultural uses	12	39	3.25
Total or average	2,830	12,600	4.45
Chemical and metallurgical:			
Cement manufacture	3,770	15,000	3.98
Dead-burned dolomite manufacture	W	W	3.29
Flux stone	W	W	3.61
Sulfur oxide removal	W	W	4.27
Total or average	4,320	17,300	3.99
Special: Whiting or whiting substitute	(3/)	(3/)	(3/)
Other miscellaneous uses	W	W	3.54
Unspecified: 4/			
Actual	27,900	128,000	4.61
Estimated	4,700	21,700	4.61
Total or average	32,600	150,000	4.61
Grand total or average	61,600	283,000	4.58

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/ Includes dolomite, limestone, limestone-dolomite, and slate; excludes traprock from State to avoid disclosing company proprietary data.

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

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

TABLE 4
INDIANA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1998, BY USE AND DISTRICT 1/ 2/

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:						
Coarse aggregate (+1 1/2 inch) 3/	489	2,400	103	737	601	3,210
Coarse aggregate, graded 4/	2,470	11,600	829	4,570	8,510	37,600
Fine aggregate (-3/8 inch) 5/	265	1,160	195	1,360	152	663
Coarse and fine aggregate 6/	2,640	10,600	2,060	10,300	1,820	9,250
Other construction materials	--	--	--	--	1,390	7,650
Agricultural 7/	2,150	10,100	161	704	523	1,780
Chemical and metallurgical 8/	789	2,610	977	3,230	2,550	11,400
Special 9/	--	--	--	--	W	W
Other miscellaneous uses	--	--	--	--	W	W
Unspecified:10/						
Actual	7,850	36,400	12,300	55,900	7,720	36,200
Estimated	1,290	5,840	668	3,080	2,750	12,800
Total	17,900	80,700	17,300	79,900	26,400	122,000

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/ Excludes traprock from total to avoid disclosing company proprietary data.

3/ Includes filter stone, macadam, and riprap and jetty stone.

4/ Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, and railroad ballast.

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

6/ Includes crusher run (select material or fill), graded road base or subbase, unpaved road surfacing, and other coarse and fine aggregates.

7/ Includes agricultural limestone and other agricultural uses.

8/ Includes cement manufacture, dead-burned dolomite manufacture, flux stone, and sulfur oxide removal.

9/ Includes whiting or whiting substitute.

10/ Reported and estimated production without a breakdown by end use.

TABLE 5
INDIANA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1998,
BY MAJOR USE CATEGORY 1/

Use	Quantity	Value	Unit
	(thousand metric tons)	(thousands)	value
Concrete aggregate	6,040	\$23,300	\$3.86
Plaster and gunit sands	46	252	5.48
Concrete products (blocks, bricks, pipe, decorative, etc.)	101	532	5.27
Asphaltic concrete aggregates and other bituminous mixtures	1,470	4,680	3.19
Road base and coverings 2/	1,360	5,640	4.16
Fill	1,930	7,710	4.01
Snow and ice control	197	641	3.25
Other miscellaneous uses 3/	328	1,220	3.73
Filtration	32	254	7.94
Unspecified: 4/			
Actual	9,290	44,100	4.75
Estimated	3,220	13,100	4.06
Total or average	24,000	101,000	4.22

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

2/ Includes road and other stabilization (cement and lime).

3/ Includes roofing granules.

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

TABLE 6
 INDIANA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1998,
 BY USE AND DISTRICT 1/

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate	1,530	5,560	2,280	12,000	2,230	5,730
Concrete products (blocks, bricks, pipe, decorative, etc.) 2/	74	322	W	W	W	W
Asphaltic concrete aggregates and other bituminous mixtures	961	2,980	150	456	355	1,250
Road base and coverings 3/	567	2330	912	3,550	72	409
Fill	374	1,270	1,290	5,410	260	1,030
Other miscellaneous uses 4/	335	1,300	W	W	W	W
Unspecified: 5/						
Actual	594	2,250	6,630	32,900	2,070	8,950
Estimated	1,110	4,790	1,170	4,870	941	3,440
Total	5,550	20,800	12,500	59,500	5,970	21,100

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/ Includes plaster and gunite sands.

3/ Includes road and other stabilization (cement) and snow and ice control.

4/ Includes filtration and roofing granules.

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