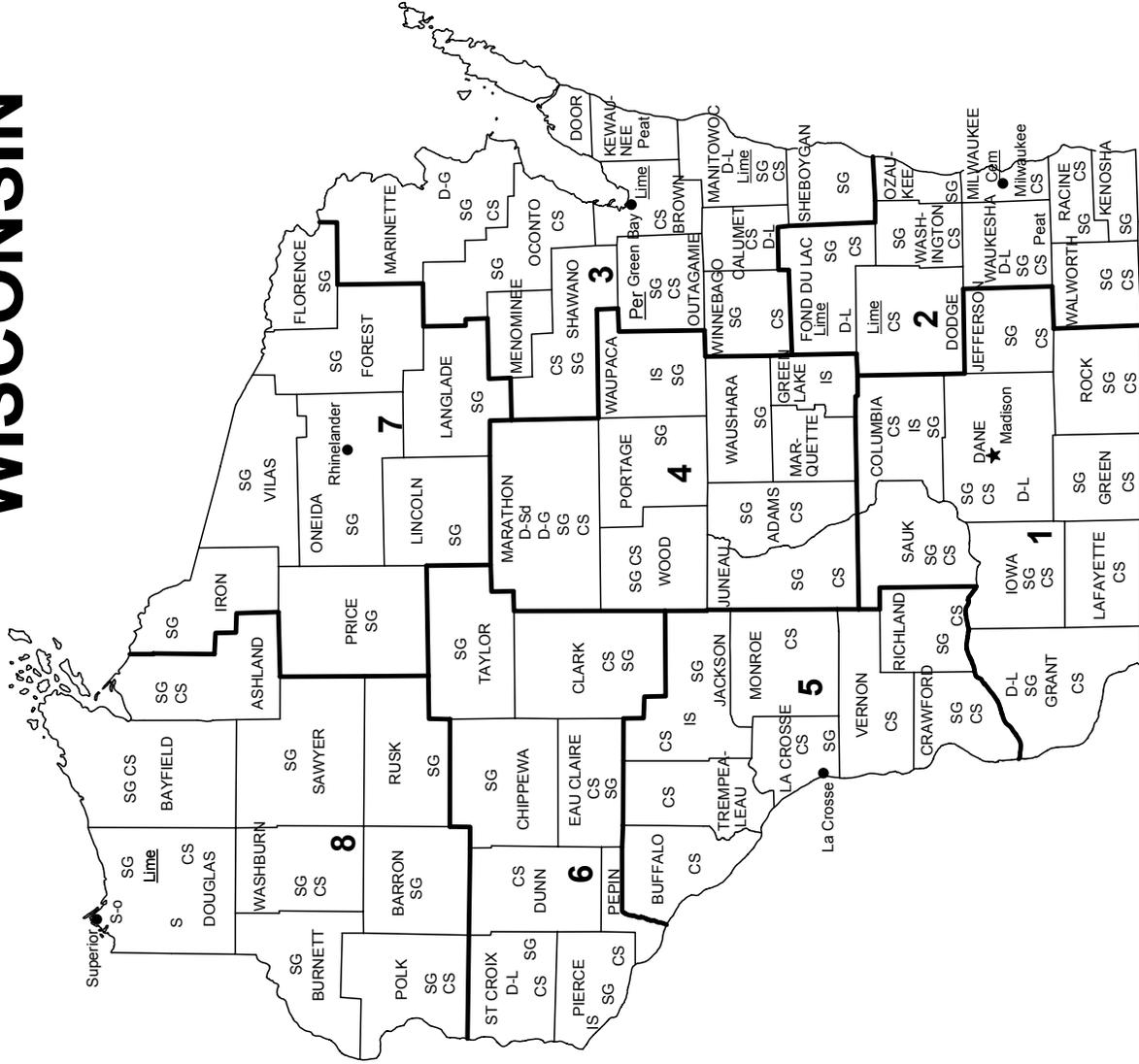


WISCONSIN

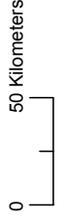


LEGEND

- County boundary
- ★ Capital
- City
- 1 Crushed stone/sand and gravel districts

MINERAL SYMBOLS (Major producing areas)

- Cem Cement plant
- CS Crushed stone
- D-G Dimension granite
- D-L Dimension limestone
- D-Sd Dimension sandstone
- IS Industrial sand
- Lime Lime plant
- Peat Peat
- Per Perlite plant
- S Sulfur (recovered)
- S-o Sulfur (oil)
- SG Construction sand and gravel



THE MINERAL INDUSTRY OF WISCONSIN

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

In 2003, the estimated value¹ of nonfuel mineral production for Wisconsin was \$405 million, based upon preliminary U.S. Geological Survey (USGS) data. This was a more than 3% increase from that of 2002² and followed a 7.4% increase in 2002 from that of 2001. The State was 32d in rank (33d in 2002) among the 50 States in total nonfuel mineral production value, of which Wisconsin accounted for more than 1% of the U.S. total.

Crushed stone and construction sand and gravel were (in descending order of value) Wisconsin's leading nonfuel minerals in 2003, accounting for about 40% and 39%, respectively, of the State's total nonfuel raw mineral production value (table 1). These were followed by lime, being more than 9% of the total value, industrial sand and gravel, about 8%, and dimension stone, more than 3% of the total value. Because data for industrial sand and gravel (2001), peat, and portland cement have been withheld (company proprietary data), the actual total values for 2001 to 2003 are higher than those reported in table 1.

In 2002, the inclusion of the value of industrial sand and gravel produced in Wisconsin in table 1 was the main reason for the magnitude of the State's increase in total nonfuel mineral value from that of 2001. However, the most significant increase in nonfuel mineral value for an individual commodity resulted from the recent startup of cement production, the data of which are withheld (company proprietary data); the cement facility is a grinding plant that uses imported clinker. Also, crushed stone value and dimension stone production and value showed small increases. Decreases took place in construction sand and gravel, down \$5 million, industrial sand and gravel, and lime, down \$1.3 million (table 1).

Based upon USGS estimates of the quantities of minerals produced in the 50 States during 2003, Wisconsin continued to be fourth in dimension stone; increased to eighth from ninth in construction sand and gravel and to fifth from sixth in peat; and decreased to a virtual tie for fifth from fourth in industrial sand and gravel. The demand for Wisconsin dimension limestone remained brisk through 2003, fueled by demand for landscape and building products. Additionally, the State was a significant producer of crushed stone and lime.

The following narrative information was provided by the Wisconsin Geological and Natural History Survey.³

Exploration and Development

In 2003, for the fifth consecutive year, no exploratory drill holes were initiated or completed in Wisconsin, and no substantive mineral leasing activity occurred. Some activity took place with regard to the expansion of current mining and processing operations. Fairmount Minerals, Inc.'s silica sand mine at Maiden Rock in Pierce County began plans to expand Wisconsin's only currently active underground mining operation; the company produces industrial and hydrofrac sand from the Cambrian Jordan Formation. Halquist Stone Co. of Sussex in Waukesha County expanded the processing plant at its Chilton dimension limestone quarry in Calumet County.

The lack of interest in exploration drilling and mineral leasing was mainly attributed to industry concern with the prolonged review of the Nicolet (Crandon) Mine project in Forest County and the length of time involved in such a review under Wisconsin's mining regulations. The 50-million-metric-ton, zinc-copper massive-sulfide deposit had been discovered in 1975 precipitating years of project evaluation within a climate of increasingly rancorous regulatory activity and changing project designs. The latest project development work began in 1994 and, despite a series of ownership changes and modifications in project plans, was approaching a major endpoint in the regulatory process when, yet again, the company was sold in October 2003.

The longtime regulatory process for the proposed Nicolet Mine concluded with the sale of Nicolet Minerals Co. to the Sakaogon Chippewa and the Potawatomi Native American communities for a reported \$16.5 million. The new owners were longtime opponents of the proposed mine. The mining permit applications were withdrawn shortly after the sale, and specific plans for the site were undetermined, but were unlikely to include mineral development in the near future.

In 2002, prior to the purchase by the Sakaogon Chippewa and Potawatomi Native American communities, Nicolet Minerals and its holdings had been purchased for an undisclosed sum by a locally owned natural resources company which, in turn, had been seeking to identify corporate partners interested in pursuing mine development. Rumors of potential sale of the land holdings totaling

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 Mineral Industry Surveys—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.

³Bruce A. Brown, Geologist (nonmetallic minerals), and Thomas J. Evans, Geologist (metallic minerals), both of the Wisconsin Geological and Natural History Survey, coauthored the text of the State mineral industry information provided by that agency.

approximately 2,030 hectares (5,000 acres) circulated widely in 2002. Opponents of the proposed mine project sought State support for public purchase of the Nicolet property, but appraisals by the State of the land and mineral holdings ranged from \$51 million to \$94 million. The State did not pursue purchase of the property because of an extremely tight State budget and the high appraisal value.

Legislation and Government Actions

Legislation was introduced in 2003 to require local governments involved in comprehensive land-use planning to notify nonmetallic mining property owners and leaseholders of any changes in planned future land use that would affect their operations. This bill, Wisconsin Act 307, was enacted and signed into law early in the spring of 2004.

Wisconsin's nonmetallic mining reclamation rules [Wisconsin Department of Natural Resources (WDNR) rule N.R. 135] took effect on September 1, 2001, after which time all new mines were required to submit a reclamation plan and receive a reclamation permit along with all other permits necessary for startup and operation. Existing mines were granted an automatic permit to legally operate while they prepared and submitted a reclamation plan for approval. Aggregate producers, dimension stone quarries, and industrial sand and lime operations were preparing and submitting reclamation plans to local regulatory authorities throughout 2002 and 2003. Rule 135 is administered by county and local governments, with oversight by the WDNR.

During the implementation period of rule 135, concerns were raised by operators and regulators regarding uniformity of fees, application of performance-based standards (particularly regarding highwalls and topsoil), and concerns over duplication of financial assurance required for the reclamation plan. The operational issues were resolved through a series of educational workshops sponsored by the WDNR, and the financial assurance issue was resolved by legislation, Wisconsin Act 308 (enacted in 2004). By the end of 2003, some issues remained, but there was general agreement among operators, regulators, and WDNR that the program was in place and operating successfully.

During 2003, legislative activity was limited to several proposals, most of which were introduced in early 2003, that were designed to restrict mineral development, in particular that of metallic minerals. Similar proposals had been introduced in 2001. The first proposal called for a ban on the use of cyanide compounds in metallic mineral mining projects in Wisconsin, and the second proposal was for a number of modifications to regulatory requirements related to mining waste and related ground water protection requirements and management issues. A third proposal if enacted would have removed from the WDNR the authority to grant exemptions to requirements of State administrative rules that were applicable to metallic mining. These proposals did not receive formal floor action during the year, and, therefore, were considered to have lapsed at the close of the legislative session. Nevertheless, reintroduction of the proposals in 2004 was expected.

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

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral	2001		2002		2003 ^P	
	Quantity	Value	Quantity	Value	Quantity	Value
Cement, portland	--	--	W	(3)	W	(3)
Gemstones	NA	6	NA	6	NA	6
Lime	617	36,900	603	35,600	640	38,400
Peat	W	(3)	W	(3)	W	(3)
Sand and gravel:						
Construction	41,600	159,000	39,000	154,000	39,100	156,000
Industrial	1,710	(3)	1,740	32,700	1,740	32,700
Stone:						
Crushed	36,600	150,000	36,200	151,000	38,000	163,000
Dimension	99	18,900	100	19,300	177	14,500
Total	XX	365,000	XX	392,000	XX	405,000

^PPreliminary. NA Not available. W Withheld to avoid disclosing company proprietary data. XX Not applicable. -- Zero.

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.

³Value excluded to avoid disclosing company proprietary data.

TABLE 2
WISCONSIN: 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	136	28,700 ^r	\$118,000 ^r	\$4.29 ^r	136	28,800	\$120,000	\$4.17
Dolomite	11 ^r	2,670	11,100	4.15 ^r	9	2,660	11,300	4.26
Granite	3	1,370	5,380	3.92	2	1,030	3,930	3.81
Sandstone and quartzite	5	2,430	9,860	4.05	5	1,740	6,920	7.61
Traprock	3	1,170	4,550	3.93 ^r	4	1,450	5,800	4.01
Miscellaneous stone	1	181	1,060	5.84 ^r	1	455	2,660	5.84
Total or average	XX	36,600	150,000	4.10 ^r	XX	36,200	151,000	4.17

^rRevised. 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

WISCONSIN: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2002, BY USE ¹

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Construction:			
Coarse aggregate (+1 1/2 inch):			
Macadam	W	W	\$5.17
Riprap and jetty stone	90	\$542	6.04
Filter stone	168	741	4.40
Other coarse aggregates	749	3,710	4.96
Total or average	1,010	5,000	4.96
Coarse aggregate, graded:			
Concrete aggregate, coarse	1,160	6,810	5.85
Bituminous aggregate, coarse	188	1,110	5.91
Bituminous surface-treatment aggregate	183	969	5.29
Railroad ballast	W	W	4.41
Other graded coarse aggregates	66	276	4.18
Total or average	1,600	9,170	5.73
Fine aggregate (-3/8 inch) screening, undesignated	411	2,060	5.02
Coarse and fine aggregate:			
Graded road base or subbase	5,350	23,700	4.43
Unpaved road surfacing	190	880	4.62
Crusher run or fill or waste	536	2,290	4.27
Roofing granules	W	W	3.64
Other coarse and fine aggregates	952	3,790	3.98
Total or average	7,030	30,700	4.36
Other construction materials	68	288	4.24
Agricultural:			
Agricultural limestone	57	375	6.56
Poultry grit and mineral food	(2)	(2)	5.50
Unspecified:³			
Reported	2,110	9,230	4.38
Estimated	24,000	93,000	3.93
Total or average	25,900	103,000	3.96
Grand total or average	36,200	151,000	4.17

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
WISCONSIN: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2002, BY USE AND DISTRICT^{1,2}

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3		District 4	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction:								
Coarse aggregate (+1 1/2 inch) ³	W	W	W	W	271	1,240	W	W
Coarse aggregate, graded ⁴	W	W	W	W	W	W	--	--
Fine aggregate (-3/8 inch) ⁵	W	W	W	W	W	W	--	--
Coarse and fine aggregate ⁶	2,800	10,900	1,300	6,560	1,550	6,980	W	W
Other construction materials	2	11	--	--	65	278	--	--
Agricultural ⁷	W	W	W	W	--	--	--	--
Unspecified:⁸								
Reported	685	2,830	--	--	455	2,660	970	3,740
Estimated	3,000	12,000	3,600	13,000	4,900	19,000	660	2,600
Total	7,020	28,500	6,500	29,300	7,620	32,200	2,270	9,180
Use	District 5		District 6		District 8		Unspecified districts	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction:								
Coarse aggregate (+1 1/2 inch) ³	W	W	W	W	W	W	73	346
Coarse aggregate, graded ⁴	W	W	W	W	W	W	--	--
Fine aggregate (-3/8 inch) ⁵	--	--	--	--	--	--	106	550
Coarse and fine aggregate ⁶	W	W	W	W	W	W	312	1,380
Other construction materials	--	--	--	--	--	--	--	--
Agricultural ⁷	--	--	--	--	--	--	--	--
Unspecified:⁸								
Reported	--	--	--	--	--	--	--	--
Estimated	8,600	34,000	1,800	7,000	1,200	5,000	--	--
Total	8,790	35,100	1,950	7,890	1,510	6,240	491	2,270

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

¹No production in District 7.

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

³Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregates.

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

⁵Includes screening (undesigned).

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

⁷Includes agricultural limestone and poultry grit and mineral food.

⁸Reported and estimated production without a breakdown by end use.

TABLE 5
WISCONSIN: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2002,
BY MAJOR USE CATEGORY ¹

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	7,640	\$32,600	\$4.27
Plaster and gunitite sands	30	233	7.77
Concrete products (blocks, bricks, pipe, decorative, etc.)	752	3,160	4.20
Asphaltic concrete aggregates and other bituminous mixtures	1,770	8,580	4.85
Road base and coverings	5,270	17,900	3.39
Road stabilization (lime)	494	2,950	5.98
Fill	1,810	5,310	2.94
Snow and ice control	95	380	4.00
Roofing granules	5	31	6.20
Other miscellaneous uses ²	164	784	4.78
Unspecified: ³			
Reported	7,240	27,700	3.82
Estimated	14,000	54,000	3.94
Total or average	39,000	154,000	3.94

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

²Includes filtration.

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

TABLE 6
WISCONSIN: 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 (including concrete sand)	1,300	5,590	2,300	9,680	1,810	7,280
Concrete products (blocks, bricks, pipe, decorative, etc.) ²	41	205	703	3,040	W	W
Asphaltic concrete aggregates and other bituminous mixtures	W	W	347	1,610	W	W
Road base and coverings ³	166	749	2,340	10,700	1,220	4,030
Fill	126	454	914	3,230	475	1,040
Snow and ice control	1	18	5	35	28	100
Roofing granules	5	31	--	--	--	--
Other miscellaneous uses ⁴	327	1,410	48	196	327	1,060
Unspecified: ⁵						
Reported	1,160	5,180	5,140	20,000	121	494
Estimated	180	680	2,500	9,400	980	3,800
Total	3,300	14,300	14,300	57,900	4,960	17,800
Use	District 4		District 5		District 6	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate (including concrete sand)	921	3,930	--	--	337	1,500
Concrete products (blocks, bricks, pipe, decorative, etc.) ²	W	W	--	--	--	--
Asphaltic concrete aggregates and other bituminous mixtures	234	1,910	--	--	128	1,020
Road base and coverings ³	270	788	--	--	103	350
Fill	80	295	--	--	45	71
Snow and ice control	--	--	--	--	43	187
Roofing granules	--	--	--	--	--	--
Other miscellaneous uses ⁴	13	98	--	--	21	81
Unspecified: ⁵						
Reported	703	1,770	--	--	5	8
Estimated	3,900	15,000	830	3,200	3,000	14,000
Total	6,120	23,600	830	3,200	3,720	17,000
Use	District 7		District 8		Unspecified districts	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate (including concrete sand)	153	529	446	2,010	379	2,090
Concrete products (blocks, bricks, pipe, decorative, etc.) ²	--	--	--	--	--	--
Asphaltic concrete aggregates and other bituminous mixtures	48	162	88	247	384	1,690
Road base and coverings ³	633	1,770	1,030	2,400	--	--
Fill	13	41	38	53	115	127
Snow and ice control	7	20	12	20	--	--
Roofing granules	--	--	--	--	--	--
Other miscellaneous uses ⁴	--	--	5	33	--	--
Unspecified: ⁵						
Reported	345	70	71	118	--	--
Estimated	900	3,400	910	3,300	460	1,700
Total	1,790	5,980	2,600	8,150	1,340	5,650

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 (lime).

⁴Includes filtration.

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