

THE MINERAL INDUSTRY OF WISCONSIN

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

Wisconsin ranked 29th among the 50 States in total nonfuel mineral production value¹ in 1995, according to the U.S. Geological Survey (USGS). The State was 30th in 1994. The estimated value for 1995 was \$441 million, an 8% increase compared with that of 1994. This followed a 30% increase from 1993 to 1994 (based on final 1994 data). The State accounted for more than 1% of the U.S. total nonfuel mineral production value.

In 1995, nearly one-third of Wisconsin's nonfuel mineral value was attributed to metal production; higher metal values were the major cause for the State's increased mineral value. A substantial gain in construction sand and gravel value also contributed to the State's overall increase. In 1994, the increase in metal value was significantly greater, reflecting the first full year of production at the Flambeau Mine, than the (also substantial) increase that took place in 1995. Increases in crushed stone and construction sand and gravel values also significantly contributed to the State's overall increase in 1994. Other mineral commodity values that increased in 1995 included: copper, lime, dimension stone, silver, peat, gemstones, and

crushed quartzite.

Wisconsin's nonfuel mineral value has increased steadily for the past 3 years, since the resumption of metal mining. Every year from the early 1800's through 1982, metallic mineral production had been reported in the State. In the spring of 1982, metal mining ceased in Wisconsin when the Black River Falls Mine, an open pit taconite (iron ore) mine, closed because of decreased demand for steel. Following a decade of low to moderate metals exploration activities in the State, the Flambeau Mine came on-line in 1993, shipping its first copper, gold, and silver ore to a refinery in Canada in May.

Compared to USGS estimates of quantities produced in the other 49 States for 1995, Wisconsin moved up from sixth to fifth place in the production of copper, while it remained third in dimension stone, fifth in industrial sand and gravel, and ninth in construction sand and gravel. Wisconsin climbed from 16th to 11th in the production of peat, and remained 11th in silver, and 12th of 14 States that produce gold. While being lower in the rankings than the previously mentioned commodities, significant

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

Mineral	1993		1994		1995 ^p	
	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Gemstones	NA	\$45	NA	\$53	NA	\$65
Lime thousand metric tons	511	30,900	507	30,300	543	32,800
Peat metric tons	W	W	2,000	61	W	W
Sand and gravel:						
Construction do.	^e 27,600	^e 82,800	29,200	91,500	31,000	101,000
Industrial metric tons	1,480,000	31,400	1,630,000	32,400	1,630,000	32,400
Silica stone ³ do.	W	W	45	80	45	80
Stone:						
Crushed thousand metric tons	26,200	98,000	28,500	⁴ 114,000	28,200	⁴ 114,000
Dimension metric tons	122,000	13,100	12,500	14,100	128,000	15,600
Combined value of copper, gold ^f , silica stone (1993), silver, stone [crushed quartzite (1994-95), tripoli (1993), and values indicated by symbol W						
	XX	57,100	XX	126,000	XX	146,000
Total ⁴	XX	313,000	XX	409,000	XX	441,000

^eEstimated. ^pPreliminary. ^rRevised. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. 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.

³Formerly identified as "Abrasives." Grindstones, pulpstones, and sharpening stones; excludes mill liners and grinding pebbles.

⁴Excludes certain stones; value included with "Combined value" data.

⁵Placer canvassing discontinued beginning 1994.

quantities of crushed stone and lime were produced in Wisconsin mines and manufacturing plants.

The remainder of this narrative was derived from information provided by the Wisconsin Geological and Natural History Survey (WGNHS). Both the metallic and industrial mineral industries experienced significant activity during 1995. For the metal-mining industry, the successful operation of the Flambeau Mine and the continuing evaluation of Crandon Mining Co.'s (CMC) zinc-copper project in Forest County highlighted the year. For the industrial mineral industry, the ongoing review of proposed administrative rules to regulate mine reclamation was the principal issue of concern.

Flambeau Mining Co.'s open pit copper-gold-silver operation near Ladysmith, Rusk County, continued to be Wisconsin's major producer of metallic mineral ore. Mining of the massive sulfide ore, containing enriched levels of copper metal and smaller quantities of gold and silver, remained at near-peak levels. According to the Wisconsin Department of Natural Resources (DNR), no environmental compliance problems were encountered during 1995. Flambeau paid in excess of \$6.1 million in 1995 for the occupational tax levied on the net proceeds of the mine—a requirement for metalliferous mining operations in the State.

CMC completed an environmental impact report (EIR) and most of the necessary permit applications for its proposed zinc-copper underground mine in Forest County. At yearend, the Wisconsin DNR was reviewing CMC's EIR and permit applications. WGNHS reported that this large, massive sulfide deposit comprises about 50 million metric tons of ore, with reported grades of zinc and copper that average 5% and 1%, respectively, over the entire ore body. Minor quantities of lead, gold, and silver are also present and potentially recoverable.

The Mining Investment and Local Impact Fund Board (MILIFB) is responsible for the distribution of certain net-proceed tax revenues from Wisconsin mining operations. The MILIFB's fund increased by \$4.2 million, primarily

from payments made by Flambeau Mining Co. (a Kennecott Corp. subsidiary). The MILIFB reported a final net balance of about \$2.3 million after honoring all encumbrances and making disbursements to local communities. Expenditures were for mining-related impacts, notice-of-intent payments, as well as first-dollar payments in the Ladysmith area (about \$2 million).

Metallic mineral leasing was at a much-reduced level in 1995; however, a proposal to lease several thousand acres of county forest land in west-central Wisconsin by Flambeau Mining Co. was under active negotiation at yearend.

Metallic mineral exploration proceeded at a moderate rate during the year. By early November, a total of 46 drill holes had been drilled and abandoned by three companies: BHP Minerals Inc., Sharpe Energy and Resources, Ltd., and Flambeau.

Statewide nonmetallic mining reclamation rules were the subject of several hearings. Chapter NR 135, which established minimum standards for the reclamation of nonmetallic mining operations, was mandated by the passage of the 1993 Wisconsin Act 464. But, the Department continued a postponement of the promulgation of NR 135 pending revisions to the proposed rule and potential statutory language modifications.

¹The terminologies "nonfuel mineral production" and related "values" encompass variations in meaning, depending on 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 1995 USGS mineral production data published in this chapter are estimated as of Dec. 1995. Estimates for some commodities, e.g., construction sand and gravel, crushed stone, and portland cement, are periodically updated. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

TABLE 2
WISCONSIN: CRUSHED STONE¹ SOLD OR USED BY PRODUCERS IN 1994, BY USE ²

Use	Quantity (thousand metric tons)	Value (thousands)	Unit Value
Coarse aggregate (+1 1/2 inch):			
Macadam	W	W	\$4.22
Riprap and jetty stone	172	\$1,110	6.45
Filter stone	182	751	4.13
Other coarse aggregate	94	370	3.94
Coarse aggregate, graded:			
Concrete aggregate, coarse	1,410	6,240	4.42
Bituminous aggregate, coarse	696	3,180	4.57
Bituminous surface-treatment aggregate	173	830	4.80
Railroad ballast	71	318	4.48
Other graded coarse aggregate	419	1,820	4.35
Fine aggregate (-3/8 inch):			
Stone sand, concrete	W	W	8.52
Stone sand, bituminous mix or seal	21	85	4.05
Screening, undesignated	516	2,860	5.55
Coarse and fine aggregates:			
Graded road base or subbase	6,790	24,800	3.65
Unpaved road surfacing	948	1,830	1.93
Crusher run or fill or waste	555	1,680	3.03
Other coarse and fine aggregates	73	302	4.14
Other construction materials ³	1,110	4,810	4.32
Agricultural:			
Agricultural limestone	405	3,150	7.78
Other agricultural uses	282	371	1.32
Chemical and metallurgical: Flux stone			
Other specified uses not listed ⁴	181	691	3.82
Unspecified:⁵			
Actual	7,130	31,400	4.41
Estimated	7,210	27,400	3.81
Total	28,500	114,000	4.01

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

¹Includes dolomite, granite, limestone, limestone-dolomite, miscellaneous stone, sandstone and quartzite, and traprock; excludes quartzite value from State total to avoid disclosing company proprietary data.

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

³Includes drain fields, roofing granules, and terrazzo and exposed aggregate.

⁴Includes disinfectant and animal sanitation, and lime manufacture.

⁵Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 3
WISCONSIN: CRUSHED STONE SOLD OR USED, BY KIND¹

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone ²	'19	'22,000	'\$82,600	'\$3.75	202	21,900	\$89,200	\$4.07
Dolomite	'4	'1,080	'4,460	'4.13	7	1,800	7,200	3.99
Granite	10	1,350	2,530	1.88	9	1,200	2,340	1.96
Traprock	'1	W	W	'3.98	4	1,850	7,870	4.27
Sandstone and quartzite	3	1,130	4,750	4.22	4	1,770	³ 7,660	³ 4.33
Miscellaneous stone	1	W	W	7.13	—	—	—	—
Total	XX	26,200	98,000	3.74	XX	28,500	114,000	4.01

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

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

³Includes "limestone-dolomite," reported with no distinction between the two.

⁴Excludes quartzite value.

TABLE 4
WISCONSIN: CRUSHED STONE^{1 2} SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT³

(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) ⁴	129	484	W	W	151	724
Coarse aggregate, graded ⁵	W	W	W	W	469	1,950
Fine aggregate (-3/8 inch) ⁶	W	W	W	W	219	585
Coarse and fine aggregate ⁷	2,630	10,200	W	W	2,550	8,360
Other construction materials ⁸	1,240	5,350	4,140	18,100	—	—
Agricultural ⁹	69	405	(¹⁰)	(¹⁰)	(¹⁰)	(¹⁰)
Chemical and metallurgical ¹¹	—	—	(¹⁰)	(¹⁰)	(¹⁰)	(¹⁰)
Other miscellaneous uses ¹²	—	—	—	—	(¹⁰)	(¹⁰)
Unspecified: ¹³						
Actual	941	4,280	1,140	5,150	—	—
Estimated	1,480	6,320	1,500	4,650	2,150	7,680
Total	6,490	27,100	7,080	30,200	5,740	20,100

See footnotes at end of table.

TABLE 4—Continued
WISCONSIN: CRUSHED STONE^{1 2} SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT³

(Thousand metric tons and thousand dollars)

	District 4		District 5		District 6	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:						
Coarse aggregate (+1 1/2 inch) ⁴	17	51	W	W	W	W
Coarse aggregate, graded ⁵	—	—	—	—	—	—
Fine aggregate (-3/8 inch) ⁶	10	33	9	17	—	—
Coarse and fine aggregate ⁷	1,020	2,230	W	W	W	W
Other construction materials ⁸	—	—	569	2,390	89	441
Agricultural ⁹	282	(¹⁰)	32	(¹⁰)	49	376
Chemical and metallurgical ¹¹	—	—	—	—	—	—
Other miscellaneous uses ¹²	—	—	—	—	—	—
Unspecified: ¹³						
Actual	4,950	(¹⁰)	105	(¹⁰)	—	—
Estimated	59	536	458	1,820	1,560	6,420
Total	6,330	24,700	1,170	4,930	1,690	7,240

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

¹Production reported in District 8 was included with "District 6" to avoid disclosing company proprietary data; no crushed stone was produced in District 7.

²Excludes quartzite value from State total to avoid disclosing company proprietary data.

³Data are rounded to three significant digits; may not add to totals shown.

⁴Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregate.

⁵Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregate.

⁶Includes stone sand (concrete), stone sand (bituminous mix or seal), and screening (undesignated).

⁷Includes graded road base or subbase, terrazzo and exposed aggregate, unpaved road surfacing, crusher run (select material or fill), other coarse and fine aggregates, and roofing granules.

⁸Includes drain fields.

⁹Includes agricultural limestone and other agricultural uses.

¹⁰Withheld to avoid disclosing company proprietary data; included in "Total."

¹¹Includes flux stone and lime manufacture.

¹²Includes disinfectant and animal sanitation and other specified uses not listed.

¹³Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 5
WISCONSIN: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY¹

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	7,150	\$26,900	\$3.75
Plaster and gunite sands	31	186	6.00
Concrete products (blocks, brick, pipe, decorative, etc.)	288	1,330	4.61
Asphaltic concrete aggregates and other bituminous mixtures	1,610	4,980	3.08
Road base and coverings ²	4,520	11,200	2.49
Fill	1,300	2,280	1.76
Snow and ice control	135	471	3.49
Railroad ballast	5	21	4.20
Roofing granules	16	97	6.06
Filtration	47	129	2.74
Other	34	159	4.68
Unspecified: ³			
Actual	7,740	23,000	2.97
Estimated	6,350	20,800	3.28
Total or average	29,200	91,500	3.13

¹Data are rounded to three significant digits; may not add to totals shown.

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

³Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 6
WISCONSIN: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, 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	649	3,010	3,410	13,200	1,660	5,260
Asphaltic concrete aggregates and road base materials ³	1,280	3,610	1,970	4,910	1,430	3,020
Snow and ice control	13	52	59	253	5	11
Railroad ballast	—	—	—	—	—	—
Other miscellaneous uses ⁴	15	89	32	100	14	89
Unspecified: ⁵						
Actual	1,730	5,500	4,830	14,000	—	—
Estimated	228	680	2,590	9,400	1,080	2,470
Total	3,910	12,900	12,900	41,800	4,190	10,800
	District 4		District 5		District 6	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products ²	158	691	W	W	1,020	3,540
Asphaltic concrete aggregates and road base materials ³	218	481	17	45	1,200	2,750
Snow and ice control	—	—	W	W	16	31
Railroad ballast	—	—	—	—	—	—
Other miscellaneous uses ⁴	18	40	—	—	—	—
Unspecified: ⁵						
Actual	296	668	74	122	7	39
Estimated	287	859	25	57	1,030	3,950
Total	977	2,740	312	1,490	3,270	10,300
	District 7		District 8		Unspecified within all districts	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products ²	W	W	286	1,090	—	—
Asphaltic concrete aggregates and road base materials ³	428	929	791	2,500	W	W
Snow and ice control	W	W	W	W	—	—
Railroad ballast	—	—	5	21	—	—
Other miscellaneous uses ⁴	W	W	W	W	—	—
Unspecified: ⁵						
Actual	27	73	16	88	W	W
Estimated	591	1,500	518	1,910	—	—
Total	1,190	2,980	1,630	5,650	864	2,770

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

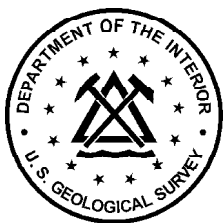
¹Data are rounded to three significant digits; may not add to totals shown.

²Includes plaster and gunite sands.

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

⁴Includes filtration and roofing granules.

⁵Includes production reported without a breakdown by end use and estimates for nonrespondents.



U. S. Geological Survey Minerals Information

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