

SELECTED DEVELOPMENTS IN WISCONSIN'S MINERAL INDUSTRY IN 1993

Thomas J. Evans 1994

In 1993, the mineral industry in Wisconsin experienced a decline from the previous year's record level of mineral production, the start of the Flambeau Mine (the state's first new metallic mine in more than 25 years), continuing interest on the part of some legislators to modify the state's metallic mining regulations, and the adoption of a statewide regulatory program for nonmetallic minerals. The trend of increasing numbers of mineral-lease terminations observed in 1992 continued in 1993; near-record low amounts of acreage were newly leased for mineral exploration.

WISCONSIN NONFUEL MINERAL PRODUCTION

Nonfuel mineral production in Wisconsin during 1993 declined more than 10 percent (about \$23 million) from the previous year's record levels, dropping to slightly more than \$200 million (table 1). The totals in table 1, however, did not include values related to copper, gold, and silver from the Flambeau Mine, which began production in June 1993. The leading mineral produced in Wisconsin for the year in terms of value was crushed stone, at nearly \$89 million. The leading mineral commodity in terms of the quantity of production was construction sand and gravel: nearly 29 million short tons were produced and sold. Lime, valued at more than \$29 million for the less than 600,000 tons produced (average value of \$51 per ton), was the third leading commodity produced in 1993. Wisconsin's \$200 million in total nonfuel mineral production ranked the state 38th in the nation.

Nonfuel mineral production statistics are collected on a voluntary basis directly from producers by the U.S. Bureau of Mines (USBM). The Wisconsin Geological and Natural History Survey assists the USBM in gathering mineral statistics under a memorandum of understanding.

ACTIONS WITH POLICY IMPLICATIONS

Metallic mining legislation submitted for consideration. Four bills drafted and introduced in 1993 proposed to modify the state's regulatory program for metallic mining operations. At the end of 1993, legislative activity on the four bills was proceeding, but their ultimate passage in the Legislature was in doubt.

- Assembly Bill 341 would eliminate existing statutory language that mandates separate ground-water-quality enforcement standards for metallic mining activities and facilities. The Wisconsin Department of Natural Resources (DNR), under current law, establishes standards specific to a particular mining proposal under the requirements of chs. NR 132 and NR 182, Wis. Admin. Code. AB 341 would require that mining activities be regulated with respect to groundwater quality in a manner consistent with other regulated activities under ch. NR 160.

- Assembly Bill 471 would prohibit metallic and nonmetallic mining activities on state-owned land managed by the DNR. Similar proposals in previous legislative sessions have been introduced but either have not been passed by the Legislature or were vetoed by the Governor.

- Assembly Bill 542 was introduced to allow further consideration of a mining-permit applicant's previous history of compliance with environmental regulations in the United States and in Canada within the last 10 years. AB 542 would extend the requirements passed recently in 1991 Wisconsin Act 260 by requiring permit applicants to supply information on environmental violations resulting in fines or forfeitures exceeding \$10,000 (U.S. currency) or, if assessed in Canada, \$10,000 (Canadian currency). Provisions under existing law allowing for the submission of plans to prevent the occurrence of similar

environmental problems would also be eliminated by this proposal. The bill would require the DNR to deny a mining permit to any applicant who, by previous actions, has demonstrated an unwillingness or inability to comply with environmental protection laws.

■ Assembly Bill 732, under existing laws unrelated to mining, would require an applicant to disclose the presence and use of toxic and hazardous materials as a part of a mining operation. Although such information is available under ch. NR 132, this proposal would eliminate the exemption of mining activities and facilities from the reporting requirement to which other activities involving such materials are currently subject.

Statewide nonmetallic-mining regulation proposed. Assembly Bill 498 would require the DNR to adopt administrative rules for the regulation of nonmetallic mining. Nonmetallic mining activities and facilities are not regulated by the state except where such activities and facilities are located within 500 feet of navigable waters. Because such "lowland op-

erations" are estimated to account for about 10 percent of Wisconsin's nonmetallic mining industry, the remaining 90 percent of sand and gravel, crushed stone, dimension stone, and industrial sand operations is regulated only by local ordinances, if at all. Established federal and state health and safety requirements, including blasting controls and worker-safety rules, would continue to apply to these operations throughout the state. AB 498 would establish a Nonmetallic Mining Council to advise the DNR about the development of the complex administrative rules necessary to implement the nonmetallic mining reclamation and operation objectives of the proposed legislation. At the end of 1993, the passage of AB 498 remained in question but was believed to be possible as a result of the interest shared by industry, environmental groups, local citizen groups, and local governmental authorities in its eventual adoption.

Mining Impact Fund rules adopted. 1991 Wisconsin Act 259 modified the requirements for persons interested in developing a metallic mine and who sub-

Table 1. Nonfuel mineral production in Wisconsin, 1991-93¹

Mineral	Quantity (in thousand short tons)	Value (in millions of dollars)	Quantity (in thousand short tons)	Value (in millions of dollars)	Quantity (in thousand short tons)	Value (in millions of dollars)
Lime	536	\$23.225	506	\$21.925	569	\$29.030
Peat	9	227	62	0.553	63	0.504
Sand and gravel						
<i>Construction</i>	29,600 ²	77.500 ²	29,118	77.066	28,700 ²	77.500 ²
<i>Industrial</i>	W ³	W	1,374	24.639	W	W
Stone						
<i>Crushed</i>	23,676	80.475	25,500	89.300	24,700	88.900
<i>Dimension</i>	61	6.221	56	5.827	60	4.316
Combined value of other industrial minerals and values indicated by symbol W	NA ⁴	27.534	NA	W	NA	W
Total	NA	\$215.724	NA	\$223.969 ⁵	NA	\$200.250 ⁵

¹ Production as measured by mine shipments, sales, or marketable production (including consumption by producers). Figures for 1993 are preliminary and do not include copper or gold production from the Flambeau Mine.

² Estimated.

³ Withheld to avoid disclosing company proprietary data; value included with "Combined value" figure.

⁴ Not applicable.

⁵ Partial total; excludes values that must be concealed to avoid disclosing company proprietary data.

mit a *Notice of Intent to Collect Data to Support a Mine-Permit Application* (NOI). In response to Act 259, the Mining Investment and Local Impact Fund Board adopted new administrative rules to regulate the disbursement of NOI funds to eligible counties, towns, villages, cities, and tribal governments. Act 259 established a requirement that NOI filers must pay up to \$150,000 to support local community activities related to possible mine development. In response to this change in the statute, the Board modified its administrative rules, Tax 13, and established procedures to administer these payments, including the timing of required payments, how eligible municipalities may receive payments of NOI funds, what expenses are covered, what information is necessary to trigger the NOI funding activity, and how undistributed funds are to be handled by the Board. The NOI funding is earmarked to support eligible municipalities in the negotiation and development of local agreement(s) with a potential mining-permit applicant; this funding is distributed primarily on a cost-reimbursement basis for expenses incurred during the negotiation of local agreements.

METALLIC MINERAL DEVELOPMENTS

Flambeau Mine production begins. The Flambeau Mining Company completed its initial site-construction activities in 1993 and began the extraction and shipping of high-grade copper and gold ore at mid-year. The 1.9-million-ton orebody averages in excess of 10 percent copper metal with lesser amounts of gold (0.1 ounce/ton) and silver (2.1 ounces/ton). The first shipment of gold-bearing gossan ore was made on May 12, 1993; the initial shipment of dominantly copper ore occurred on June 23, 1993. Flambeau Mine was officially opened in dedication ceremonies on July 31, 1993.

In the course of the year, approximately 237,000 short tons of ore were shipped (fig. 1). The gossan ore, which tends to be enriched in gold, was shipped to a smelter owned by Noranda Exploration, Inc. at Rouyn, Quebec, and the copper ore was sent to be processed at Timmins, Ontario. A third category of ore, an enriched copper ore, was also shipped for direct smelting at Rouyn.

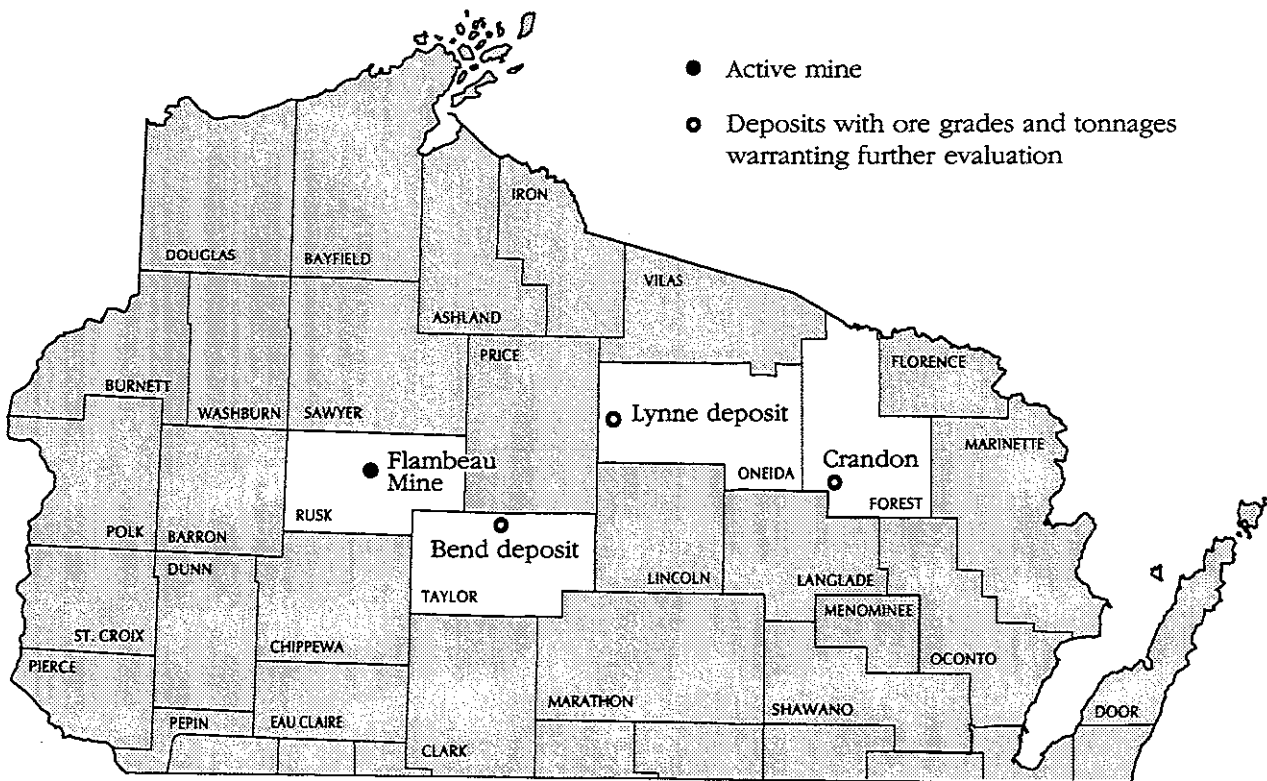


Figure 1. Sites of major metallic mineral projects in Wisconsin.

Crandon Mine project evaluation underway.

Exxon Coal and Minerals Co. and Rio Algom Ltd. formed a partnership known as Crandon Mining Company to begin the process of evaluation of the Crandon massive-sulfide zinc-copper orebody in Forest County. The equal partnership was announced in September and, at the end of 1993, initial technical evaluations began in conjunction with the principal contractor, Foth and Van Dyke of Green Bay, Wisconsin. The filing of the NOI was expected in early 1994.

The Crandon orebody was the subject of a mining proposal in the early 1980s under the sole ownership of Exxon Coal and Minerals Co. Permit applications were withdrawn in late 1986, however, in response to the weak international metal markets existing at that time. This project will essentially begin the permitting process anew, including the development of a new environmental impact statement. This process, once initiated with the filing of an NOI, will take about four years to complete.

Crandon Mining Company anticipates recoverable ore reserves of 30 million tons, averaging 9.4

percent zinc and 0.4 percent copper. This quantity of ore is projected for development over the first 15 years of operation. An additional 25-million tons of enriched copper ore is available, providing that favorable economic market conditions exist. The initial 15-year mining phase would begin following the 2- to 3-year construction period for the underground mine. The mining rate is projected at 5,500 tons/day; on-site processing of the ore can produce separate concentrates of copper, zinc, and lead.

Lynne Project suspended. On October 20, 1993, Noranda Minerals-Wisconsin Corp. announced the indefinite suspension of activities related to the development of a zinc-rich massive-sulfide deposit in Oneida County. The proposed project was to be an open-pit mine developing a 5.8-million-ton orebody on Oneida County-owned land south of the Willow Flowage. The orebody was discovered in 1990; an NOI was filed for the proposed mine in 1992.

The company's decision to suspend permitting activities was related to the identification by the DNR of the presence of small lakes in the immediate vi-

Table 2. New acreage acquired for metallic mineral exploration and acreage for which leases or options were terminated, by county and company, in 1993¹

Company	BHP-Utah International, Inc.		Cominco American Resources Co.		E.K. Lehmann and Associates of Wisconsin		Jump River Joint Venture ²		Noranda Exploration, Inc.		Phelps Dodge Exploration East, Inc.		Totals ³	
	Leased	Term.	Leased	Term.	Leased	Term.	Leased	Term.	Leased	Term.	Leased	Term.	Leased	Term.
County														
Florence	80	0	0	0	0	0	0	0	0	0	0	0	80	0
Forest	0	0	0	0	0	0	0	0	0	3,760	0	0	0	3,760
Iron	0	0	161	1,600	0	0	0	0	0	0	0	0	161	1,600
Langlade	0	0	0	120	0	0	0	0	0	0	484	0	484	120
Lincoln	0	0	120	0	0	800	0	505	0	1,232	0	1,143	120	3,680
Marathon	0	142	0	0	0	0	0	0	0	0	0	0	0	142
Marinette	0	0	0	0	0	0	0	0	0	6,383	0	0	0	6,383
Oneida	0	0	720	0	0	0	0	1,296	0	240	0	0	720	1,536
Price	0	0	0	340	0	7,116	0	0	0	3,000	0	0	0	10,457
Rusk	0	0	0	0	0	634	0	0	0	0	0	0	0	634
Taylor	0	0	0	0	0	840	0	1,760 ⁴	0	0	0	767 ⁴	0	3,366 ⁴
Totals⁴	80	142	1,001	2,060	0	9,390	0	3,561	0	14,615	484	1,910	1,565	31,678

¹ Acreage shown has been rounded off to the nearest whole acre.

² Jump River Joint Venture total includes transactions by Cypress Gold Exploration Corporation.

³ Numbers in columns may not add up to indicated total due to independent rounding of individual county figures.

⁴ Figures include some previously unreported 1992 figures.

cinity of the proposed mining area. The regulations in Wisconsin preclude mining activity if lake (and lake beds) would be irreparably damaged or destroyed. The DNR determination that lake beds were present in the project area necessitated re-evaluation of the project's permitting schedule and economic viability in light of what Noranda Minerals-Wisconsin Corp. referred to as "currently weak metals markets [and] difficult economic times." The suspension of Lynne Project activity brought to an end all Wisconsin activities of Noranda Inc. (the parent company of Noranda Exploration, Inc. and Noranda Minerals-Wisconsin Corp.).

Bend Project awaits financing. The Jump River Joint Venture (JRJV), a consortium of companies interested in further exploration and possible development of the Bend deposit in north-central Taylor County, was seeking additional financial support during 1993. Asarco Inc. left the JRJV and assigned all of its interests to Cyprus Mining Company. At the end of 1993, Cyprus was discussing new financial arrangements with Sharpe Energy and Resources, of

Toronto, Canada, in an effort to maintain the project's economic viability. The 3- to 5-million ton copper-gold massive-sulfide deposit was discovered in 1985 on mineral holdings owned by the federal government in the Chequamegon National Forest.

NONMETALLIC MINERAL DEVELOPMENTS

Assembly Bill 498, discussed previously, was the major activity regarding nonmetallic mining in Wisconsin in 1993. The potential for statewide regulation of nonmetallic-mining operations and reclamation comes in the context of growing public awareness in the state regarding the relationship of sand and gravel pit operations and stone quarry development to the interests and concerns of surrounding urban and suburban development areas. The U.S. Bureau of Mines identified several permitting decisions involving quarry opening, re-opening, or expansion that occurred in the state during the year.

MINERAL LEASING AND EXPLORATION ACTIVITY

Leasing for metallic minerals at near-record low. Recording of mineral lease or option agreements for new acreage in 1993 was a near-record low level (table 2). Since mandatory recording of metallic mineral leases began in 1978, only in the years 1985 and 1986 has the level of activity been so limited (table 3). Significant areas of land holdings under previous lease or option agreements were terminated during 1993. Nearly 32,000 acres were specifically terminated from prior agreements. The significant volume of lease terminations reflects the 1992 decision by Noranda Exploration, Inc. to cease its operations in Wisconsin and the decision by E.K. Lehmann and Associates of Wisconsin to divest its mineral holdings in the state. E.K. Lehmann and Associates of Wisconsin and Noranda Exploration, Inc. had been long-standing, active exploration firms interested in the massive-sulfide areas of northern Wisconsin. BHP-Utah International, Inc., Cominco American Resources Co., and Phelps Dodge Exploration East, Inc. acquired new land holdings during the year, but the total new acreage was less than 1,600 acres.

Minor oil and gas leasing by individuals occurred in Kewaunee and Door Counties in 1993 (table 3).

Table 3. New mineral acreage contracted for leasing, by year¹

Year	Metallic mineral transactions (total new acreage)	Oil and gas transactions (total new acreage)
1978	81,596	-
1979	16,417	-
1980	51,211	-
1981	29,465	-
1982	18,489	-
1983	14,099	24,002
1984	3,136	196,408
1985	1,270	479,012
1986	1,566	19,335
1987	10,122	18,029
1988	7,137	-
1989	19,524	-
1990	33,555	-
1991	49,075	16,261
1992	55,605 ²	14,618
1993	1,565	1,284

¹ Totals shown do not indicate land currently under lease due to terminations of leases and lapse of the term of the lease.

² Total shown includes a single transaction of 41,675 acres in Forest County.

Table 4. Metallic mineral exploration summary, 1989-93

	1989	1990	1991	1992	1993
Companies licensed to drill ¹	8	8	9	8	8
Newly licensed companies ¹	0	1	3	0	2
Companies conducting drilling programs	4	3	4	6	4
Total counties with drilling activity	6	2	8	8	5
Total holes drilled (development drilling) ²	45 (0)	72 (68)	128 (111)	24 (7)	18 (10)
Total footage drilled (development drilling)	26,937 (0)	35,875 (33,852)	94,321 (84,179)	22,585 (11,005)	10,492 (4,493)
Total bedrock footage (development drilling)	23,935 (0)	30,862 (28,887)	85,317 (81,146)	19,332 (10,055)	7,405 (3,543)

¹ An exploration license for metallic minerals may be obtained at any time, but expires July 1. These totals include companies licensed for all or part of the indicated calendar year.

² Numbers in parentheses refer to drilling at known mineral deposits. Totals include figures shown for development drilling.

Table 5. Metallic mineral exploration in 1993, by company and county

		Drillholes	Bedrock footage	Total footage
Company	BHP-Utah International, Inc.	4	2,167	2,553
	Cominco American Resources Co.	3	946	1,350
	Crandon Mining Company	10	3,862	5,999
	Phelps Dodge Exploration East, Inc.	1	430	590
Total		18	7,405	10,492
County	Forest	10	3,862	5,999
	Langlade	1	430	590
	Lincoln	1	280	400
	Marinette	4	2,167	2,553
	Oneida	2	666	950
Total		18	7,405	10,492

Table 6. Mineral exploration licensees, 1993¹

License number	Company	License number	Company
1	Exxon Coal and Minerals Co.	33	Phelps Dodge Exploration East, Inc.
3	Noranda Exploration, Inc. ²	34	Cominco American Resources Co.
5	E.K. Lehmann and Associates of Wisconsin, Inc.	36	Cypress Gold Exploration Corporation
28	BHP-Utah International, Inc.	37	Crandon Mining Company

¹ Companies listed were licensed to explore for metallic minerals or oil and gas in Wisconsin for all or part of 1993. License numbers not listed represent licenses issued previously to companies that did not renew their license for any part of the 1993 calendar year. No individuals or companies were licensed for oil and gas exploration during the 1993 calendar year.

² License not renewed for license year July 1993 to June 1994.

Metallic mineral exploration down sharply.

Four companies conducted exploratory drilling programs in Wisconsin during the year. Total footage drilled was down as was bedrock footage (tables 4 and 5). The number of drillholes was at a near-record low (18), particularly in light of the fact that ten of these holes were actually constructed for deposit-evaluation purposes (development drilling) on

the Crandon orebody in Forest County. Crandon Mining Company and Cyprus Gold Exploration Corporation (formerly a part of the Jump River Joint Venture) were newly licensed for metallic mineral exploration (table 6).

No persons or companies were licensed for oil and gas exploration in calendar year 1993.

Figure 2 shows the distribution of metallic mineral and oil and gas exploratory drilling in Wisconsin from 1917 through 1993. ■

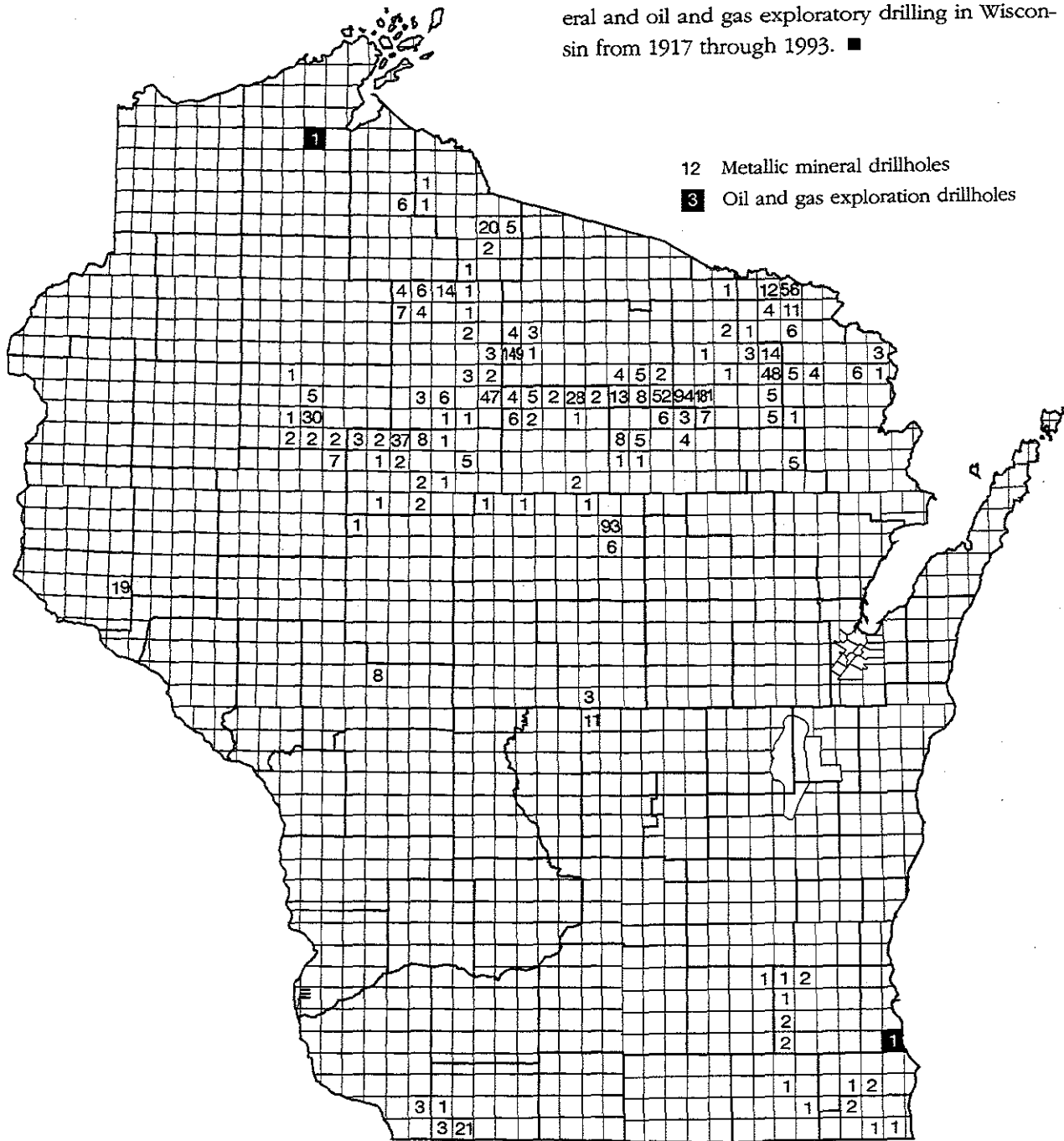


Figure 2. Metallic mineral exploration in Wisconsin, by township, 1977-93. The number of drillholes constructed in a township is shown. All drillhole data are from public records (drillhole abandonment reports submitted by mineral exploration companies to the Wisconsin Department of Natural Resources).

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