

SELECTED DEVELOPMENTS IN WISCONSIN'S MINERAL INDUSTRY IN 1989

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1990

Introduction

Highlighted in this report are those developments in calendar year 1989 that most significantly affect the evaluation and development of the state's metallic and nonmetallic mineral resources. This report is not meant to be a comprehensive assessment of Wisconsin's mineral industry.

Included in this year's report are summaries of 1) major actions of state and local government related to nonmetallic and metallic mineral access and development, 2) nonmetallic mineral production in 1989, and 3) metallic mineral exploration and leasing activity.

General legislation and other governmental actions

State legislation. Two bills potentially affecting Wisconsin's mineral industry were introduced in the State Legislature in 1989. Bill AB 17, relating to the transportation of bulk loads on a highway, was introduced in January and was referred to the Assembly Committee on Highways, which held a hearing in March. No further action was taken on this bill, which would have required truckloads of stone, sand, or gravel to be fully covered during shipment. Bill SB 362 was introduced in November; this bill would ban mining on land owned by the state and under the jurisdiction of the Wisconsin Department of Natural Resources (DNR). Crushed stone, sand, and gravel mining were exempted from the bill, which was referred to the Senate Committee on Transportation, Conservation, and Mining. No action had been taken by year-end, although a companion version of the bill, AB 756, was introduced and will be receiving attention in early 1990.

DNR mining study. The Natural Resources Board, at its June meeting, directed staff of the DNR to prepare a report for the Board about mining on state lands managed by the DNR. The Board was responding to recent interest in talc mining in the Mead Wildlife Area of northwestern Wood County and a solicitation of leasing interest on land in the Potato Creek Wildlife Management Area in Rusk County for which the DNR holds rights to 50 percent of the minerals. During the summer, internal DNR staff committees looked at various aspects of the issue. A partial report focusing on DNR statutory authority, as related to mineral activities, was provided to the Board in September. The report contained the DNR staff opinion that the statutes appear not to provide broad authority for mineral exploration and development and provide only limited explicit authority on some land. The Board voted to cease further evaluation of the issues and not to seek broader or more explicit authority regarding mining on public lands at this time.

Developments specific to nonmetallic minerals

Marathon County ordinance. The Marathon County ordinance relating to nonmetallic mineral operations, originally enacted in 1988, was revised and finally adopted in February. Changes in the ordinance focused primarily on the manner in which permit fees were to be assessed. The new ordinance regulates nonmetallic mining and reclamation and requires bonding to ensure compliance.

Sauk County permits. In August the Sauk County Board of Adjustments granted a special-exception permit on a 27-acre parcel of land near the Lower Narrows along Highway 33 in the Baraboo Hills (SW1/4, NW1/4, section 26, T12N, R7E). Edward Kraemer and Sons, Inc., sought the permit following its purchase of the former Baraboo Quartzite Company property; the company plans to renew operations

at the site. In 1989 the site was cleared and about 20,000 cubic yards of material was crushed, sized, and stockpiled using portable equipment. The potential markets for the quartzite mined will include roadbase aggregate, railroad ballast, and deburring media. At year-end, the company was seeking to acquire additional acreage to the north for possible quarry expansion.

In 1989 interest in quartzite extraction grew, focusing on the Baraboo and Waterloo areas. Gillen Construction Co. opened a quarry in 1988 to provide rip-rap to markets in the Chicago area. During the year, several industrial inquiries into potential quartzite resources appeared to signify growing emphasis on railroad ballast, filter-bed media beneath landfills, and high-durability rip-rap. Use of quartzite in highway-aggregate applications also appears to be receiving increased attention.

Developments specific to metallic minerals

Flambeau Mining Co. proposed open-pit copper/gold mine. Flambeau Mining Co., a subsidiary of Kennecott Copper Company, which is owned by Rio Tinto Zinc, submitted its permit applications in support of plans to develop a small, open-pit copper/gold mine south of Ladysmith in Rusk County (fig. 1). The permit applications were submitted in April and followed nearly two years of discussions with regulatory agencies regarding environmental baseline studies, data gathering, and related activities leading to completing the proposal to mine the secondary-enrichment zone of the Flambeau Deposit.

The proposed mine would be a 225-foot deep, 32-acre open-pit operation to extract up to 1.9 million tons of massive sulfide ore containing 10.5 percent copper with 0.1 ounce of gold and 2.1 ounce of silver

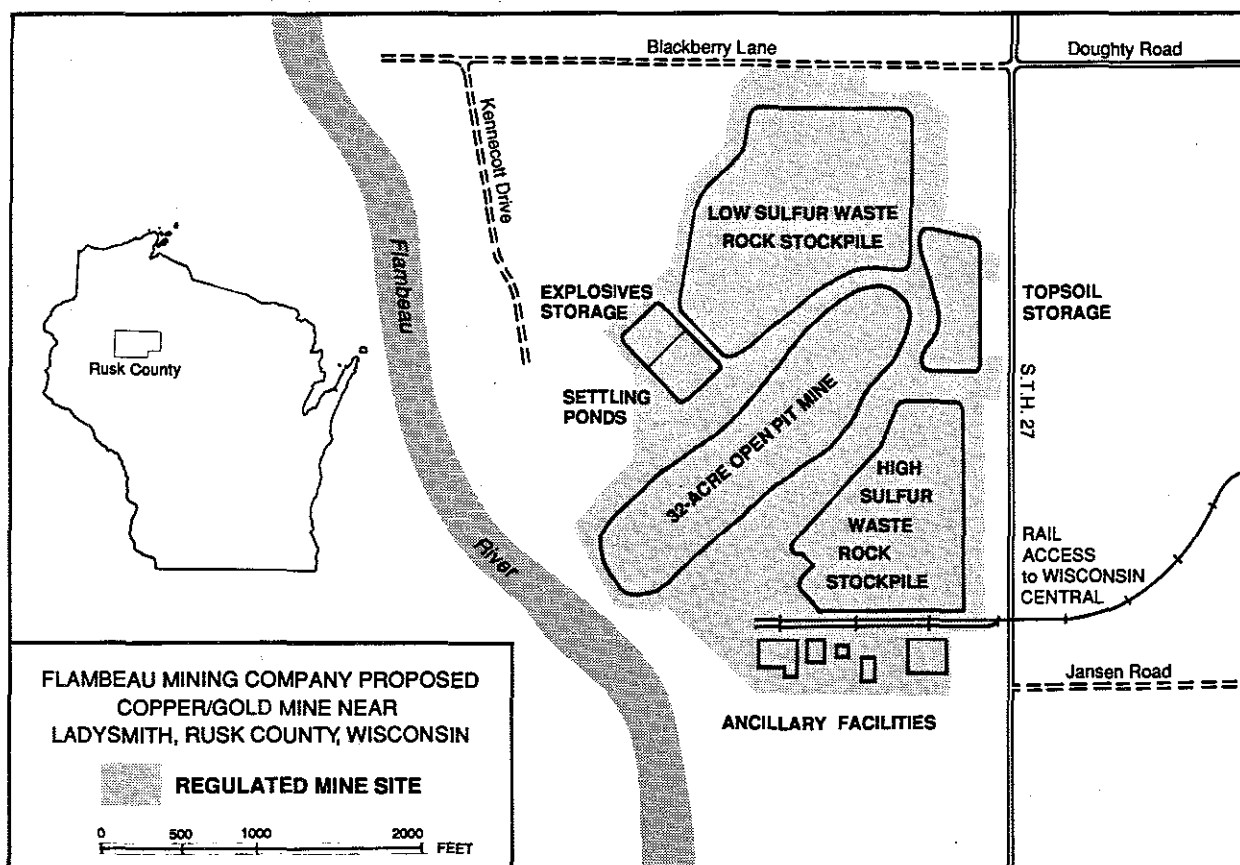


Figure 1. Flambeau Mining Company proposed copper/gold mine, near Ladysmith, Rusk County, Wisconsin.

per ton. A draft environmental impact statement (EIS) was released by the DNR in September. The final EIS is expected in March, 1990, the Master Hearing on all necessary permits, licenses, and approvals will be held in the summer of 1990. Parties to the Master Hearing include Flambeau Mining Co., the DNR, Town of Grant, City of Ladysmith, Rusk County, Lac Court Oreilles tribal government, State Public Intervenor's Office, and five environmental and conservation groups. If approved, the construction of the mine would probably start in 1991.

Oneida County leasing. Oneida County held the first competitive sale of mineral leases on county forest lands in May. More than 12,000 acres were leased as three companies entered 35 bids on 26 tracts of land. Companies submitting bids included Noranda Exploration, E.K. Lehmann and Associates of Wisconsin, and Great Lakes Exploration Co. Bidding was based on a percentage of the net proceeds liability above a minimum royalty of 3 percent net smelter returns plus 4 percent net proceeds. Following the award of the leases by action of the County Board in June, the leases were formally reviewed for compliance with environmental protection requirements by the DNR. Formal approval of the leases by the DNR, which is necessary before the leases can go into effect, was obtained in December.

Other state actions. In August the Natural Resources Board denied five petitions for rule changes related to NR 132 and NR 182, administrative rules governing metallic mining and metallic mine-waste disposal, respectively. The citizen-requested rule changes specifically dealt with a definition of "protection of public health, safety and welfare," public participation concerning exceptions and modifications, supervision of construction of a mine-waste facility by a registered professional engineer, changes related to DNR inspection of a metallic mine facility, and groundwater-quality standards for mining-waste facilities. All five petitions in substantially similar form had been submitted in 1986 and denied by the Board at that time.

At its November meeting the Board of Commissioners of Public Lands (BCPL) considered a proposal to lease 160 acres of state trust lands in the Town of Enterprise, Oneida County. The lease proposal was submitted by E.K. Lehmann and Associates of Wisconsin and was patterned after the lease used by Oneida County in its lease sale earlier in the year. A company representative gave testimony to the Board about the presence of a linear geophysical anomaly on county land leased by Lehmann that trended onto nearby state lands. The decision to approve or deny the lease was deferred until questions regarding language in the lease were clarified. Action in the lease proposal was expected in early 1990. A decision to lease state-trust lands for mineral development would be the first such action by the BCPL.

The Mining Investment and Local Impact Fund Board held its annual meeting in June to consider several minor items and to hear more about the proposed Flambeau Mining Company open-pit copper mine in Rusk County. The Board is responsible for disbursements of funds generated from net-proceeds revenues from taxation of metallic mineral operations. These funds are used to support local government planning and related costs that result from past, present, or future metal mining activity.

Other county actions. Lincoln County entered into a metallic mineral agreement with E.K. Lehmann and Associates of Wisconsin for about 800 acres of land in the county forest. The lease was negotiated by the county and the company and provides for annual acreage rental payments and royalty payments in the event of mining.

The Rusk County Board of Supervisors was approached for a lease of 520 acres of county forest lands in the Town of Big Bend. At the October meeting of the county board, the lease proposal, which had been recommended by the Forestry Committee, was denied. A subsequent attempt to approve a lease that had been rewritten to meet the Board's stated concerns was also rejected. However, in view of the complexity of issues raised in the discussions concerning the possibility of allowing mineral access, the Board has requested that a citizen's task force be formed to develop ideas, collect opinions, and make recommendations to guide future board actions in these matters. At year-end, the task force had been selected, but meetings were not scheduled until the spring of 1990.

Wisconsin mineral production

Mineral production in Wisconsin declined slightly in 1989, with a total mineral value estimated at \$201.6 million. The previous year's total of \$204.9 million was the highest since mineral statistics have been compiled by the U.S. Bureau of Mines. This preliminary determination of mineral production was contained in the latest Mineral Industry Survey, *The Mineral Industry of Wisconsin in 1989*, recently released by the U.S. Bureau of Mines. Preliminary totals for the past year include \$100.1 million for crushed stone, \$58.5 million for construction sand and gravel (estimated), \$21.8 million for lime, \$15 million for industrial sand and gravel, and \$4.2 million for dimension (building) stone. All other commodities -- gem stones, peat, and crushed trap rock -- totaled just over \$2.0 million. The slight decline of about 2 percent in 1989 as compared to 1988 was considered modest given the record-setting 1988 production value. All mineral production reported in 1989 is from nonmetallic mineral commodities; the last year of reported metallic mineral production was 1983.

Metallic mineral leasing activity

Three companies leased more than 19,500 acres of land for metallic mineral exploration in six northern Wisconsin counties in 1989 (table 1). The focus of leasing activity was Oneida County, where the competitive sale of mineral leases resulted in 12,929 acres of county forest land being made available for mineral entry. In 1989 Noranda acquired the largest acreage, most of which was associated with the Oneida County forest land. E.K. Lehmann and Associates of Wisconsin leased more than 7,200 acres of land in five counties; their largest acquisition was in the Chequamegon National Forest in Taylor County. Great Lakes Exploration leasing was confined to Oneida County. The 1989 leasing activity was the largest in terms of total acreage since 1981 and represents a 270 percent increase over the previous year's leasing activity (tables 2 and 3).

The nature of mineral-lease agreements recorded in 1989, with the exception of the Oneida County exploration and prospecting agreement, was primarily option-to-purchase agreements. In such agreements, an annual fee is paid to maintain the lease; an option to purchase the property at an agreed-to price is also included. Annual rental payments are generally in the \$5 to \$10 per acre range initially and are graduated to levels up to \$20 in the fifth year of the agreement. Royalties are typically set at 2 percent of net returns in the E.K. Lehmann leases. Noranda used "exploration right and option to purchase agree-

Table 1. New mineral acreage leased (and acreage specifically released) for metallic minerals, by county and company.

County	E.K. Lehmann & Associates of Wisconsin, Inc.		Noranda Exploration, Inc.		Great Lakes Exploration, Inc.	Total new acres	
Lincoln	885	(228) ¹				885	(228)
Marathon			1,124	(108)		1,124	(108)
Oneida	1,796	(160)	7,016 ²		4,117	12,929	(160)
Price	381	(240)				381	(240)
Rusk	826	(1,024)	0	(783)		826	(1,807)
Taylor	3,379	(2,119)				3,379	(3,119)
Total	7,267	(3,771)	8,140	(891)	4,117	19,524	(4,662)

¹ Figures in parentheses represents total acres specifically released in 1989 from acreage that had been leased in some previous year.

² Figure includes 240 acres of surface rights *only* (mineral rights held by state of Wisconsin and have not been leased).

Table 2. New mineral acreage contracted for leasing by year.

Year	Metallic mineral transactions		Oil and gas transactions
	Total new acreage	Target acreage	Total acreage
1978	81,596	7,631	
1979	16,417	11,237	
1980	51,211	22,160	
1981	29,465	9,122	
1982	18,489	9,430	
1983	14,099	5,899	24,002
1984	3,136	3,136	196,408
1985	1,270	1,270	479,012
1986	1,566	1,566	19,335
1987	10,122	4,042	18,029
1988	7,137	7,137	
1989	19,524	19,524	

Table 3. New acreage¹ of metallic mineral transactions contracted since 1978, by county.

County	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	Total ²
Barron	0	0	20	0	0	0	0	0	0	0	0	0	20
Chippewa	0	0	0	0	1,000	160	407	160	0	0	0	0	1,727
Clark	0	0	0	400	0	0	0	0	0	0	0	0	400
Florence	41,296	720	15,132	2,063	474	1,950	480	0	0	0	0	0	62,115
Forest	18,402	3,825	19,780	7,111	1,760	700	311	0	0	0	0	0	51,889
Iron	0	765	400	70	554	9,080	0	0	0	0	0	0	10,860
Jackson	0	0	0	0	565	0	0	0	0	0	0	0	565
Langlade	80	3,120	200	333	719	0	0	0	0	0	0	0	4,452
Lincoln	0	0	679	3,071	1,660	515	660	689	344	40	470	885	9,013
Marathon	80	80	1,597	848	240	200	0	0	783	370	1,554	1,124	6,876
Marinette	14,707	2,052	0	0	160	0	0	0	0	0	0	0	16,919
Oconto	0	680	0	0	0	0	0	0	0	0	0	0	680
Oneida	400	480	640	1,487	1,905	0	160	421	0	80	0	12,929	18,502
Portage	0	380	0	0	0	0	0	0	0	0	0	0	380
Price	5,945	2,265	8,586	12,603	7,740	800	840	0	10	917	0	381	40,087
Rusk	35	1,143	2,939	1,119	0	0	0	0	0	1,105	4,164	826	11,331
Sawyer	0	0	758	0	640	0	0	0	0	0	0	0	1,398
Taylor	200	566	480	360	1,077	627	278	0	429	7,610	950	3,379	15,956
Vilas	0	0	0	0	0	67	0	0	0	0	0	0	67
Waushara	451	350	0	0	0	0	0	0	0	0	0	0	801
Grand total²	81,596	16,417	51,211	29,456	18,494	14,099	3,136	1,270	1,566	10,122	7,137	19,524	254,037

¹ Only NEW acreage leased is shown. Terminations of lease agreements are *not* included in table. Acreage totals do *not* indicate acreage currently under lease.

² Numbers in columns may not add up to indicated total because of independent rounding of individual county figures.

ments" in 1989 that did not include retained royalties but annual lease payments that were a percentage of the agreed-to purchase price of the land, resulting in a generally higher annual payment on a per-acre basis.

Lease terms, such as those described here, and all aspects of mineral leases are fully negotiable between the parties involved. The use of different lease formats reflects not only individual company practice, but also mineral-rights owners' individual preferences.

Federal leasing/drilling actions. Three exploratory holes were drilled in the Chequamegon National Forest in Taylor County in 1989 and six additional drilling applications were filed for that area during the year. New "prospecting permits" (essentially exploration agreements) covered 3,059 acres; 11 other permit applications, covering more than 5,289 acres, were pending at year-end. Two of these permits were in Ashland County; the remaining nine were in Taylor County.

Metallic mineral exploration activity

Four companies out of the eight that were licensed to explore (drill) for metallic minerals in Wisconsin in 1989 actually were involved in drilling programs. Although five companies were involved in exploration in 1988, the total footage drilled in 1989 was more than 14 percent greater than in 1988; total footage drilled in bedrock was nearly 26 percent greater compared to 1988. The total of 45 holes was down slightly (see tables 4, 5, and 6; fig. 2).

The four companies engaged in active exploration in 1989 include Noranda Exploration, which completed 32 of its 33 holes in the area of the Town of Easton in Marathon County. This is a gold prospect that was first publicly mentioned in a 1987 *Canadian Mining Journal* article about Noranda. Chevron Resources completed six of its seven holes in its Chequamegon National Forest holdings in Taylor County, principally for what is known as the Bend Project. E.K. Lehmann drilled holes in Rusk and Lincoln Counties; Newmont Exploration apparently completed its exploration activity in Wisconsin early in 1989 by drilling two holes in the Mercer area of Iron County. Newmont has since released most of its Wisconsin core to the Wisconsin Geological and Natural History Survey.

Exploration in 1989 remained centered in areas of past drilling activity (fig. 3). Exploration in 1990 is expected to reflect interest in Oneida County, as shown by the leasing of county forest lands.

Oil and gas activity

Douglas County offered its county forest lands for lease for exploration and development of oil and gas resources. Just less than 300,000 acres were put up for bidding, which was concluded in September. Two oil and gas exploration proposals were received, but the county declined the bids, which were viewed as too low to be acceptable, and rejected further consideration of leasing at this time. Currently, more than 430,000 acres in the state remain under lease for possible oil and gas exploration and development. No new acreage was leased in 1989 and no additional geophysical surveying was completed during the year. The future of oil and gas activity in Wisconsin is uncertain at this time.

Table 4. Five-year metallic mineral exploration summary.

	1985	1986	1987	1988	1989
Companies licensed to drill ¹	16	11	10	9	8
Newly licensed companies ¹	1	2	1	1	0
Companies conducting drilling programs	5	4	3	5	4
Total counties with drilling activity	7	6	4	5	6
Total holes drilled (development drilling) ²	24 (4)	23 (0)	32 (9)	48 (19)	45 (0)
Total footage drilled (development drilling) ²	19,444 (4,753)	15,480 (0)	20,220 (2,324)	23,577 (2,258)	26,937 (0)
Total bedrock footage (development drilling) ²	15,944 (4,343)	13,390 (0)	17,710 (338)	19,697 (1,239)	23,935 (0)

¹ An exploration license may be obtained at any time, but expires July 1st. This total includes companies licensed all or part of the indicated calendar year.

² Numbers in parentheses refer to development drilling (exploration drilling completed at sites of announced mineral deposits). Totals for development drilling are included in the totals not listed in parentheses.

Table 5. Metallic mineral exploration by company and county, 1989.

Company [license number]	Drillholes	Bedrock footage	Total footage
Chevron Resources Co. [29]	7	5,420	6,285
E.K. Lehmann and Associates of Wisconsin, Inc. [5]	3	1,556	1,834
Newmont Exploration [31]	2	765	1,254
Noranda Exploration Inc. [3]	33	16,194	17,564
Total	45	23,935	26,937

County	Drillholes	Bedrock footage	Total footage
Iron	2	765	1,254
Lincoln	1	317	529
Marathon	32	15,910	17,206
Oneida	1	647	663
Rusk	3	1,060	1,372
Taylor	6	5,236	5,913
Total	45	23,935	26,937

Table 6. Metallic mineral exploration licensees, 1989¹

License number	Company	License number	Company
1	Exxon Minerals Company	17	Kerr-McGee Resources Corporation
3	Noranda Exploration, Inc.	28	Utah International, Inc.
5	E.K. Lehmann and Associates of Wisconsin, Inc.	29	Chevron Resources Co.
9	American Copper and Nickel Co., Inc.	31	Newmont Exploration Limited ²

¹ Companies listed were licensed to explore for metallic minerals in Wisconsin for all or part of 1989. License numbers not listed represent licenses issued previously to companies that did not renew their license for any part of the 1989 calendar year.

² This company did not renew its license for the July 1989 to June 1990 license year.

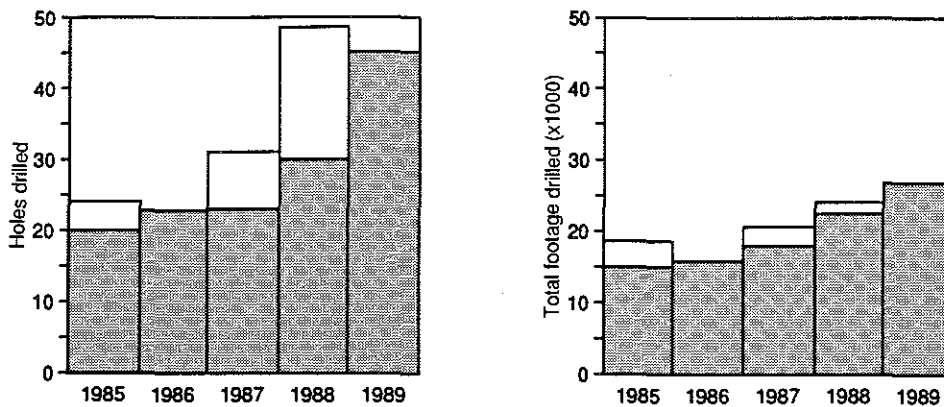


Figure 2. Exploration drilling in Wisconsin, 1984-89. Screened part of bar graph represents non-developmental exploration drilling; nonscreened part represents development drilling on known mineral deposits.

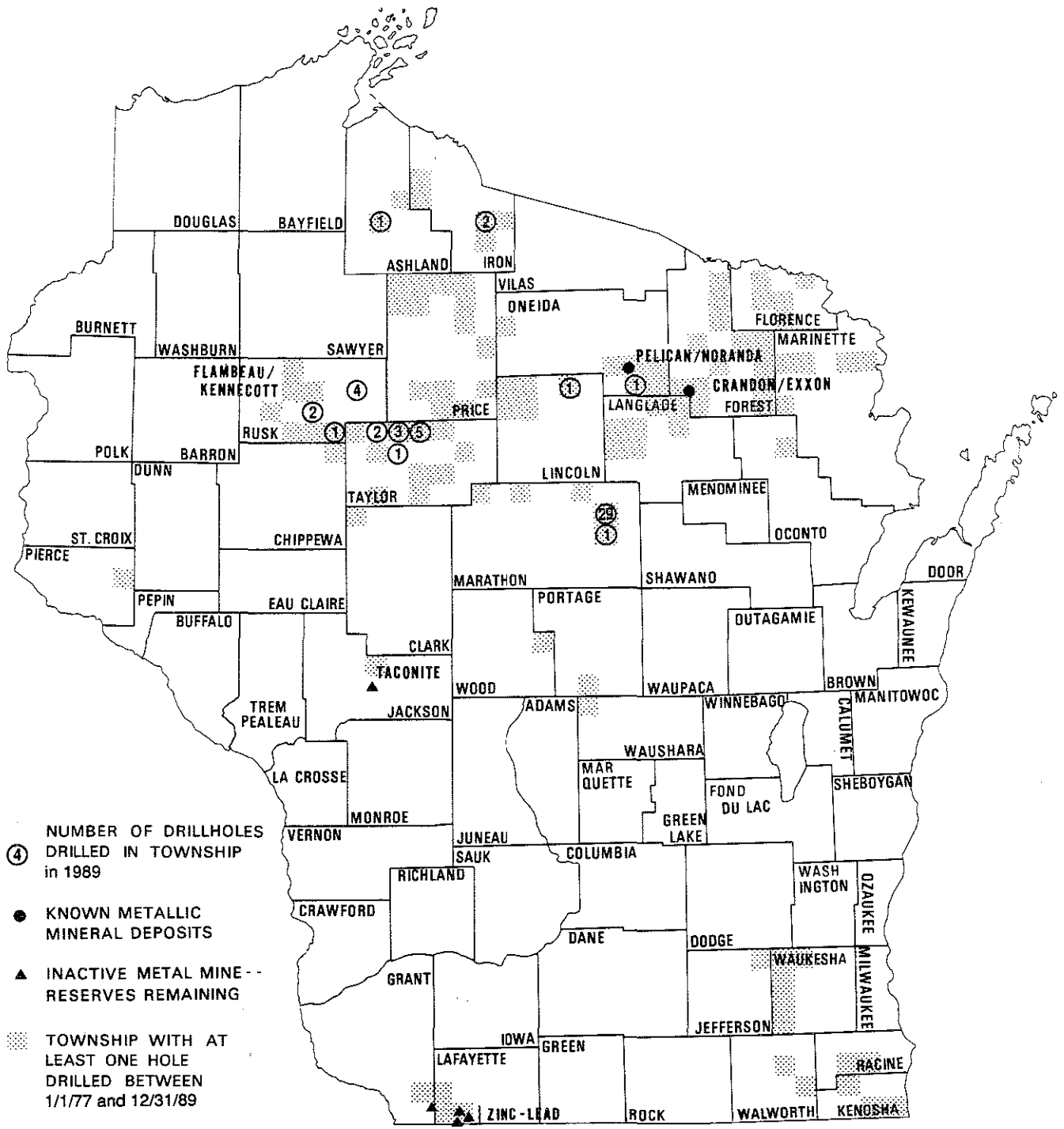


Figure 3. Metallic mineral exploration in Wisconsin, 1977-89. All drillhole data are from public records -- from drillhole abandonment reports submitted by metallic mineral exploration companies to the Wisconsin Department of Natural Resources.

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