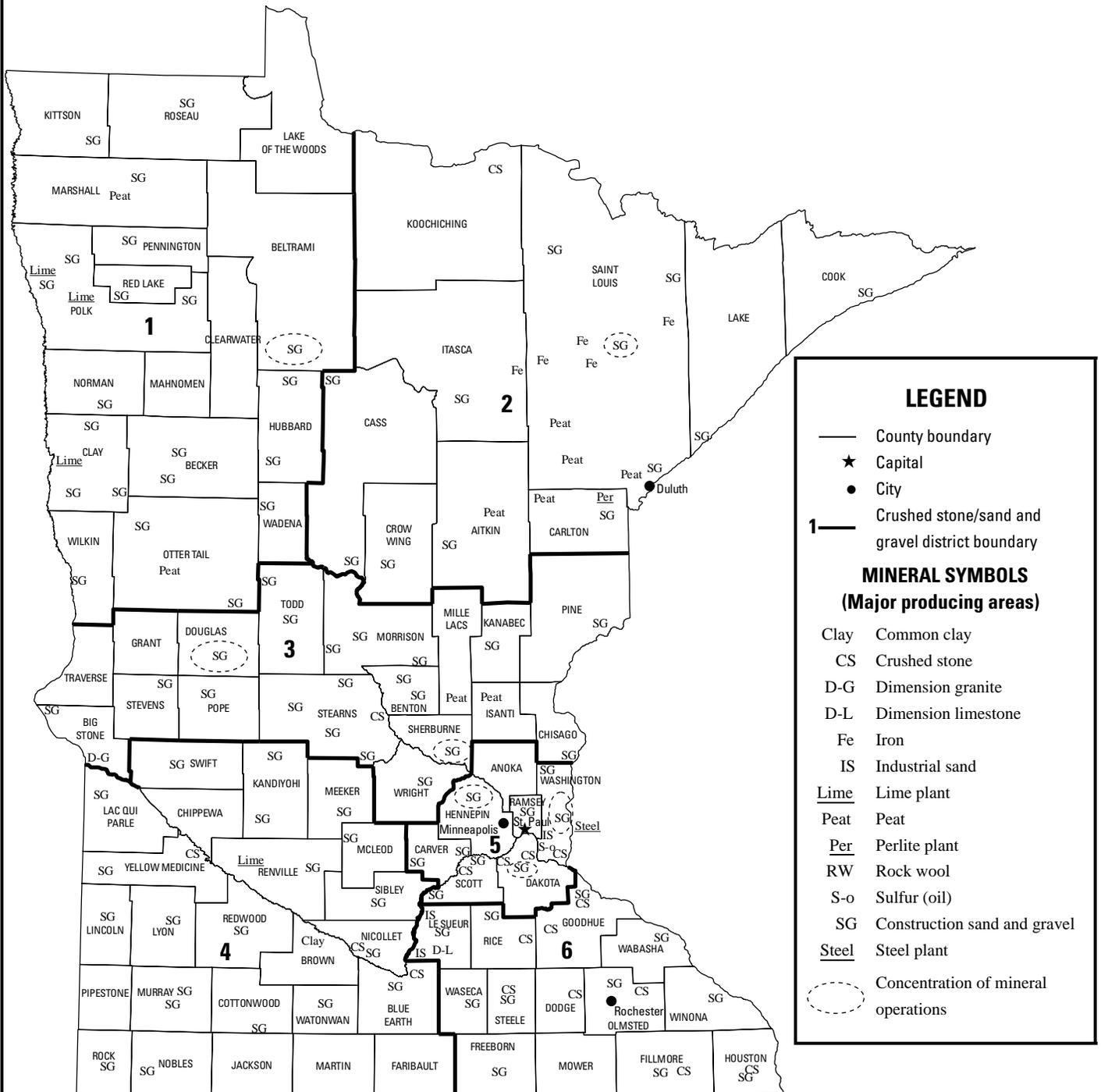




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MINNESOTA

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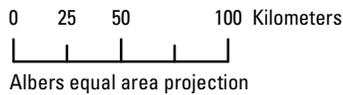


LEGEND

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

**MINERAL SYMBOLS
(Major producing areas)**

- Clay Common clay
- CS Crushed stone
- D-G Dimension granite
- D-L Dimension limestone
- Fe Iron
- IS Industrial sand
- Lime Lime plant
- Peat Peat
- Per Perlite plant
- RW Rock wool
- S-o Sulfur (oil)
- SG Construction sand and gravel
- Steel Steel plant
- Concentration of mineral operations



Source: Minnesota Department of Natural Resources, Division of Lands and Minerals/U.S. Geological Survey (2006).

THE MINERAL INDUSTRY MINNESOTA

In 2006, Minnesota's nonfuel raw mineral production¹ was valued at \$2.54 billion, based upon annual U.S. Geological Survey (USGS) data. This was a \$350 million, or 16%, increase from the State's total nonfuel mineral value for 2005, which had increased by \$310 million, or 16.5%, from 2004 to 2005. Minnesota ranked eighth (seventh in 2005) among the 50 States in total nonfuel mineral production value, and the State accounted for nearly 4% of the U.S. total. [Because data for industrial sand and gravel and lime have been withheld (company proprietary data), the actual total values for 2004–06 are noticeably higher than those reported in table 1.]

Minnesota continued to be the Nation's leading iron ore-producing State in 2006, and, based upon value, iron ore continued to be the State's leading nonfuel mineral, accounting for nearly 85% of its total nonfuel mineral production value. Iron ore was followed by construction sand and gravel, crushed stone, industrial sand and gravel, dimension stone, lime, peat, common clays, and gemstones (in descending order of value).

In 2006, for the third consecutive year, the State's substantial increase in nonfuel raw mineral production value largely resulted from iron ore's considerably higher average price per metric ton (t) compared with that of 2005. In 2006, despite a slight decrease (less than 1%) in the shipments of usable iron ore, the commodity's value increased by more than \$330 million, or by 18%, compared with that of 2005, following the same trend as in 2004 and 2005 (table 1). In 2004 and 2005, the commodity's value increased by \$530 million (more than 50%) and more than \$270 million (17%), respectively, when compared with the values for the previous year. In 2004, iron ore production shipments increased by 22% and in 2005 it decreased by 2% compared with the previous year's production shipments. Other mineral commodities with particularly large increases in value were crushed stone and industrial sand and gravel. A more than 18% increase in the production of crushed stone resulted in a more than 38%, or nearly \$34 million, rise in its value. In a similar manner, the production and value of industrial sand and gravel also increased. The largest decrease in value took place in that of construction sand and gravel. With a slight decrease in unit value, its production value decreased by \$13 million, or about 5% (table 1).

In 2006, Minnesota continued to rank first among other producing States in the quantity of iron ore produced and fifth in construction sand and gravel. The State rose in rank to second from third in the production of peat and to sixth from eighth in the production of industrial sand and gravel and it was the producer of significant quantities of crushed stone.

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 2006 USGS mineral production data published in this chapter are those available as of March 2008. All USGS Mineral Industry Surveys and USGS Minerals Yearbook chapters—mineral commodity, State, and country—can be retrieved over the Internet at URL <http://minerals.usgs.gov/minerals>.

The following narrative information was provided by the Minnesota Department of Natural Resources' (DNR) Division of Lands and Minerals² (MDLM). Production data in the following text are those reported by the MDLM, based upon its own surveys and estimates. The data may differ from some production figures reported by the USGS. In 2006, mining in Minnesota actively continued in the traditional nonfuel mineral sectors, and a variety of new mineral-related research and mineral exploration activities took place in the State. Identified resources of base metals, construction aggregates, dimension stone, direct-shipping grade iron ore, manganese, peat, and stone (landscaping) allowed for prospective opportunities for new mineral development in the State. Minnesota geologically has potential for the occurrence of such mineral resources as base metals and precious metals, diamond, and kaolin, as well as for oil and gas. The level of investment in mineral exploration activity was significantly higher than in the past few years and many additional mineral development investment opportunities continued to exist in the State.

Exploration and Development Activities

Metallic Mineral Exploration Activities

Exploration Drilling.—Four companies, Duluth Metals Ltd., Franconia Minerals Corp., Kennecott Exploration Co., and Polymet Mining Corp. explored for copper, nickel, and platinum-group metals (PGM) in Minnesota. Duluth Metals and Franconia Minerals were in the midst of drilling programs in the Duluth Complex, while Kennecott Exploration made plans for future drilling in east-central Minnesota, concentrating in the Tamarack area of Aitkin County. Polymet Mining Corp. was in the midst of an environmental review process for a proposed copper-nickel-PGM mine.

Exploration companies completed 119 drill holes under the State's Exploratory Boring law in the biennium (2-year period) ending January 25, 2007, which was about four times that of the previous biennium. There also was a significant increase in the number of State metallic mineral leases awarded since the previous biennium. The DNR performed drill-site inspections to ensure regulatory compliance with exploration laws and rules and compliance with leasing requirements for submission of drilling operation data, the inspections in part assessing the knowledge and compliance by ever-changing company personnel.

Kennecott Exploration, which drilled 19 holes in 2005, completed no drilling in 2006. However, the company did perform a gravity survey and downhole electromagnetic surveys in 2006 in the vicinity of Tamarack, Aitkin County, to identify new target areas to drill in the search for copper-nickel resources. Kennecott focused its efforts west of Cloquet, in the

²Maryanna Harstad, Senior Planner, authored the text of the State mineral industry information provided by the Minnesota Department of Natural Resources' Division of Lands and Minerals.

Tamarack area, where six holes had been drilled and cased to bedrock in preparation for bedrock core drilling. As many as 30 holes were approved in the current plan.

Duluth Metals Ltd. (a subsidiary of Wallbridge Mining Company Ltd.) drilled 11 core holes in Lake County beginning in April 2006. They were drilling out the Maturi Extension, a deep mineralized zone adjacent to the Maturi deposit, which was controlled by Franconia Minerals. Three rigs were drilling on holes 12, 13, and 14. Holes varied from 731 meters (m) (2,400 feet) to nearly 1,220 m (more than 4,000 feet) in depth. A total of nearly 10,400 m (34,031 feet) of core was drilled during the year; 30 holes were planned for this campaign on lands of State leases and Federal leases, and four mineral rights associated with private leases held pursuant to an agreement with RGGS Lands & Minerals Ltd. (Cox and others, 2009).

In June, Franconia Minerals began a \$10 million drilling program to obtain bulk samples at the Birch Lake copper-nickel-platinum-palladium deposit. The company drilled five holes (each with 4 wedges) and was working on the sixth hole in its bulk sample drilling phase, a large-diameter core of about 7.6 centimeters (cm) (3 + inches) that was being drilled to obtain a bulk sample for bench-scale metallurgical testing. The holes (excluding hole number 6) ranged from about 700 to 762 m in depth, thus far a total of 5,590 m, including wedges. Franconia planned to send the bulk samples to a Canadian metallurgical laboratory to begin the economic feasibility process.

Franconia also drilled two holes (968 m total for both) just east of LTV Steel Mining Company's former Dunka Mine in March to test mineralization near the contact of the Duluth Complex, but results did not merit further work at the time.

Other Exploration Projects.—608457 B.C. Ltd. performed two episodes of glacial till sampling for gold in the Mud Creek area, between Tower and Ely, in May and September. This sampling consisted of auger or shovel holes about 0.9 meters deep with the samples processed for contained gold grains. This leasing and exploration was a followup to DNR identification of gold-bearing till in that area.

Polymet Mining drilled 51 holes on its Northmet property near Babbitt during the fall of 2005. The NorthMet ore body contains cobalt, copper, gold, nickel, palladium, and platinum, as well traces of zinc and silver. Connected by a private railroad (about 10 kilometers to the west of the Northmet property) was Polymet Mining's Erie Plant, a large crushing and milling facility with extensive associated infrastructure. Polymet acquired the Erie Plant (then operated by Cleveland Cliffs, Inc) from LTV Steel (Polymet Mining Corp., 2008, p. 1–3). The company submitted an operating plan for as many as 103 drill holes on the Northmet property with drilling planned to begin the last week of January 2007. Polymet was also actively engaged in the environmental impact statement process for the project.

The NorthMet ore body is in the center of a trend of polymetallic nonferrous metal deposits on the northwestern contact of the Duluth Complex, an arc-shaped intrusive complex thought to have been emplaced along a system of northeast-trending faults associated with the Midcontinent rift system that underlies Lake Superior.

Encampment Resources L.L.C., which had planned to drill on Federal permits near Spruce Road in Lake County, did not drill because its permits there had been rescinded. The company planned to do some drilling on its other State leases in the winter.

Prime Meridian Resources Corp. had exploration agreements on non-State land minerals in Fillmore County over a buried mafic body that had been drilled some decades previous by New Jersey Zinc Co. The company also had State mineral leases in Koochiching County and Lake of the Woods County, but no activity took place in those areas by yearend.

Teck-Cominco American Corp. submitted an operational plan for drilling on the Babbitt copper-nickel deposit for 2007–2008, but approval of the plan remained pending at yearend.

During the spring, ArcelorMittal USA Inc. (Mittal Steel USA—Minorca Mine, Inc.) drilled 31 holes on its planned new taconite pit at Belgrade, just west of Biwabik.

Commodity Review

Industrial Minerals

The DNR Minerals Coordinating Committee (MCC) sponsored a one-day “Mineral Opportunity Meeting” addressing the topics of construction aggregates and dimension and landscape stone. Constructive dialogue took place between government and industry on associated current issues.

A controversy over the continued operation of a 6-year-old granite construction aggregate quarry in the Minnesota River Valley Scenic River District resulted in the Minnesota DNR Commissioner determining that the quarry was not in compliance with the Scenic River District Rules. The Renville County Board then did not renew the permit to mine for the quarry. The company has not yet complied with the county demands for reclamation for the quarry's closure.

The Minnesota DNR had three planned leases with Cliffs Natural Stone for properties at the former LTV Steel Corp. site. The pre-existing Stockpile lease for flagstone had an increase in royalty rate, with lease status still being processed. There was one new Earthen Material lease for nearly 49 hectares (ha) (120 acres), sent to the lessee for signature, and a second Earthen Material lease for a quarry site still being processed. At least three other companies inquired about access to the former LTV site to quarry dimension stone and take stockpiled stone, but access on a private road to the site, at least in part, was deterring those companies' ability to complete the leasing.

Public Arts St. Paul sponsored a stone sculpture event, in which stone carvers from around the world used large Minnesota quarry stone blocks to create new sculptures for public display. The event drew a large crowd and resulted in good publicity for Minnesota stone products in general. Minnesota DNR assisted by writing technical pieces for print media and doing video clips at the site, and also worked with all the Minnesota quarry stone companies to develop a stone sample display for the entry tent. This concept had been proposed at one of the MCC Mineral Opportunity Meetings.

In the 19th and 20th centuries, the Federal Government had conveyed several land grants of Federal land to Minnesota, as it did to other States (mostly western), to be held in trust for certain purposes. Through the Enabling Act of 1857, sections 16 and 36 were granted to the State for the use of schools—the School Trust Lands for the Permanent School Trust Fund (PSTF). Starting in 1901, Minnesota held mineral rights for the Federal lands then transferred to the State with the designated mineral rights under an act of the U.S. Congress. As of 2007, the State held slightly more than 1 million ha (2.5 million acres) of school trust lands and more than 400,000 ha (about 1 million acres) of severed trust minerals. Historically, minerals management generates the largest net income for the school trust fund with taconite and other iron ore being the leading producers. Other trust fund contributors include leases for peat, sand and gravel, and deposits of copper-nickel-platinum. The land remains available for other public uses, and for use by future generations. Annual income distribution provides for part of the school aid formula for K–12 education in the State. In fiscal year 2006, \$22 million was distributed. The ongoing project's goal is to increase revenues generated to the PSTF in accordance with directives in the Minnesota Constitution and Minnesota Statute 127A.31 (entitled, Goal of the Permanent School Fund) by identifying and selling (via lease) sand and gravel or crushed stone, called construction aggregates resources, from Permanent School lands. A cornerstone of this effort is the site-specific evaluations (to identify) of parameters including the areal extent, thickness, quality, volume, access to, and reclamation plan that affect the resource value and site management of construction sand and gravel deposits (Minnesota Department of Natural Resources, Division of Lands and Minerals, 2007, p. 5, 9, 10, 27).

Approximately 40 bedrock outcrop sites were reviewed for the potential to produce high-quality crushed stone aggregate from a PSTF site. In 2006, five sites were selected, sampled and analyzed by a laboratory-screening test. One site, near Finland, was rated as having the best overall potential, based on location and quality, but an October field visit revealed that the county had sold the adjacent tax forfeited property and a new residence was being built very near the common property line. Additionally, the access road to that property was across this PSTF property. This dropped the site from the high ranking and made more necessary work in the year to follow to find a different location to offer for lease.

Metals

Iron Ore.—In 2006, Minnesota's iron ore mining and pellet producing operations for the most part were under the ownership of three main companies, ArcelorMittal, Cleveland-Cliffs Inc, and United States Steel Corp. The three companies employed a total of 3,576 employees. With a total rated capacity of about 41 Mt (40.4 million gross tons) of taconite pellet production, the actual production was approaching 100% at 40.8 Mt in 2006, with increased production expected in 2007 by all companies.

United Taconite, LLC a new taconite company formed in December 2003 [Cleveland-Cliffs Inc (70%) and the Chinese steel company, Laiwu Steel Corp. (30%)] purchased the assets of the former EVTAC Mining Co. United Taconite's mine was

located west of and adjacent to Eveleth, MN. Crude ore was mined, crushed, and rail-hauled about 15 kilometers (km) (9 miles) south to its processing plant near Forbes. The processing plant including its 2004 restarted line #1 (previously idled since 1999) was rated at nearly 5.3 million metric tons (Mt) (5.2 million gross tons) of pellets. United Taconite had one State taconite mining lease comprised of nearly 49 ha (120 acres).

Hibbing Taconite Co. (HTC) [ArcelorMittal (62%), Cliffs Mining Co. (23%), and Stelco Inc. (15%)] had mining (four separate pits) and plant operations located about 5 km north of Hibbing. HTC, which employs autogenous grinding in its primary mill circuits, was the first North American pellet producer to install tower mills/verti-mills for fine grinding and improved liberation. The HTC plant was rated at 8.3 Mt of pellets. HTC had 10 State mining leases comprising about 208 ha.

At the Minorca Mine (a wholly owned subsidiary of ArcelorMittal) mining took place at the Laurentian Pit located about 1.5 km northeast of Gilbert; the company moved crude ore via haul trucks about 10 km to the Minorca plant about 3 km northeast of Virginia, MN, for processing. The plant was rated at more than 2.6 Mt of pellets. Minorca had no State mining leases.

U.S. Steel—Keewatin Taconite (formerly National Steel Pellet Co.) has operated its Keewatin facility under the company's Minnesota Ore Operations since May 2003. Keewatin Taconite's mine and plant facilities, located about 1.5 km north of Keewatin, was the only active taconite mining operation in Itasca County. The plant was rated at 5.6 Mt of pellets and the company held 5 State mining leases totaling 178 ha.

Northshore Mining Company, owned by Cliffs Minnesota Minerals Co. (a wholly owned subsidiary of Cleveland-Cliffs Inc), operated a mine 8 km southeast of Babbitt. The company's plant in Silver Bay was rated at 4.9 Mt of taconite pellets. Northshore held three State taconite leases totaling 162 ha.

U.S. Steel—Minnesota Ore Operations' Minntac Mine and plant facilities, located about 1.5 km north of Mountain Iron, was the largest taconite mine and plant in North America, its pit extending 16 km in length and its plant was rated at a capacity of about 15.6 Mt of pellets. U.S. Steel held 38 State taconite leases totaling nearly 1,100 ha.

Government Programs

Minnesota Minerals Research Programs

The Iron Ore Cooperative Research Program, previously created by the Minnesota Legislature, was used to assist the Minnesota taconite industry by providing funds for taconite research projects. The program was appropriated \$550,000 for fiscal years 2006–2007 to be matched by \$275,000 of taconite company money. A committee consisting of Minnesota taconite-company metallurgists, research scientists, and Minnesota DNR engineers determined the research priorities. The funded research projects were usually performed in Minnesota research laboratories and pilot-plant facilities. The program was considered very successful with many of the funded research projects being instituted at the taconite facilities resulting in improved product quality and reduced production costs.

The State's Mineral Coordinating Committee was established by the Minnesota Legislature as part of the minerals diversification plan. The committee was apportioned \$344,000 for fiscal years 2006–2007 for funding mineral research projects. The goal is to fund research projects that increase knowledge of the State's mineral potential, stimulate the development of mineral resources in the State, and promote basic mineral research. The programs success resulted in increased interest in exploration and development of Minnesota's copper-nickel resources by mining companies such as Franconia Minerals Corp., Polymet Mining Co., and Teck-Cominco Ltd. Funding from this program was also used to identify Minnesota aggregate resources, which aided county planning agencies in determining zoning regulations.

The Minnesota Legislature created the Permanent University Trust Fund to be used for Minnesota taconite and mineral research. The fund was formed using mining royalties paid by companies that mine on University Trust Land. In 2006, the total amount in the fund was about \$30 million, which is allowed to increase to as high as \$50 million. Each year the interest from the fund is used to provide grants to perform taconite and minerals research at the University of Minnesota's Coleraine Minerals Research Laboratory. Disbursements from the fund for research during FY 2006 were about \$1.2 million. Several successful projects developed at the Coleraine Laboratory have been installed at Minnesota taconite facilities.

The DNR's Mineral Management Initiative Fund (the 420 Fund) was established to help maintain and increase income from the mining of State-owned mineral deposits. Projects have involved: 1) examination of selected bedrock drill core for clues to deposits of diamonds, gold, platinum, or other metals; 2) compilation of mineral data including dimension stone, ilmenite, landscape stone, and iron ore for a number of Minnesota sites; 3) performing mineral ownership title work that focuses on priority areas on the Mesabi Range and other areas of the State that have nonferrous metallic mineral potential; 4) coordinating and conducting research to help the taconite companies

find ways to reduce mercury emissions; and 5) assisting in conducting baseline research and environmental review for new mineral projects.

Environmental and Technological Research.—The Minnesota Legislature established a Cooperative Research Fund to address environmental issues resulting from mining. The fund is administered by the DNR and was appropriated \$173,000 for fiscal years 2006–2007. Research or demonstration projects are done in each of the State's mining sectors (ferrous, industrial mineral, and nonferrous), and projects require a 50% match by non-State monies. The overall goal of the programs is to develop and demonstrate new and cost-efficient reclamation techniques applicable to the State's mining industry. Results and techniques developed from this program have been implemented by the mining industry to address reclamation procedures, mine development and closure, and the control of environmental impacts.

In addition to DNR's Web site entitled, Public Access to Minerals Data, at URL <http://minarchive.dnr.state.mn.us>, aggregate resource maps, monthly data releases, and many online documents pertaining to mineral and mining research and exploration in Minnesota are available on the State agency's home page at www.dnr.state.mn.us.

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

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral	2004		2005		2006	
	Quantity	Value	Quantity	Value	Quantity	Value
Clays, common	20	22	20	22	32	40
Gemstones, natural	NA	6	NA	6	NA	6
Iron ore, usable shipped	41,400	1,560,000	40,600	1,830,000	40,400	2,160,000
Lime	W	(3)	W	(3)	W	(3)
Peat	63	5,210	68	5,670	69	5,280
Sand and gravel:						
Construction	54,900	235,000	54,100	253,000	50,300	240,000
Industrial	W	(3)	W	(3)	W	(3)
Stone:						
Crushed	10,400 ⁴	64,900 ⁴	10,500	87,400 ^r	12,400	121,000
Dimension	22	12,400	19	13,400	22	12,400
Total	XX	1,880,000	XX	2,190,000	XX	2,540,000

^rRevised. NA Not available. W Withheld to avoid disclosing company proprietary data. XX Not applicable.

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.

⁴Excludes certain stones; value excluded to avoid disclosing company proprietary data.

TABLE 2
MINNESOTA: CRUSHED STONE SOLD OR USED, BY KIND¹

Kind	2005			2006		
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Number of quarries	Quantity (thousand metric tons)	Value (thousands)
Limestone	38 ^r	3,540 ^r	\$28,600 ^r	39	4,860	\$46,800
Granite	4	2,690	23,000 ^r	5	3,180	30,700
Dolomite	7 ^r	3,900 ^r	32,400 ^r	6	4,000	40,000
Quartzite	1	315 ^r	3,200 ^r	1	310	3,150
Miscellaneous stone	1	22	207	1	52	529
Total	XX	10,500	87,400 ^r	XX	12,400	121,000

^rRevised. XX Not applicable.

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

TABLE 3
MINNESOTA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2006, BY USE¹

(Thousand metric tons and thousand dollars)

Use	Quantity	Value
Construction:		
Coarse aggregate (+1½ inch):		
Macadam	W	W
Riprap and jetty stone	131	2,630
Filter stone	W	W
Other coarse aggregate	47	894
Total	208	3,810
Coarse aggregate, graded:		
Concrete aggregate, coarse	631	5,770
Bituminous aggregate, coarse	193	2,840
Bituminous surface-treatment aggregate	(2)	(2)
Railroad ballast	623	5,150
Other graded coarse aggregate	221	2,850
Total	1,670	16,600
Fine aggregate (¾ inch):		
Stone sand, concrete	W	W
Stone sand, bituminous mix or seal	310	2,640
Screening, undesignated	W	W
Other fine aggregate	87	1,500
Total	453	4,590
Coarse and fine aggregates:		
Graded road base or subbase	1,280	13,000
Unpaved road surfacing	(3)	(3)
Crusher run or fill or waste	64	607
Other coarse and fine aggregates	70	266
Total	1,410	13,900
Other construction materials	8	108
Agricultural:		
Limestone	(4)	(4)
Poultry grit and mineral food	(5)	(5)
Other miscellaneous uses and specified uses not listed	(5)	(5)
Unspecified:⁶		
Reported	3,100	26,300
Estimated	5,500	56,000
Total	8,650	81,900
Grand total	12,400	121,000

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

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

²Withheld to avoid disclosing company proprietary data; included with "Other graded coarse aggregate."

³Withheld to avoid disclosing company proprietary data; included with "Other coarse and fine aggregates."

⁴Withheld to avoid disclosing company proprietary data; included with "Unspecified: Reported."

⁵Withheld to avoid disclosing company proprietary data; included in "Grand total."

⁶Reported and estimated production without a breakdown by end use.

TABLE 4
MINNESOTA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2006, BY USE AND DISTRICT^{1,2}

(Thousand metric tons and thousand dollars)

Use	District 2		Districts 3 and 4 ³		Districts 5 and 6 ³		Unspecified districts	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction:								
Coarse aggregate (+1½ inch) ⁴	--	--	93	1,600	115	2,210	--	--
Coarse aggregate, graded ⁵	--	--	1,510	14,000	158	2,560	--	--
Fine aggregate (¾ inch) ⁶	--	--	350	2,980	103	1,610	--	--
Coarse and fine aggregates ⁷	--	--	354	3,040	1,060	10,800	--	--
Other construction materials	--	--	8	108	--	--	--	--
Agricultural ⁸	--	--	W	W	(9)	(9)	--	--
Other miscellaneous uses and specified uses not listed	--	--	W	W	--	--	--	--
Unspecified: ¹⁰								
Reported	--	--	1,790	17,800	618	5,960	696	2,500
Estimated	3	25	390	4,000	5,200	52,000	--	--
Total	3	25	4,500	43,800	7,200	74,800	696	2,500

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

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

²No production for District 1.

³Districts 3 and 4 and 5 and 6 are combined to avoid disclosing company proprietary data.

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

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

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

⁷Includes crusher run or fill or waste, graded road base or subbase, unpaved road surfacing, and other coarse and fine aggregates.

⁸Includes agricultural limestone and poultry grit and mineral food.

⁹Withheld to avoid disclosing company proprietary data; included with "Unspecified: Reported."

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

TABLE 5
MINNESOTA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2006,
BY MAJOR USE CATEGORY¹

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	5,440	\$30,400	\$5.58
Plaster and gunite sands	72	596	8.28
Concrete products (blocks, bricks, pipe, decorative, etc.)	176	2,020	11.47
Asphaltic concrete aggregates and other bituminous mixtures	5,580	32,700	5.85
Road base and coverings ²	13,800	44,700	3.23
Fill	2,870	8,300	2.89
Snow and ice control	129	472	3.66
Railroad ballast	29	243	8.38
Roofing granules	14	124	8.86
Other miscellaneous uses ³	126	1,260	10.00
Unspecified: ⁴			
Reported	3,090	14,200	4.58
Estimated	18,900	105,000	5.55
Total or average	50,300	240,000	4.77

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

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

³Includes filtration.

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

