THE MINERAL INDUSTRY OF MONTANA

This chapter has been prepared under a Memorandum of Understanding between the U.S. Geological Survey and the Montana Bureau of Mines and Geology for collecting information on all nonfuel minerals.

In 1998, the preliminary estimated value[1] of nonfuel mineral production for Montana was $500 million, according to the U.S. Geological Survey (USGS). This was a $2 million increase from that of 1997, [2] following an identical increase in 1997 from that of 1996. The State ranked 29th (27th in 1997) in the Nation in nonfuel mineral production value, of which Montana accounted for more than 1% of the U.S. total.

Overall, metallic minerals accounted for more than 73% of the State's total nonfuel mineral value. By value, copper was Montana's leading nonfuel mineral, followed by gold. Palladium was the State's third-leading nonfuel mineral commodity.

In 1998, large increases in the values of palladium, platinum, and molybdenum (table 1), plus smaller increases in portland cement, construction sand and gravel, and crushed stone, more than compensated for decreases in gold, zinc, copper, bentonite, and talc. This resulted in a small net gain in nonfuel mineral production value for the year. (All listings are in descending order of the magnitude of change.) Other values that increased in 1998 were those of silver, iron ore, masonry cement, lime, dimension stone, and common clay. Other values that decreased included those of industrial sand and gravel, gemstones, industrial garnet, and peat. All other mineral commodity values virtually remained the same. In 1997, a similar gain in value resulted from significant increases in palladium, platinum, and zinc, plus smaller increases in bentonite, crushed stone, and lead. These more than balanced out decreases in copper, gold, and construction sand and gravel, and smaller though significant decreases in molybdenum, silver, talc, and lime. All other changes were small and inconsequential to the net result.

Based on USGS estimates of the quantities produced in the 50 States in 1998, Montana continued as the only[2] U.S. producer of primary palladium and platinum. The State remained first in the production of talc; third of three industrial garnet-producing States; fourth in lead; fifth in copper, molybdenum and zinc; and sixth in gold and silver. Montana dropped in rank to 3d from 2d in bentonite and to 10th from 5th in gemstones.

The Montana Bureau of Mines and Geology (MBMG) provided the narrative information that follows.[3] During 1998, the State's minerals industry experienced low and generally declining prices for most commodities, and a continued slowness in the mine permitting process.

Metals

Sixteen years after the first public meeting and 12 years after submission of its permit application (October 1987), ASARCO Incorporated's Rock Creek copper-gold project, northwest of Missoula, neared the completion of its permitting process. The approval of the final Environmental Impact Statement (EIS) was anticipated for summer 1999, with operating permits soon to follow. Canyon Resources Corp.'s McDonald Gold project (north of Helena) was in a very uncertain situation with $70 million invested thus far. The project's EIS was incomplete and significantly overdue, and the project was over budget by about three times its anticipated cost. As a result of passage of a public initiative banning future developments of cyanide leaching projects, Initiative 137 (I-137), Canyon Resources was not able to use the only economically viable processing alternative that the company felt it had. Canyon Resources indicated it may file what is called a "taking" lawsuit to recapture its forfeited investment and projected profits.

Early in 1999, Pegasus Gold Inc.'s Diamond Hill gold mine, southeast of Helena, closed temporarily, having been affected by the parent corporation's 1998 bankruptcy proceedings. According to the MBMG, although the bankruptcy proceedings appeared near completion, mining companies communicated to them that those proceedings have further complicated obtaining bond financing by raising the cost. The bonds became more difficult to obtain because of the possibility that the bonding companies could be held responsible for payment of the final reclamation in lieu of the precedent of the Pegasus Gold forfeiture. In 1998, the mine had been developed to the 300-meter level and was then producing over 900 metric tons per day.

Following a long EIS process, Placer Dome Inc.'s Golden Sunlight gold-silver mine, near Butte, was awarded permits to expand its waste rock dumps. The Montana Environmental Information Council challenged the decision in court. Loss of the court case would force closure of the mine because a law

[1]The terms "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 1998 USGS mineral production data published in this chapter are preliminary estimates as of February 1999 and are expected to change. For some mineral commodities (for example, 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. A telephone listing for the specialists may be retrieved over the Internet at http://minerals.usgs.gov/minerals/contacts/comdir.html; by using MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset (request Document #1000 for a telephone listing of all mineral commodity specialists); or by calling USGS information at (703) 648-4000 for the specialist's name and number. All Mineral Industry Surveys—mineral commodity, State, and country—also may be retrieved over the Internet at http://minerals.usgs.gov/minerals; facsimile copies may be obtained from MINES FaxBack.

[2]Values, percentage calculations, and rankings for 1997 may vary from the *Minerals Yearbook, Area Reports: Domestic 1997, Volume II*, owing to the revision of preliminary 1997 to final 1997 data. Data for 1998 are preliminary and expected to change, while related rankings may also be subject to change.

[3]Robin B. McCulloch, Staff Mining Engineer, authored the text of mineral industry information submitted by the Montana Bureau of Mines and Geology.

established as part of the passage of I-137 does not allow the company to reapply for the dump expansion.

Pegasus Gold Inc. canceled an expansion of its Zortman gold-silver project, near Malta, and commenced final reclamation for the project's closure. As of early 1999, TVX Gold Inc. was unable to find a buyer for its Mineral Hill gold-silver mine, near Gardiner. If not sold, the company is likely to progress with plans to reclaim the property in 1999.

Stillwater Mining Co.'s platinum, palladium, gold, copper (not yet recovered), nickel, and rhodium operations were the bright spot in Montana's metal mining industry. The company's operations are located at three sites between Billings and Big Timber—two mines, the Stillwater Mine and the East Boulder Mine project and a smelter in Columbus. Whereas Stillwater endured low capitalization and prices when other commodities and companies in past years have been somewhat more fortunate, relatively recent shortages in international commodity markets for platinum-group metals have provided an excellent development environment for Stillwater.

Stillwater secured adequate futures contracts in order to fund an ambitious expansion program. At the smelter site in Columbus, work was initiated on a new copper and nickel recovery plant and a new 90 ton-per-day smelting furnace. The Stillwater mill was undergoing modifications to increase throughput to almost 3,000 tons per day, up from about 1,800 tons per day. Mill construction was essentially complete. At the Stillwater Mine, development was underway to provide the necessary stopes and access for the projected mining rate. A record of decision was issued for a new pond and slurry line project to diminish the company's environmental risk. Two tunnel-boring machines are being used in twin 5,600-meter drives to the J-M Reef formation, near Big Timber. Completion is expected before 2000, and production will commence at the East Boulder Mine shortly thereafter. As reported to the MBMG, Stillwater Mining projected that an annual production level of nearly 16,000 kilograms (500,000 troy ounces) of palladium and platinum was attainable for the company within 5 years, and that finding enough skilled labor to meet production quotas was its most likely obstacle.

Industrial Minerals

In the industrial minerals sector, the cement industry continued to produce at capacity, but the talc industry experienced a significant loss in its share of the market during the time of the Asian economic crises. Luzenac America spent the last year reclaiming its chlorite mine, southeast of Butte.

Cominco American Resources, Inc. put its industrial minerals division mining properties up for sale, in particular its two garnet operations in Alder and Dillon. The Alder operation (Ruby Garnet) negotiated with a number of companies; Sweetwater Garnet ceased operations in August and began welcoming inquiries for buyers.

Exploration

Exploration activity levels continued to decline with few companies having sufficient funds available for investment owing to low commodity prices. As related to the MBMG, available funds were often redirected from Montana because the companies reported difficulty in securing financing on Montana projects. According to the MBMG, no industrial minerals exploration was being conducted at yearend 1998 on into the early part of 1999. In 1988, 56 companies spent $23.6 million on 75 exploration projects. In 1998, 19 companies, including only three major companies, spent less than $450,000 on 21 exploration projects.

On the western side of the Elkhorns, east of Boulder, Treminco Resources Ltd. completed an eight-hole, due-diligence drilling program on the Elkhorn gold project. Holding interests in the property were Newmont Gold Co., Goldfields Mining Co., and Santa Fe Pacific Gold Co. Treminco took an option on the property and entered a letter of intent in April 1998 to acquire the property from Hospah/Santa Fe Gold Co. The company is planning to develop the East Butte portion of the package as an underground mine and estimates 540 tons per day will be mined using a mechanized open stope process with some backfilling. Treminco plans to haul the ore to the Placer Dome's Golden Sunlight facility for processing. Costs were estimated to be between $105 and $211 per troy ounce of gold for the first 3 years, and Treminco anticipated that production would begin in summer 1999.

Hanover Gold Company Inc. maintained an extensive drilling program in the Virginia City area as evaluation of its Alder Gulch/Brown's Gulch property package continued through the first half of 1998. The results, although not definitive, were encouraging in delineation of economic mineralization. By August, as the anti-cyanide I-137 campaign appeared to be gaining support, Hanover suspended exploration, awaiting results of the election. Although the prospect was not specifically designated as heap leach, the company indicated a waning enthusiasm to proceed under current legal and economic restraints. After I-137 passed in November, Hanover Gold dropped plans for much of its Alder Gulch property package and soon after closed its Montana offices.

Legislation and Government Programs

In 1998, Montana's metal mining industry experienced possibly its most difficult year of the current decade. Low commodity prices coupled with continuing challenges in the courts and in the legislative arena from the environmental community have produced a steady retreat by mining companies from the State. In the spring of 1998, work on I-137 began as an effort to institute a ban all new surface mines, or expansions of surface mines, that use cyanide in a leach circuit. The mining industry's case was hampered by two factors: 1) initiative 125, passed in a previous legislative session, forbid the use of corporate dollars or employee's time in addressing initiative campaigns; and 2) fines were levied against businesses that failed to file with the Commissioner of Political Practices as Political Action Committees , after they contributed money and committed employee's time to fight ballot issues during the 1996 election. The Commissioner, under State administrative law 44.10.321, determined that any two individuals discussing a ballot issue constitutes a political action committee, and must report their activities or be fined.

Fines incurred during the 1996 campaign were not settled until December 1998.

The combination of bans and fines significantly limited the mining industry response during the I-137 campaign. Initiative 125 was declared unconstitutional 12½ days before the election, giving the mining industry limited time to prepare and fully communicate to the voters its side of the issues that I-137's proponents had been presenting to the public for months. Although I-137 was significantly defeated in some counties, the initiative was approved in November by 52% of the votes Statewide. Initiative 137 was challenged immediately in the courts, while bills to nullify the initiative were drafted for the upcoming legislature.

During August, many gold mining companies that were active in the State put all planned expenditures and investments scheduled for activities in Montana on hold until after the election. As a result of passage of I-137, nearly all exploration and/or development work being conducted on pre-production properties has remained curtailed.

In contrast, bills favorable to the mineral industry and business in general appeared to be headed for legislative approval. An exploration incentive bill, modeled after Alaska legislation, easily passed through the State Senate and was under study in that government body's Taxation Committee. Bills designed to reduce property taxes also received a favorable response. While bills addressing changes to I-137 have been the subjects of vigorous debate, these issues remained unresolved.

Outlook

During the last 10 years, no new major mines have been permitted in Montana. As related to the MBMG, metal-mining companies seem to perceive that permits for large mines are likely to be unachievable. Conversely, permits for small to medium-sized operations do not appear to be a problem, especially if they are for underground mine operations.

As expressed by the MBMG, the future of metals exploration and development in Montana depends on several items: commodity prices, final disposition of the cyanide ban, the mining industry's and the business community's perception of Montana's business environment, and the perceived ability to permit a major mine in the State.

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN MONTANA 1/ 2/

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral		1996 Quantity	1996 Value	1997 Quantity	1997 Value	1998 p/ Quantity	1998 p/ Value
Clays:		34	W	W	W	W	W
Gemstones		NA	1,840	NA	1,120	NA	504
Gold 3/	kilograms	9,440	118,000	10,200	109,000	8,700	82,800
Lead 3/	metric tons	7,970	8,580	9,230	9,470	9,000	8,930
Palladium	kilograms	6,100	25,500	8,400	49,700	11,100	67,800
Platinum	do.	1,840	23,500	2,610	33,200	3,460	45,200
Sand and gravel: Construction		9,260	35,800	8,390	30,800	8,760	33,100
Stone:		2,000	8,580	2,600	10,600	2,700	12,100
Zinc 3/	metric tons	19,400	21,900	21,500	30,600	21,000	24,200
Combined values of cement, clays [bentonite, fire (1996)], copper, garnet (industrial), iron ore (1996, 1998)], lime, molybdenum, peat, sand gravel [industrial, (1996-97)], silver, stone miscellaneous), talc and pyrophyllite, and values indicated by symbol W		XX	252,000	XX	223,000	XX	226,000
Total		XX	496,000	XX	498,000	XX	500,000

p/ Preliminary. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined values" data.
XX Not applicable.
1/ Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
2/ Data are rounded to three significant digits; may not add to totals shown.
3/ Recoverable content of ores, etc.

TABLE 2
MONTANA: CRUSHED STONE SOLD OR USED, BY KIND 1/

Kind	1996 Number of quarries	1996 Quantity (thousand metric tons)	1996 Value (thousands)	1996 Unit value	1997 Number of quarries	1997 Quantity (thousand metric tons)	1997 Value (thousands)	1997 Unit value
Limestone	13	1,540	$6,240	$4.06	23	2,020	$8,620	$4.27
Traprock	3	W	W	W	3	W	W	W
Sandstone and quartzite	3	W	W	W	5	W	W	W
Volcanic cinder and scoria	1	3	9	3.00	1	6	18	3.00
Miscellaneous stone	--	--	--	--	1	104	119	1.14
Total	XX	2,000	8,580	4.29	XX	2,600	10,600	4.09

W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.
1/ Data are rounded to three significant digits; may not add to totals shown.

TABLE 3
MONTANA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1997,
BY USE 1/ 2/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch): Riprap and jetty stone	13	$39	$3.00
Coarse aggregate, graded: Railroad ballast	W	W	5.51
Coarse and fine aggregates:			
Graded road base or subbase	72	160	2.22
Unpaved road surfacing	95	294	3.09
Other coarse and fine aggregates	W	W	2.00
Other construction materials	271	1,270	4.70
Chemical and metallurgical:			
Cement manufacture	(3/)	(3/)	4.00
Lime manufacture	(3/)	(3/)	7.00
Flux stone	(3/)	(3/)	2.04
Other miscellaneous uses: Acid neutralization	(3/)	(3/)	3.81
Unspecified: 4/			
Actual	104	119	1.14
Estimated	809	2,990	3.70
Total	2,600	10,600	4.09

W Withheld to avoid disclosing company proprietary data; included in "Other construction materials."
1/ Data are rounded to three significant digits; may not add to totals shown.
2/ Includes limestone, quartzite, sandstone, traprock and volcanic cinder and scoria.
3/ Withheld to avoid disclosing company proprietary data; included in "Total."
4/ Includes reported and estimated production without a breakdown by end use.

TABLE 4
MONTANA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1997,
BY USE AND DISTRICT 1/

(Thousand metric tons and thousand dollars)

	District 1		District 2		Unspecified districts	
Use	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:						
Coarse aggregate (+1 1/2 inch) 2/	W	W	--	--	--	--
Coarse aggregate, graded 3/	W	W	--	--	--	--
Coarse and fine aggregate 4/	W	W	79	178	--	--
Other construction materials	372	1,590	--	--	--	--
Chemical and metallurgical 5/	1,190	5,590	--	--	--	--
Other miscellaneous uses 6/	(7/)	(7/)	--	--	--	--
Unspecified: 8/						
Actual	--	--	--	--	104	119
Estimated	(7/)	(7/)	649	2,570	--	--
Total	1,770	7,770	728	2,750	104	119

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
1/ Data are rounded to three significant digits; may not add to totals shown.
2/ Includes riprap and jetty stone.
3/ Includes railroad ballast.
4/ Includes graded road base or subbase, unpaved road surfacing, and other coarse and fine aggregates.
5/ Includes cement manufacture, flux stone, and lime manufacture.
6/ Includes acid neutralization.
7/ Withheld to avoid disclosing company proprietary data; included in "Total."
8/ Includes reported and estimated production without a breakdown by end use.

TABLE 5
MONTANA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1997,
BY MAJOR USE CATEGORY 1/

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	1,150	$5,390	$4.70
Plaster and gunite sands	2	6	3.00
Concrete products (blocks, bricks, pipe, decorative, etc.)	71	165	2.32
Asphaltic concrete aggregates and other bituminous mixtures	969	4,930	5.09
Road base and coverings 2/	3,130	9,750	3.11
Fill	507	1,650	3.25
Snow and ice control	254	914	3.60
Railroad ballast	20	99	4.95
Other miscellaneous uses 3/	123	465	3.78
Unspecified: 4/			
Actual	218	712	3.27
Estimated	1,950	6,720	3.45
Total or average	8,390	30,800	3.67

1/ Data are rounded to three significant digits; may not add to totals shown.
2/ Includes road and other stabilization (cement).
3/ Includes filtration.
4/ Includes reported and estimated production without a breakdown by end use.

TABLE 6
MONTANA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1997,
BY USE AND DISTRICT 1/

(Thousand metric tons and thousand dollars)

	District 1		District 2	
Use	Quantity	Value	Quantity	Value
Concrete aggregates (including concrete sand) 2/	973	4,090	246	1,480
Asphaltic concrete aggregates and road base materials 3/	2,640	10,000	1,460	4,680
Fill	396	1,180	111	472
Other miscellaneous uses 4/	376	1,340	22	137
Unspecified: 5/				
Actual	217	712	--	--
Estimated	1,320	4,510	626	2,210
Total	5,930	21,800	2,460	8,980

1/ Data are rounded to three significant digits; may not add to totals shown.
2/ Includes plaster and gunite sands.
3/ Includes road and other stabilization (cement).
4/ Includes filtration, railroad ballast, and snow and ice control.
5/ Includes reported and estimated production without a breakdown by end use.