

THE MINERAL INDUSTRY OF COLORADO

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

Colorado ranked 28th among the 50 States in total nonfuel mineral production value¹ in 1995, according to the U.S. Geological Survey (USGS). The State was 29th in 1994 (based on final data). The estimated value for 1995 was \$448 million, a nearly 10% increase from that of 1994. This followed a 2.7% increase from 1993 to 1994. The State accounted for more than 1% of the U.S. total nonfuel mineral production value.

Almost three-fifths of Colorado's nonfuel mineral production value came from industrial minerals, especially construction sand and gravel, portland cement, and crushed stone. Most of the remaining value resulted from molybdenum, gold, and zinc, in descending order of value. An increase in molybdenum value of almost 80% accounted for much of the State's rise in value in 1995. Other nonfuel mineral values that increased in 1995 were zinc, lead, silver, Grade-A helium, and gemstones. The remaining mineral commodities (see table 1) decreased in value. In 1994, most of Colorado's mineral commodities increased in value, led by the gains in molybdenum and gold. Only construction sand and gravel and crushed and dimension stones decreased.

Compared with USGS estimates of the quantities produced in 1995 in the other 49 States, Colorado

remained second in molybdenum, fifth in lead, sixth in zinc, and eighth in gold. Substantial quantities of construction sand and gravel, crushed stone, and portland cement were also produced in the State.

The Colorado Geological Survey² (CGS) reported that Pikes Peak Mining Co. opened the Cresson Mine in the Cripple Creek District of Teller County in February 1995. The new open pit mine reportedly has total proven and probable gold reserves of more than 66 million metric tons³ (73 million short tons) at a grade of 1.03-grams-per-ton (0.03-troy-ounce-per-short-ton). Mine management had forecasted approximately 3,100 kilograms (100,000 troy ounces) of production for 1995 and about 5,100 kilograms (165,000 troy ounces) during 1996 and succeeding years. Pikes Peak also reported that it had depleted minable gold and silver reserves at its Globe Hill and Ironclad Mines. Both mines are closed and undergoing reclamation. Battle Mountain Gold Co., operator of the San Luis Gold Mine in Costilla County, reduced cash operating costs from \$250 per troy ounce in the first quarter of 1995 to \$210 in the second quarter. The company planned to produce about 2,100 kilograms (68,000 troy ounces) of gold per year in both 1995 and 1996.

During 1994, improving economies in the Far East and

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

Mineral	1993		1994		1995 ^a	
	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Clays thousand metric tons	281	\$2,160	291	\$2,320	288	\$2,020
Gemstones	NA	258	NA	267	NA	300
Gold ^b kilograms	W	W	⁴ 4,420	⁴ 54,700	⁴ 4,340	⁴ 52,000
Sand and gravel (construction) thousand metric tons	^c 29,000	^c 118,000	29,000	109,000	27,500	106,000
Stone:						
Crushed do.	10,300	62,000	8,600	53,600	8,200	51,300
Dimension metric tons	4,320	1,370	⁵ 3,630	⁵ 51	W	W
Combined value of cement, copper (1993), gypsum (crude), helium (Grade-A), lead, lime, molybdenum, peat, perlite (1993), sand and gravel (industrial), silver, stone [dimension marble (1994)], zinc, and value value indicated by symbol W	XX	216,000	XX	¹ 191,000	XX	237,000
Total	XX	399,000	XX	⁴ 410,000	XX	448,000

^aEstimated. ^bPreliminary. ^cRevised. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

¹Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

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

³Recoverable content of ores, etc.

⁴Placer canvassing discontinued beginning 1994. May include placer data from other sources.

⁵Excludes certain stones; kind and value included with "Combined value" data.

Europe resulted in an increase in the demand for molybdenum, leading to higher prices in early 1995. In January 1995, the free market price for molybdic acid rose from \$35 to almost \$40 per kilogram (\$16 to \$18 per pound), gradually declining to \$9.40 to \$10.35 per kilogram (\$4.25 to \$4.70 per pound) by late September. As a result of the January molybdenum price increase, Cyprus Amax Minerals Co. increased production at the Henderson Mine, Clear Creek County, and reopened the Climax Mine in Lake County from April to August. Production for 1995 from both mines was estimated at more than 18,000 tons (40 million pounds). Providing that the global economy continues to improve, company officials predicted that 1996 production would stabilize at slightly below that level. Base metal production, excluding molybdenum, was relatively insignificant in the State. However, ASARCO Incorporated announced it would continue production of more than 800 tons per day (900 short tons per day) of copper-lead-zinc-silver-gold ore from its Black Cloud Mine at Leadville, Lake County.

Diamond Company N.L. of Fort Collins completed a 160 metric-ton-per-hour diamond processing plant at its Kelsey Lake property in the State Line District of Larimer County in December 1995. More than 60% of the diamonds recovered during a bulk sampling program in 1994 were of gem quality, including a 14.2 carat white diamond, the largest ever discovered in the district and the eighth largest found in North America. Mining of two kimberlite bodies during 1995 was expected to provide a stockpile for the proposed plant startup in the first half of

1996. The company reported initial diamond-bearing kimberlite reserves of 16.9 million tons down to 100 meters depth.

The construction sand and gravel and aggregate industries reportedly were doing well in the Front Range area from Colorado Springs to Fort Collins and in selected areas of western Colorado. CGS expected production of aggregate in 1995 to be about 41 million tons (45 million short tons), down slightly from 1994 levels.

High-quality, low-sulfur coal from Colorado was in moderately high demand. Production in 1995 was estimated at almost 23 million tons (25 million short tons). In 1995, while several of the State's coal mines were idled or shut down, other mines such as Cyprus Amax's Twentymile Mine were setting new production records. The coal mines surviving in Colorado were efficient, low-cost producers.

¹The 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 1995 USGS mineral production data are estimates, as of Dec. 1995. For some commodities, especially 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. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

²The remaining narrative portion of this report was based on information provided by the Colorado Geological Survey.

³All tons are metric tons unless otherwise specified.

TABLE 2
COLORADO: CRUSHED STONE¹ SOLD OR USED BY PRODUCERS IN 1994, BY USE²

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch)			
Riprap and jetty stone	364	\$2,350	\$6.46
Filter stone	W	W	4.24
Other coarse aggregate	7	32	16.50
Coarse aggregate, graded:			
Concrete aggregate, coarse	W	W	6.67
Bituminous aggregate, coarse	671	4,470	6.65
Railroad ballast	13	62	4.77
Fine aggregate (-3/8 inch):			
Stone sand, bituminous mix or seal	W	W	3.40
Screening, undesignated	77	1,270	16.50
Coarse and fine aggregates:			
Graded road base or subbase	564	2,680	4.75
Terrazzo and exposed aggregate	W	W	14.40
Crusher run or fill or waste	476	1,410	2.96
Other coarse and fine aggregates	1,340	7,340	5.49
Poultry grit and mineral food	⁽³⁾	⁽³⁾	6.61
Chemical and metallurgical:			
Cement manufacture	1,320	6,770	5.12
Special:			
Mine dusting or acid water treatment	⁽³⁾	⁽³⁾	6.61
Asphalt fillers or extenders	⁽³⁾	⁽³⁾	6.61
Unspecified:⁴			
Actual	3,110	23,100	7.42
Estimated	531	3,320	6.26
Total	8,600	53,600	6.23

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

¹Includes granite, limestone, miscellaneous stone, sandstone, and volcanic cinder and scoria.

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

³Withheld to avoid disclosing company proprietary data; included in "Total."

⁴Includes production reported without a breakdown by end use and estimates for nonrespondents.

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

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	^{r 2} 11	^{r 2} 2,750	^{r 2} \$14,900	^{r 2} \$5.44	8	2,550	\$13,900	\$5.46
Granite	8	3,430	16,900	4.93	5	3,180	16,500	5.17
Sandstone	^{r 1} 13	^{r 1} 3,290	^{r 1} 27,200	^{r 1} 8.25	9	2,500	21,500	8.59
Volcanic cinder	2	W	W	5.44	1	W	W	7.21
Miscellaneous stone	11	W	W	3.29	11	W	W	4.51
Total	XX	10,300	62,000	5.99	XX	8,600	53,600	6.23

^rRevised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.

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

²Includes "Limestone-dolomite," reported with no distinction between the two.

TABLE 4
COLORADO: CRUSHED STONE¹ SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT²

(Thousand metric tons and thousand dollars)

Use	District 2		District 4		District 5		District 6	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:								
Coarse aggregate (+1 1/2 inch) ³	W	W	W	W	30	212	(⁴)	(⁴)
Coarse aggregate, graded ⁵	—	—	W	W	W	W	—	—
Fine aggregate (-3/8 inch) ⁶	W	W	W	W	W	W	—	—
Coarse and fine aggregate ⁷	298	2,700	2,690	13,600	478	3,050	—	—
Agricultural ⁸	(⁴)	(⁴)	—	—	—	—	—	—
Chemical and metallurgical ⁹	(⁴)	(⁴)	(⁴)	(⁴)	—	—	—	—
Special ¹⁰	(⁴)	(⁴)	—	—	—	—	—	—
Unspecified:¹¹								
Actual	(⁴)	(⁴)	(⁴)	(⁴)	845	4,730	(⁴)	(⁴)
Estimated	(⁴)	(⁴)	110	672	421	2,650	—	—
Total	1,130	6,790	5,650	35,900	1,770	10,600	46	280

W Withheld to avoid disclosing company proprietary data; included with "Coarse and fine aggregate."

¹Production reported in District 1 was included with "District 2" to avoid disclosing company proprietary data; no crushed stone was produced in District 3.

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

³Includes filter stone, riprap and jetty stone, and other coarse aggregate.

⁴Withheld to avoid disclosing company proprietary data; included in "Total."

⁵Includes concrete aggregate (coarse), bituminous aggregate (coarse), and railroad ballast.

⁶Includes stone sand (bituminous mix or seal) and screening (undesigned).

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

⁸Includes poultry grit and mineral food.

⁹Includes cement manufacture.

¹⁰Includes asphalt fillers or extenders and mine dusting or acid water treatment.

¹¹Includes production reported without a breakdown by end use and estimates for nonrespondents.

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

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	4,700	\$22,600	\$4.81
Plaster and gunite sands	59	437	7.41
Concrete products (blocks, brick, pipe, decorative, etc.)	180	1,380	7.68
Asphaltic concrete aggregates and other bituminous mixtures	1,700	7,010	4.13
Road base and coverings ²	6,240	20,800	3.33
Fill	1,390	3,180	2.29
Snow and ice control	158	875	5.54
Other ³	563	1,820	3.24
Unspecified:⁴			
Actual	8,120	27,300	3.36
Estimated	5,910	23,100	3.91
Total or average	29,000	109,000	3.74

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

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

³Includes railroad ballast.

⁴Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 6
COLORADO: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT¹

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products ²	422	2,510	1,220	5,200	106	613
Asphaltic/bituminous mixtures	286	1,790	377	1,530	W	W
Road base and coverings ³	2,490	9,300	1,060	3,030	366	819
Fill	359	916	124	344	W	W
Other miscellaneous uses ⁴	11	37	11	55	235	747
Unspecified: ⁵						
Actual	618	2,610	3,510	10,500	127	210
Estimated	1,450	4,820	970	3,680	172	320
Total	5,640	22,000	7,270	24,400	1,010	2,710
	District 4		District 5		District 6	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products ²	2,020	10,500	1,080	4,900	97	714
Asphaltic/bituminous mixtures	280	815	465	2,040	W	W
Road base and coverings ³	563	1,690	682	1,880	1,080	4,070
Fill	485	1,200	371	579	W	W
Other miscellaneous uses ⁴	572	1,980	105	567	127	301
Unspecified: ⁵						
Actual	3,670	13,100	189	783	—	—
Estimated	1,430	6,180	812	3,300	1,080	4,840
Total	9,020	35,500	3,700	14,000	2,380	9,920

W Withheld to avoid disclosing company proprietary data; included with "Other miscellaneous uses."

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

²Includes plaster and gunite sands.

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

⁴Includes railroad ballast and snow and ice control.

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



U. S. Geological Survey Minerals Information

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