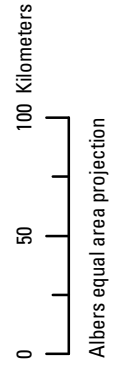
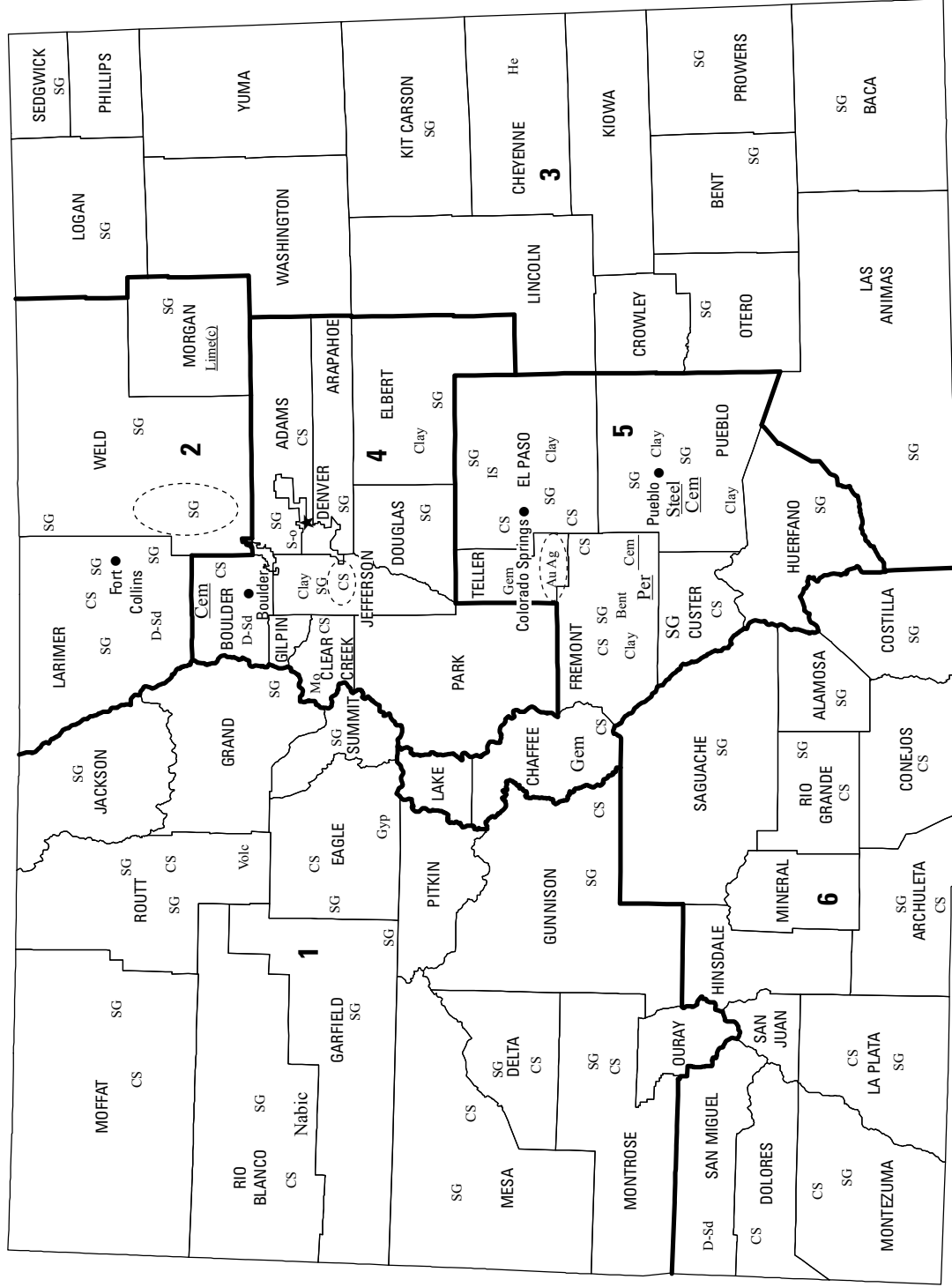




2012–2013 Minerals Yearbook

COLORADO

COLORADO



LEGEND

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

MINERAL SYMBOLS (Principal producing areas)

- Ag Silver
- Au Gold
- Bent Bentonite
- Cem Cement plant
- Clay Common clay
- CS Crushed stone
- D-Sd Dimension sandstone
- Gem Gemstones
- Gyp Gypsum
- He Helium
- IS Industrial sand
- Lime(c) Lime plant (captive)
- Mo Molybdenum
- Nabic Sodium bicarbonate
- Per Perlite plant
- S-o Sulfur (oil)
- SG Construction sand and gravel
- Steel Steel plant
- Volc Volcanic cinder
- Concentration of mineral operations

THE MINERAL INDUSTRY OF COLORADO

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

In 2013, the value of the nonfuel mineral production¹ in the State of Colorado increased to \$2.07 billion from \$1.93 billion in 2012. Colorado's share of the Nation's total nonfuel mineral production was 2.8% in 2013 and 2.5% in 2012. For both years, it ranked 12th among the 50 States in nonfuel mineral production. In 2013, on a per capita basis, nonfuel mineral production in Colorado had a value of \$393 compared with the national average of \$238. In 2012, the per capita value was \$373 compared with the national average of \$241.

The value of nonfuel mineral production in Colorado for the years 2006 through 2013 was as follows (in billions of dollars): \$1.68 (2006), \$2.05 (2007), \$2.06 (2008), \$1.42 (2009), \$1.85 (2010), \$1.95 (2011), \$1.93 (2012), and \$2.07 (2013).

In 2013, there were 2,486 employees in nonfuel mineral mines in Colorado and 738 in mills and preparation plants. In 2012, the corresponding numbers were 2,537 in nonfuel mineral mines and 720 in mills and preparation plants (U.S. Mine Safety and Health Administration, 2013, p. 8; 2014, p. 8). In 2013, the average annual wage in Colorado for all mining was \$82,819 compared with \$51,124 for all industries. In 2012, the corresponding figures were \$85,021 and \$50,916, respectively (National Mining Association, unpub. data, February 4, 2016).

In 2013, on the basis of production quantity, Colorado was the leading State for the production of molybdenum out of 7 producing States, second in the production of fire clay out of 3 producing States, third in the production of gold out of 10 producing States, and fourth in the production of construction sand and gravel and Grade-A helium out of 50 and 4 producing States, respectively.

In 2012, on the basis of production quantity, Colorado was the second-ranked State in the production of molybdenum out of 7 producing States, and third in the production of gold and fire clay out of 10 and 3 producing States, respectively. It was fourth in the production of Grade-A helium out of 5 producing States.

In 2012 and 2013, Colorado also produced bentonite clay, common clay, crude gypsum, crushed stone, dimension stone, industrial sand and gravel, lime, masonry cement, portland cement, and silver (table 1).

Commodity Review

The major nonfuel mineral mines continued operating in Colorado during 2012–13.

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 USGS mineral production data published in this chapter are those available as of February 2016. Data in this report are rounded to three significant digits and percentages are calculated from unrounded data. All USGS Mineral Industry Surveys and USGS Minerals Yearbook chapters—mineral commodity, State, and country—can be retrieved over the Internet at <http://minerals.usgs.gov/minerals>.

Metals

Cripple Creek and Victor Gold Mining Co.'s Cripple Creek and Victor Gold Mine (historically the Cresson Mine), in Teller County, was the leading gold producer in the State. As a result of gold grades gradually decreasing over the years, parts of the open pit that have been exhausted were resloped and reclaimed (George, 2015, p. 31.3).

The Climax Molybdenum Co. operated two facilities: the Henderson Mine in Clear Creek County and the Climax Mine in Lake County, which reopened in May 2012 after being shut down for a 17-year period. The Henderson Mine is a block-caving mining operation feeding a 32,000-metric-ton-per-day (t/d) concentrator. The mill is located 24 kilometers away from and connected to the mine by a conveyor belt that runs beneath the Continental Divide. The molybdenum concentrate from the mill was shipped to Fort Madison, IA, for processing (Polyak, 2015, p. 50.1).

Industrial Minerals

LLC's Natural Soda operation, in Rio Blanco County, produced soda ash and nahcolite by solution mining. In 2013, a plant expansion to double capacity to 227,000 metric tons was completed (Harvey, 2013).

In 2013, according to U.S. Geological Survey (USGS) data, there were 157 construction sand and gravel companies (with 260 operations and 344 pits) and 43 crushed stone operations (with 241 quarries and 40 processing plants) scattered throughout Colorado. In 2012, according to USGS data, there were 158 construction sand and gravel companies (with 262 operations and 342 pits) and 45 crushed stone operations (with 241 quarries and 40 processing plants).

References Cited

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- U.S. Mine Safety and Health Administration, [2014], Mine injury and worktime, quarterly, January–December 2013: U.S. Mine Safety and Health Administration, Final, closeout edition, 34 p. (Accessed February 4, 2016, at http://arweb.msha.gov/Stats/Part50/WQ/MasterFiles/MIWQ%20Master_20135.pdf.)

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

(Thousand metric tons and thousand dollars)

Mineral	2011		2012		2013	
	Quantity	Value	Quantity	Value	Quantity	Value
Clays, common	123	293	235	5,000	228	4,880
Gemstones, natural	NA	440	NA	438	NA	447
Sand and gravel, construction	26,800 ^r	198,000	27,700	209,000	34,500	254,000
Stone:						
Crushed	8,130 ^r	63,300 ^r	7,830	63,800	9,010	74,500
Dimension	5	994	23	10,200	18	7,270
Combined values of cement, clays (bentonite, fire), gold, gypsum (crude), helium (Grade-A), lime, molybdenum concentrates, sand and gravel (industrial), silver	XX	1,680,000	XX	1,650,000	XX	1,730,000
Total	XX	1,950,000 ^r	XX	1,930,000	XX	2,070,000

^rRevised. NA Not available. 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.

TABLE 2
COLORADO: CRUSHED STONE SOLD OR USED IN THE UNITED STATES, BY TYPE¹

Type	2012				2013			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone ²	3	452	\$4,030	\$8.91	4	550	\$4,860	\$8.83
Dolomite	1	44	322	7.33	1	24	195	8.16
Marble	1	67	492	7.33	1	58	476	8.16
Granite	10	4,110	30,900	7.53	9	4,790	33,900	7.08
Traprock	1	4	23	6.25	1	2	10	6.30
Sandstone and quartzite ⁴	4	1,920	15,600	8.10	4	2,360	19,900	8.41
Volcanic cinder and scoria	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Miscellaneous stone	220	1,230	12,400	10.11	221	1,220	15,200	12.43
Total or average	XX	7,830	63,800	8.15	XX	9,010	74,500	8.27

XX Not applicable.

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

²Includes limestone-dolomite reported with no distinction between the two kinds of stone.

³Withheld to avoid disclosing company proprietary data; included with "Miscellaneous stone."

⁴Includes sandstone-quartzite reported with no distinction between the two kinds of stone.

TABLE 3
 COLORADO: CRUSHED STONE SOLD OR USED BY PRODUCERS, BY USE¹

Use	2012			2013		
	Quantity (thousand metric tons)	Value (thousands)	Unit value	Quantity (thousand metric tons)	Value (thousands)	Unit value
Construction:						
Coarse aggregate (+1½ inch):						
Riprap and jetty stone	99	\$946	\$9.55	254	\$3,480	\$13.68
Filter stone	W	W	W	77	790	10.19
Unspecified coarse aggregate	W	W	W	W	W	W
Coarse aggregate, graded:						
Concrete aggregate, coarse	W	W	W	W	W	W
Bituminous aggregate, coarse	201	1,830	9.11	331	2,300	6.95
Bituminous surface-treatment aggregate	--	--	--	31	536	17.13
Railroad ballast	--	--	--	4	70	16.39
Unspecified graded coarse aggregate	--	--	--	811	8,830	10.88
Fine aggregate (-3/8 inch):						
Stone sand, concrete	W	W	W	W	W	W
Stone sand, bituminous mix or seal	W	W	W	W	W	W
Screening, undesignated	W	W	W	W	W	W
Unspecified fine aggregate	--	--	--	267	825	3.09
Coarse and fine aggregates:						
Graded road base or subbase	384	2,390	6.21	591	2,640	4.47
Terrazzo and exposed aggregate	8	60	7.46	124	2,960	23.81
Crusher run or fill or waste	129	213	1.65	970	5,500	5.67
Unspecified and other construction materials	54	614	11.37	45	336	7.40
Special:						
Mining dusting or acid water treatment	48	743	15.47	W	W	W
Other miscellaneous uses and specified uses not listed	27	198	7.33			
Unspecified:²						
Reported	4,650	36,800	7.90	3,410	28,400	8.34
Estimated	1,890	17,800	9.41	1,580	12,200	7.75
Total or average	7,830	63,800	8.15	9,010	74,500	8.27

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

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

²Reported and estimated production without a breakdown by end use.

TABLE 4
 COLORADO: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2012, BY USE AND DISTRICT¹

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction:						
Coarse aggregate (+1½ inch) ²	W	W	--	--	--	--
Coarse aggregate, graded ⁴	--	--	--	--	--	--
Fine aggregate (-¾ inch) ⁵	--	--	--	--	--	--
Coarse and fine aggregates ⁶	W	W	--	--	--	--
Other construction materials	45	517	--	--	--	--
Agricultural	--	--	--	--	--	--
Chemical and metallurgical	--	--	--	--	--	--
Special ⁷	--	--	--	--	--	--
Other miscellaneous uses and specified uses not listed ⁸	27	198	--	--	--	--
Unspecified: ⁹						
Reported	--	--	--	--	--	--
Estimated	472	3,250	180	1,320	--	--
Total	556	4,090	180	1,320	--	--
Use	District 4		District 5		District 6	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction:						
Coarse aggregate (+1½ inch) ²	--	--	W	W	(3)	3
Coarse aggregate, graded ⁴	W	W	274	2,310	5	48
Fine aggregate (-¾ inch) ⁵	W	W	W	W	--	--
Coarse and fine aggregates ⁶	W	W	W	W	15	93
Other construction materials	--	--	9	98	--	--
Agricultural	--	--	--	--	--	--
Chemical and metallurgical	--	--	--	--	--	--
Special ⁷	--	--	48	743	--	--
Other miscellaneous uses and specified uses not listed ⁸	--	--	--	--	--	--
Unspecified: ⁹						
Reported	4,630	36,700	--	--	--	--
Estimated	952	11,200	274	1,900	12	86
Total	5,700	49,300	1,340	8,840	32	230
Use	Unspecified districts					
	Quantity	Value				
Construction:						
Coarse aggregate (+1½ inch) ²	--	--				
Coarse aggregate, graded ⁴	--	--				
Fine aggregate (-¾ inch) ⁵	--	--				
Coarse and fine aggregates ⁶	--	--				
Other construction materials	--	--				
Agricultural	--	--				
Chemical and metallurgical	--	--				
Special ⁷	--	--				
Other miscellaneous uses and specified uses not listed ⁸	--	--				
Unspecified: ⁹						
Reported	28	36				
Estimated	--	--				
Total	28	36				

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.

²Includes riprap and jetty stone, filter stone, and unspecified coarse aggregate.

³Less than ½ unit.

⁴Includes concrete aggregate (coarse) and bituminous aggregate (coarse).

⁵Includes stone sand (concrete), stone sand (bituminous mix or seal), and screening (undesigned).

⁶Includes graded road base or subbase, terrazzo and exposed aggregate, crusher run, and unspecified coarse and fine aggregates.

⁷Includes mine dusting or acid water treatments.

⁸Includes drain fields, waste material, lightweight aggregate (slate), pipe bedding, refractory stone (including ganister), and other miscellaneous uses.

⁹Reported and estimated production without a breakdown by end use.

TABLE 5
 COLORADO: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2013, BY USE AND DISTRICT¹

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction:						
Coarse aggregate (+1½ inch) ²	W	W	--	--	--	--
Coarse aggregate, graded ³	W	W	--	--	--	--
Fine aggregate (-¾ inch) ⁴	W	W	--	--	--	--
Coarse and fine aggregates ⁵	W	W	--	--	--	--
Other construction materials	46	336	--	--	--	--
Agricultural	--	--	--	--	--	--
Chemical and metallurgical	--	--	--	--	--	--
Special ⁶	--	--	--	--	--	--
Other miscellaneous uses and specified uses not listed ⁷	--	--	--	--	--	--
Unspecified: ⁸						
Reported	1	6	--	--	--	--
Estimated	380	2,460	200	1,630	--	--
Total	603	6,110	200	1,630	--	--
Use	District 4		District 5		District 6	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction:						
Coarse aggregate (+1½ inch) ²	W	W	W	W	W	W
Coarse aggregate, graded ³	W	W	W	W	W	W
Fine aggregate (-¾ inch) ⁴	W	W	W	W	W	W
Coarse and fine aggregates ⁵	W	W	W	W	W	W
Other construction materials	--	--	W	W	--	--
Agricultural	--	--	--	--	--	--
Chemical and metallurgical	--	--	--	--	--	--
Special ⁶	--	--	W	W	--	--
Other miscellaneous uses and specified uses not listed ⁷	--	--	--	--	--	--
Unspecified: ⁸						
Reported	3,390	28,400	--	--	2	14
Estimated	466	3,800	515	4,200	14	113
Total	6,770	56,500	1,350	9,400	72	779
Use	Unspecified districts					
	Quantity	Value				
Construction:						
Coarse aggregate (+1½ inch) ²	--	--				
Coarse aggregate, graded ³	--	--				
Fine aggregate (-¾ inch) ⁴	--	--				
Coarse and fine aggregates ⁵	--	--				
Other construction materials	--	--				
Agricultural	--	--				
Chemical and metallurgical	--	--				
Special ⁶	--	--				
Other miscellaneous uses and specified uses not listed ⁷	--	--				
Unspecified: ⁸						
Reported	13	27				
Estimated	--	--				
Total	13	27				

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.

²Includes riprap and jetty stone, filter stone, and unspecified coarse aggregate.

³Includes concrete aggregate (coarse) and bituminous aggregate (coarse).

⁴Includes stone sand (concrete), stone sand (bituminous mix or seal), and screening (undesigned).

⁵Includes graded road base or subbase, terrazzo and exposed aggregate, crusher run, and unspecified coarse and fine aggregates.

⁶Includes mine dusting or acid water treatments.

⁷Includes drain fields, waste material, lightweight aggregate (slate), pipe bedding, refractory stone (including ganister), and other miscellaneous uses.

⁸Reported and estimated production without a breakdown by end use.

TABLE 6
 COLORADO: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2012,
 BY MAJOR USE CATEGORY¹

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	2,680	\$20,200	\$7.54
Plaster and gunitite sands	29	193	6.66
Concrete products (blocks, bricks, pipe, decorative, and so forth)	128	534	4.17
Asphaltic concrete aggregates and other bituminous mixtures	553	4,250	7.69
Road base and coverings	4,470	30,200	6.76
Road and other stabilization (cement)	11	81	7.36
Fill	608	1,950	3.21
Snow and ice control	106	2,130	20.09
Other miscellaneous uses ²	123	1,200	9.76
Unspecified: ³			
Reported	9,320	73,600	7.90
Estimated	9,670	74,300	7.68
Total or average	27,700	209,000	7.55

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

²Includes filtration and railroad ballast.

³Reported and estimated production without a breakdown by end use.

TABLE 7
 COLORADO: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2013,
 BY MAJOR USE CATEGORY¹

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	4,940	\$36,000	\$7.29
Plaster and gunitite sands	50	539	10.78
Concrete products (blocks, bricks, pipe, decorative, and so forth)	128	810	6.33
Asphaltic concrete aggregates and other bituminous mixtures	514	3,550	6.91
Road base and coverings	4,460	31,400	7.04
Road and other stabilization (cement and lime)	72	496	6.89
Fill	1,050	3,850	3.68
Snow and ice control	92	2,120	23.01
Other miscellaneous uses ²	244	2,270	9.29
Unspecified: ³			
Reported	9,690	71,500	7.37
Estimated	13,200	101,000	7.67
Total or average	34,500	254,000	7.37

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

²Includes railroad ballast.

³Reported and estimated production without a breakdown by end use.

TABLE 8
 COLORADO: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2012, 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	414	5,940	W	W	W	W
Asphaltic concrete aggregates and road base materials ³	1,260	11,100	W	W	W	W
Fill	91	453	279	984	5	20
Other miscellaneous uses ⁴	76	1,710	6	36	--	--
Unspecified: ⁵						
Reported	1,310	11,100	5,020	40,600	--	--
Estimated	1,340	10,300	2,470	19,000	1,930	14,800
Total	4,490	40,600	10,100	73,900	2,300	16,800
Use	District 4		District 5		District 6	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products ²	W	W	W	W	71	577
Asphaltic concrete aggregates and road base materials ³	W	W	W	W	639	5,230
Fill	29	46	173	296	29	144
Other miscellaneous uses ⁴	76	852	61	629	10	100
Unspecified: ⁵						
Reported	1,580	14,400	459	3,210	329	2,900
Estimated	1,050	8,080	2,240	17,200	647	4,960
Total	3,650	28,800	4,830	33,100	1,720	13,900
Use	Unspecified districts					
	Quantity	Value				
Concrete aggregate and concrete products ²	--	--				
Asphaltic concrete aggregates and road base materials ³	--	--				
Fill	2	4				
Other miscellaneous uses ⁴	--	--				
Unspecified: ⁵						
Reported	622	1,360				
Estimated	--	--				
Total	624	1,360				

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.

²Includes plaster and gunite sands.

³Includes road and other stabilization (cement).

⁴Includes filtration, railroad ballast, and snow and ice control.

⁵Reported and estimated production without a breakdown by end use.

TABLE 9
 COLORADO: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2013, 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	291	3,980	W	W	W	W
Asphaltic concrete aggregates and road base materials ³	1,010	9,310	W	W	W	W
Fill	56	348	662	2,550	10	154
Other miscellaneous uses ⁴	129	1,940	--	--	11	250
Unspecified: ⁵						
Reported	1,410	12,200	5,130	40,800	--	--
Estimated	3,650	29,900	2,540	18,700	1,750	13,300
Total	6,530	57,600	11,700	86,100	2,000	15,600
Use	District 4		District 5		District 6	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products ²	W	W	W	W	58	573
Asphaltic concrete aggregates and road base materials ³	W	W	W	W	292	2,270
Fill	133	297	182	491	2	12
Other miscellaneous uses ⁴	128	1,440	68	756	--	--
Unspecified: ⁵						
Reported	763	7,640	456	3,060	535	4,720
Estimated	1,240	9,310	2,730	20,800	1,170	9,240
Total	5,260	36,600	5,330	37,800	2,060	16,800
Use	Unspecified districts					
	Quantity	Value				
Concrete aggregate and concrete products ²	--	--				
Asphaltic concrete aggregates and road base materials ³	--	--				
Fill	--	--				
Other miscellaneous uses ⁴	--	--				
Unspecified: ⁵						
Reported	1,400	3,080				
Estimated	155	324				
Total	1,550	3,410				

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.

²Includes plaster and gunite sands.

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

⁴Includes railroad ballast, and snow and ice control.

⁵Reported and estimated production without a breakdown by end use.