THE MINERAL INDUSTRY OF WYOMING

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

In 1999 the preliminary estimated value[1] of nonfuel mineral production for Wyoming was $956 million, according to the U.S. Geological Survey (USGS). This was about an 11% decrease from that of 1998,[2] and followed a 4.5% decrease from 1997 to 1998. The State ranked 16th (12th in 1998) among the 50 States in total nonfuel mineral production value, of which Wyoming accounted for about 2.5% of the U.S. total.

Wyoming's leading nonfuel mineral, by value, was soda ash, followed by bentonite, Grade-A helium, and portland cement. In 1999, decreases in the values of soda ash, bentonite, and construction sand and gravel accounted for nearly all lowered mineral values for the year; gemstones had a very small decrease. (Listings based on value are by descending order of change.) All other mineral commodities increased in value, led by increases in crushed stone, Grade-A helium, and portland cement. In 1998, a decrease in the value of soda ash and bentonite accounted for most the State's decrease in value; common clay increased slightly. All other minerals, led by construction sand and gravel, portland cement, lime, and crushed stone, increased in value.

Based upon USGS estimates of the quantities of minerals produced in the 50 States during 1999, Wyoming remained first in soda ash and bentonite and second in Grade-A helium. Soda ash (sodium carbonate) is an inorganic chemical extensively used in the manufacture of glass, paper, soap and detergents, and textiles, and as sodium bicarbonate in food products. The United States is the world's largest producer of soda ash. Wyoming, one of only two producing States, is home to the world's largest known natural deposit of trona. Trona is the principal ore from which soda ash is produced. California produces a significantly smaller quantity of natural soda ash. In the past several years Wyoming has had considerable exploration activity for metals but has not had significant metal production since iron ore mining ceased in April 1984.

The Wyoming State Geological Survey (WSGS) provided the following narrative information.[3] Georgia Marble Co., which produces white marble aggregate from its Wheatland, WY, quarry and plant, changed the name of its operations to Imerys Marble, Inc. The company continues to produce a range of sizes, including fines for pigment, at its Wyoming operations. Guernsey Stone, Inc. and at least four other operators in Wyoming produce small amounts of decorative aggregate. In addition, several operators shipped landscape rock (boulders, fieldstone, and moss rock) in 1999 to markets mostly in the Colorado Front Range but also to California and Illinois.

Pete Lien and Sons, Inc., which supplies emissions control limestone to the Missouri Basin Power Project's coal-fired electricity generating plant north of Wheatland, began production of limestone used in the refining of sugar beets at its Hartville quarry in 1999. Exploration for additional chemical grade and aggregate quality limestone resources continued, especially near the limestone and aggregate poor Powder River Basin.

Railroad ballast is an important construction material produced at Meridian Aggregate Co.'s Granite Canyon quarry west of Cheyenne, by Neosho Construction Co., Inc. at the Bald Butte quarry in Niobrara County and by Guernsey Stone, Inc. at Guernsey. The Bald Butte quarry was reactivated in 1999 to provide materials for the upgrading of the Union Pacific Railroad line between Lusk, WY, and Morrill, NE.

Soda ash and other sodium compound production from mined trona was less in 1999 than in the record year of 1997. This decline was due mainly to smaller orders for soda ash from the Far East.

Bentonite production continued at near record levels in 1999. Expanding markets for most uses of bentonite contributed to this increase, especially the growing market for kitty litter.

Addwest Minerals Inc. continued to test market zeolite mined in Wyoming. In 1999, two additional companies were exploring for zeolite minerals in the Beaver Divide area of central Wyoming and the Tatman Mountain area in the central Bighorn Basin.

The WSGS has upgraded and added information about various industrial minerals to its website. The URL for this information is http://www.wsgsweb.uwyo.edu/minerals/about.htm.

Exploration and expansion continued for dimensional stone resources in Wyoming. Raven Quarries Llc., which produces a pink swirled granite called Mirage, ceased production of its black granite, called Wyoming Raven, until additional orders are received. Raven Quarries ships most of its quarried blocks to Western Granite Co. Ltd. in Tijuana, Mexico, for processing.

---

[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending upon 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 1999 USGS mineral production data published in this chapter are preliminary estimates as of May 2000, and are expected to change. For some mineral commodities, such as, 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 URL 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 URL http://minerals.usgs.gov/minerals; facsimile copies may be obtained from MINES FaxBack.

[2]Values, percentage calculations, and rankings for 1998 may vary from the Minerals Yearbook, Area Reports: Domestic 1998, Volume II, owing to the revision of preliminary 1998 to final 1998 data. Data for 1999 are preliminary and are expected to change; related rankings may also be subject to change.

[3]Ray E. Harris, Staff Geologist-Industrial Minerals and Uranium, and W. Daniel Hausel, Senior Economic Geologist-Metals and Precious Stones, both of the Wyoming State Geological Survey, coauthored the text of mineral industry information submitted by the agency.

At yearend, one Italian company was obtaining permits to quarry a dimensional limestone near Laramie. Mediterranean Indian Atlantic Stone of Wyoming (MIAS-WY) established an office in Cheyenne. By yearend, MIAS-WY had acquired property and exploration permits for granite, marble, and limestone quarry sites and was negotiating for land in or near Laramie for the construction of a small fabricating plant. Strid Marble and Granite Co., in Cheyenne, constructed a custom stone fabricating plant capable of processing 27 metric tons per day (t/d) of rock into slab and polishing 54 t/d of slab. Raven Quarries has shipped some Mirage granite to Strid Marble and Granite for processing.

During 1999, the WSGS completed a map of the Barlow Gap quadrangle south of the Rattlesnake Hills in the northern Granite Mountains of central Wyoming. The map was completed under a State map contract with the USGS. This region has considerable potential for the discovery of gold mineralization and gemstones.

Research by the WSGS identified several new gemstone localities in the State during the past few years. Some of the better gemstones in Wyoming include corundum, diamond, garnet, iolite, jade, and peridot. These and many other gems are the discussion of a new publication by the WSGS "Gemstones and other unique minerals and rocks of Wyoming—A field guide for collectors," WSGS Bulletin 71, which was scheduled to be published in the summer of 2000.

Some gemstones from the Red Dwarf ruby deposit near Jeffrey City in the southern Granite Mountains were cut into spectacular gems by a consultant from Casper. These gemstones weighed several carats.

A 700,000-hectare area covering portions of the Laramie and Medicine Bow Mountains, and the Sierra Madre was investigated for mineral occurrences, prospects, and historic mines by the WSGS. The project was funded by the USGS.

Work completed on the Medicine Bow National Forest showed this Forest in southeastern Wyoming to have potential for the occurrence of diamond and base and precious metal resources in both visible and blind ore deposits (Sutherland, W.M., and Hausel, W.D., Wyoming State Geological Survey, December 9, 1999, 1999 Mineral Resource Survey of the Medicine Bow National Forest, accessed February 7, 2001, at URL http://www.wsgsweb.uwyo.edu/metals/Mineral_survey_medbow/survey_med_bow.htm). Many mines and anomalies were identified during the project. The entire Medicine Bow National Forest is identified as having high to moderate potential for occurrence of diamondiferous kimberlite. This is based on favorable geology, the discovery of kimberlitic indicator (pathfinder) minerals in some samples, and the presence of the two largest kimberlite districts in the United States within 16 and 32 kilometers of the forest boundary.

South of a major shear zone, in the southern portion of the Medicine Bow Mountains and the Sierra Madre, ancient volcanic rocks provide excellent hosts for massive sulfide mineralization (containing copper, gold, lead, silver, and zinc) of magmatic origin, with some shear zone copper, gold, and associated gold placers. Many gold and copper deposits, prospects, and historic mines lie along the shear zone. Chromium, copper, gold, silver, palladium, platinum, titanium, and vanadium were identified at a few localities in the Forest.

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

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral	1997		1998		1999 p/	
	Quantity	Value	Quantity	Value	Quantity	Value
Clays:						
Bentonite	3,340	140,000	3,150	145,000	3,160	137,000
Common	W	W	W	W	W	W
Gemstones	NA	11	NA	14	NA	13
Sand and gravel: Construction	3,090	12,300	4,770	18,100	3,690	14,300
Stone: Crushed	5,010	30,700	5,580	31,600	6,200	36,000
Zeolites metric tons	(3/)	NA	(3/)	NA	NA	NA
Combined values of cement (portland), gypsum (crude), helium (Grade-A), lime, soda ash, and values indicated by symbol W	XX	938,000	XX	879,000	XX	769,000
Total	XX	1,120,000	XX	1,070,000	XX	956,000

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 no more than three significant digits; may not add to totals shown.
3/ Withheld to avoid disclosing company proprietary data.

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

Kind	1997 Number of quarries	1997 Quantity (thousand metric tons)	1997 Value (thousands)	1997 Unit value	1998 Number of quarries	1998 Quantity (thousand metric tons)	1998 Value (thousands)	1998 Unit value
Limestone	4 r/	725 r/	$2,920 r/	$4.03 r/	7	643	$2,960	$4.60
Dolomite	1	W	W	4.89	1	W	W	4.66
Granite	2	W	W	6.30	2	W	W	5.99
Marble	1	104	3,280	31.53	1	W	W	6.09
Quartzite	4	W	W	11.91	1	W	W	12.16
Traprock	5	W	W	3.97	--	--	--	--
Volcanic cinder and scoria	1	W	W	6.17	1	W	W	6.22
Miscellaneous stone	1	97	577	5.95	4	332	1,290	3.89
Total or average	XX	5,010	30,700	6.13	XX	5,580	31,600	5.66

r/ Revised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable. -- Zero.
1/ Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.

TABLE 3
WYOMING: CRUSHED STONE SOLD OR USED BY PRODUCERS
IN 1998, BY USE 1/ 2/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Riprap and jetty stone	W	W	$8.71
Other coarse aggregate	36	$292	8.11
Coarse aggregate, graded:			
Concrete aggregate, coarse	144	820	5.70
Bituminous aggregate, coarse	W	W	6.14
Railroad ballast	W	W	4.08
Other graded coarse aggregate	319	1,920	6.01
Fine aggregate (-3/8 inch):			
Stone sand, concrete	11	37	3.36
Stone sand, bituminous mix or seal	W	W	3.31
Screening, undesignated	W	W	3.30
Other fine aggregate	504	1,670	3.30
Coarse and fine aggregates:			
Graded road base or subbase	19	63	3.32
Other coarse and fine aggregates	157	1,820	11.59
Chemical and metallurgical: Cement manufacture	(3/)	(3/)	4.07
Unspecified: 4/			
Actual	3,550	21,500	6.05
Estimated	(3/)	(3/)	6.00
Total or average	5,580	31,600	5.66

W Withheld to avoid disclosing company proprietary data; included with "Other."
1/ Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.
2/ Includes dolomite, granite, limestone, marble, miscellaneous stone, quartzite, traprock, and volcanic cinder and scoria.
3/ Withheld to avoid disclosing company proprietary data; included in "Total."
4/ Reported and estimated production without a breakdown by end use.

TABLE 4
WYOMING: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1998,
BY USE AND DISTRICT 1/

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		Unspecified districts	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:						
Coarse aggregate (+1 1/2 inch) 2/	W	W	W	W	--	--
Coarse aggregate, graded 3/	--	--	462	2,740	--	--
Fine aggregate (-3/8 inch) 4/	--	--	514	1,700	--	--
Coarse and fine aggregate 5/	W	W	W	W	--	--
Other construction materials	154	1,820	59	359	--	--
Chemical and metallurgical 6/	--	--	(7/)	(7/)	--	--
Unspecified: 8/						
Actual	--	--	3,470	21,000	86	473
Estimated	--	--	(7/)	(7/)	--	--
Total	154	1,820	5,340	29,300	86	473

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials." -- Zero.
1/ Data are rounded to no more than three significant digits; may not add to totals shown.
2/ Includes riprap and jetty stone and other coarse aggregate.
3/ Includes concrete aggregate (coarse), bituminous aggregate (coarse), railroad ballast, and other graded coarse aggregate.
4/ Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesignated), and other fine aggregate.
5/ Includes graded road base or subbase and other coarse and fine aggregates.
6/ Includes cement manufacture.
7/ Withheld to avoid disclosing company proprietary data; included in "Total."
8/ Reported and estimated production without a breakdown by end use.

TABLE 5
WYOMING: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1998,
BY MAJOR USE CATEGORY 1/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate 2/	467	$2,030	$4.34
Concrete products (blocks, bricks, pipe, decorative, etc.)	18	89	4.94
Asphaltic concrete aggregates and other bituminous mixtures	354	3,020	8.52
Road base and coverings 3/	1,110	3,960	3.58
Fill	61	113	1.85
Snow and ice control	34	125	3.68
Other miscellaneous uses	57	255	4.47
Unspecified: 4/			
Actual	1,980	4,500	2.27
Estimated	690	4,030	5.84
Total or average	4,770	18,100	3.80

1/ Data are rounded to no more than three significant digits; may not add to totals shown.
2/ Includes plaster and gunite sands.
3/ Includes road and other stabilization (cement and lime).
4/ Reported and estimated production without a breakdown by end use.

TABLE 6
WYOMING: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1998,
BY USE AND DISTRICT 1/

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		Unspecified districts 2/	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products 3/	196	1,130	290	983	--	--
Aspaltic concrete aggregates and other bituminous mixtures	W	W	W	W	--	--
Road base and coverings 4/	763	3,060	342	906	--	--
Fill	18	41	43	72	--	--
Other miscellaneous uses 5/	W	W	W	W	--	--
Unspecified 6/	658	3,180	483	2,820	1,530	2,530
Total	1,960	10,300	1,270	5,280	1,530	2,530

W Withheld to avoid disclosing company proprietary data; included in "Total." -- Zero.
1/ Data are rounded to no more than three significant digits; may not add to totals shown.
2/ Includes production within the State with no district reported.
3/ Includes plaster and gunite sands.
4/ Includes road and other stabilization (cement and lime).
5/ Includes snow and ice control.
6/ Reported and estimated production without a breakdown by end use.