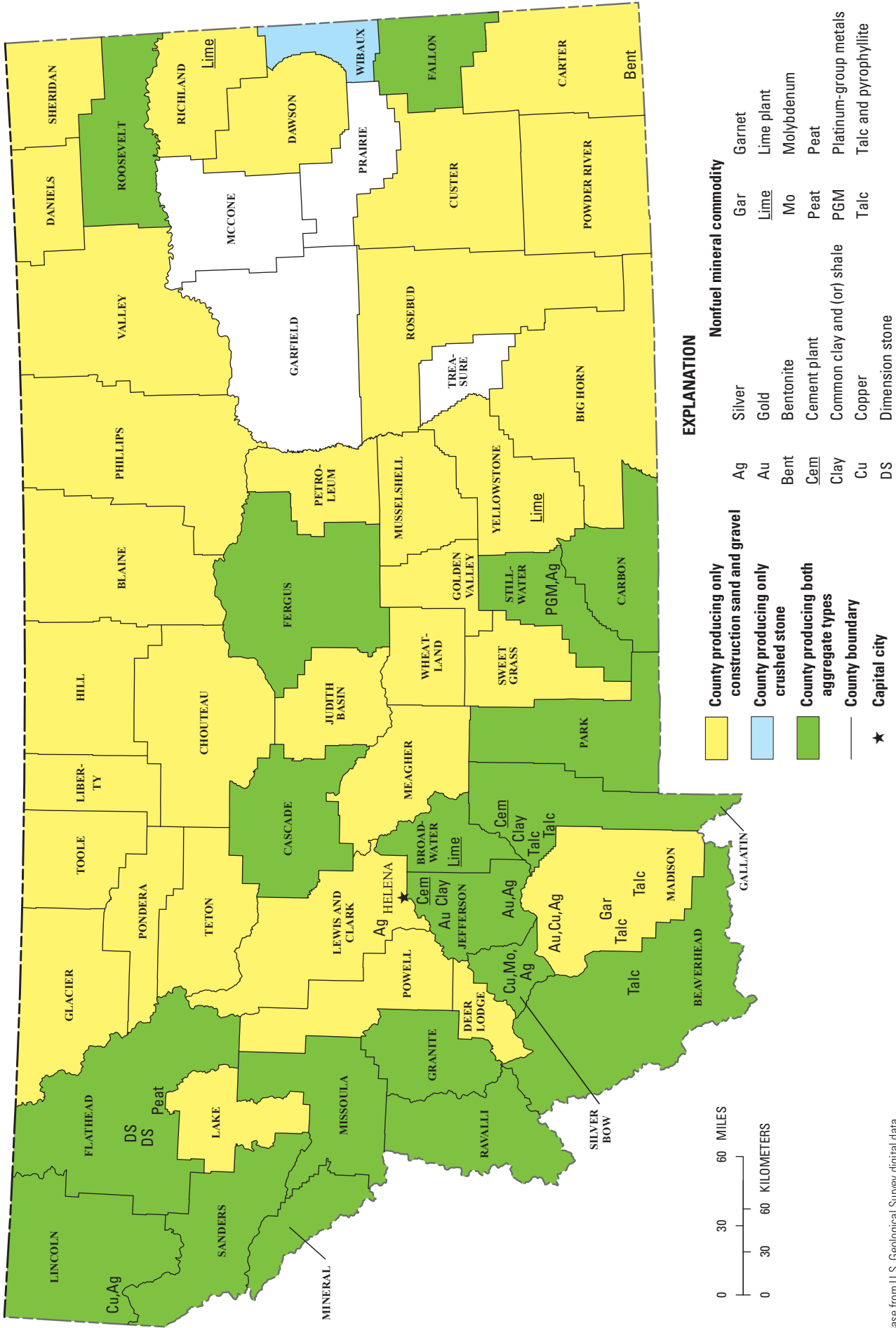




2014 Minerals Yearbook

MONTANA [ADVANCE RELEASE]



Base from U.S. Geological Survey digital data
 Albers Equal-Area Conic projection

Figure 1. Map showing major nonfuel-mineral-producing areas in Montana in 2014. Sources: Montana Bureau of Mines and Geology and U.S. Geological Survey.

THE MINERAL INDUSTRY OF MONTANA

By Madan M. Singh

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 2014, in the State of Montana (fig. 1), the value of the nonfuel mineral production¹ was \$1.30 billion. This was a slight decrease from the State's nonfuel mineral production value of \$1.31 billion in 2013 (table 1). Nonfuel mineral production in the State surpassed \$1 billion in value in 2006 but fell below that figure in 2009; it has been above that since then (fig. 2). Montana accounted for approximately 1.6% of the total U.S. production value in 2014, which ranked it 20th among the 50 States. On a per capita basis, Montana had a value of \$1,270 in 2014 compared with the national average of \$252. In 2014, the number of nonfuel mineral mines and mine employment decreased (table 2).

In 2014, the leading five minerals in production quantity in the State, in alphabetical order, were copper, gold, molybdenum, palladium, and platinum. At fiscal yearend 2014, there were 15,784 claims active in the State covering 135,269 hectares (334,524 acres) (Bureau of Land Management, 2015, p. 140).

Events, Trends, and Issues

The following information is abstracted from Montana Mining Association (2016):

- In 2014, Barrick's Golden Sunlight Mine total open pit production was 6.7 million metric tons (Mt) and the mill processed 2.2 Mt of ore. The mine produced 2,680 kilograms (kg) of gold. The mill also processed 90,700 metric tons (t) of offsite ore from 13 sources.
- Montana Resources LLP operated the Berkeley and Continental pits to produce copper-molybdenum ore. The copper ore was concentrated to 26%–32% and the molybdenum to 54%–57%, and shipped for further refinement. In 2014, the main crusher, conveyor tripper, and tailings line through the yard required repairs; complete replacements were planned in 2015.
- The Imerys Talc Yellowstone Mine in the Madison Valley was a one-shift-per-day operation and produced around 204,000 metric tons per year of crude talc ore. The mine ore was sent to either Three Forks [110 kilometers (km) from the mine] or Sappington (95 km from the mine), both of which are Imerys facilities.
- Garnet USA (owned by the GMA Garnet Group), located near Alder, was mined by open pit methods, and the garnet was separated from the gangue by using water,

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 June 2017. 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>.

gravity, and magnetism. Crushed garnet from the mine was exported or used domestically.

- On April 7, 2014, the cement companies Holcim Inc. and Lafarge S.A. agreed to merge. The merger was approved by the Federal Trade Commission (FTC) on the condition that certain assets be divested, which included the Trident cement plant in Montana, later purchased by CRH International.
- Ash Grove Cement uses limestones of the Madison Group, which had been upthrust by the Boulder batholith. The Lodgepole Formation is a low-grade limestone with chemistry very conducive for manufacturing cement.
- Graymont Limestone Quarry produced high-calcium and dolomite lime, hydrated lime, precipitated calcium carbonate, pulverized limestone, and construction stone.
- The Stillwater Mining Co. (SMC) continued developing the Blitz area, which is expected to provide extensive new mining infrastructure along the J-M Reef. The Benbow access portal continued to be developed at the far end of the tunnel and will provide ventilation and emergency egress for the Blitz development area. SMC had a recycling facility for catalytic converters and platinum-group metals as part of its sustainability effort.
- Tintina Resources has a high-quality copper resource at Black Butte with a measured and indicated resource of 11.6 Mt at 3.6% copper (Cu) at the Johnny Lee deposit, that is nearly 418,000 t of Cu. Tintina plans a 3,300-metric-ton-per-day (t/d) "drift and fill" underground mining operation. Copper-rich rock will pass through a standard flotation mill, producing approximately 400 t/d of chalcopyrite concentrate (24% Cu). No water that does not meet Montana's strict, nondegradation standards is expected to leave the mine site.
- Revett Mining Co. had its Troy Mine on care-and-maintenance status during 2014 and was developing the silver-copper Rock Creek project 8 km northeast of Noxon, Sanders County.
- In 2014, the production quantity of construction sand and gravel in Montana decreased by 17.3% and crushed stone increased by 8% from the previous year (table 1).

Aggregates by State and End Use

A companion dataset, "Aggregates by State and End Use," replaces the discrete aggregate tables that were included in the individual State chapters prior to 2014 and is available on the State Minerals Statistics and Information web page at <https://minerals.usgs.gov/minerals/pubs/state/>. This dataset is updated annually.

References Cited

Bureau of Land Management, 2015, Public land statistics, 2014: Bureau of Land Management, v. 199, May, 269 p. (Accessed May 23, 2018, at <https://www.blm.gov/sites/blm.gov/files/pls2014.pdf>.)

Montana Mining Association, 2016, Montana mining 2015–16: Winnipeg, Manitoba, Canada, DEL Communications Inc., 90 p. (Accessed May 22, 2018, at http://www.montanamining.org/wp-content/uploads/mtmining_2016.pdf.)

TABLE 1
NONFUEL MINERAL PRODUCTION IN MONTANA^{1, 2, 3}

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral	2012		2013		2014	
	Quantity	Value	Quantity	Value	Quantity	Value
Gemstones, natural ^c	NA	532	NA	539	NA	544
Palladium ⁴ kilograms	12,300	257,000	12,600	295,000	12,400	324,000
Platinum ⁴ do.	3,670	184,000	3,720	178,000	3,660	163,000
Sand and gravel, construction	12,500 ^r	93,100 ^r	12,700 ^r	96,300 ^r	10,500	86,700
Stone:						
Crushed	2,810 ^r	30,300 ^r	2,690	26,000 ^r	2,910	26,100
Dimension	14	1,360	31	1,590	28	1,970
Combined values of cement, clays (bentonite and common), copper, garnet (industrial), gold, iodine, lime, molybdenum concentrates, rhenium, ⁵ silver, talc (crude), tungsten	XX	889,000	XX	710,000 ^r	XX	693,000
Total	XX	1,460,000 ^r	XX	1,310,000	XX	1,300,000

^cEstimated. ^rRevised. do. Ditto. NA Not available. XX Not applicable.

¹Includes data available through June 2017.

²Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

³Data are rounded to no more than three significant digits; may not add to totals shown.

⁴Recoverable content of ores and concentrates.

⁵Rhenium contained in molybdenite concentrates.

TABLE 2
MINING ACTIVITY IN MONTANA

Mining activity	2012	2013	2014
State rank ¹	16	19	20
Employment, number: ²			
Nonfuel mineral mines	2,716	2,703	2,518
Mills and plants	770	737	716
Number of nonfuel mineral mines ²	299	278	272
Number of mills and plants ²	23	19	21
Average annual wage, all mining ³	dollars per year	79,843	83,873
Average annual wage, all industries ³	do.	35,983	36,499
Per capita value ^{1, 4}	dollars per person	1,450	1,290
National per capita value ¹	do.	241	236

do. Ditto.

¹Based on unadjusted State total value.

²Source: U.S. Mine Safety and Health Administration.

³Source: National Mining Association.

⁴Data rounded to no more than three significant digits.

TABLE 3
STRUCTURE OF THE NONFUEL MINERAL INDUSTRY IN MONTANA

(Nonfuel-mineral-producing companies, not including aggregate producers)

Commodity	Company	County
Cement	Ash Grove Cement Co. (Montana City plant)	Jefferson
Do.	Holcim Inc. (Trident/Three Forks plant)	Gallatin
Clays:		
Bentonite	Bentonite Performance Minerals	Carter
Common	Ash Grove Cement Co. (Montana City plant)	Jefferson
Do.	Holcim Inc.	Gallatin
Copper, molybdenum, silver	Montana Resources LLP	Silver Bow
Garnet	Ruby Valley Garnet LLC	Madison
Gemstones: ¹		
Agate	Various	Various
Sapphire	do.	Do.
Gold and silver	Barrick Gold Corp.	Jefferson
Lime	American Crystal Sugar Co.	Richland
Do.	Graymont Inc.	Broadwater
Do.	Western Sugar Cooperative Inc.	Yellowstone
Platinum-group metals and silver	Stillwater Mining Co.	Stillwater
Peat	Martins Peat Inc.	Flathead
Stone, dimension	Glacier Stone Supply LLC	Do.
Do.	Montana Rockworks Inc	Do.
Talc and pyrophyllite	Barretts Minerals Inc.	Beaverhead, Madison
Do.	Imerys S.A.	Madison
Do.	Luzenac America Inc.	Gallatin (2 operations)

Do., do. Ditto.

¹Most natural gemstone producers in the United States are small businesses that are widely dispersed and operate independently.

EXPLANATION

- Other
- Clays (bentonite)
- Palladium metal
- Platinum metal
- Sand and gravel (construction)
- Stone (crushed)

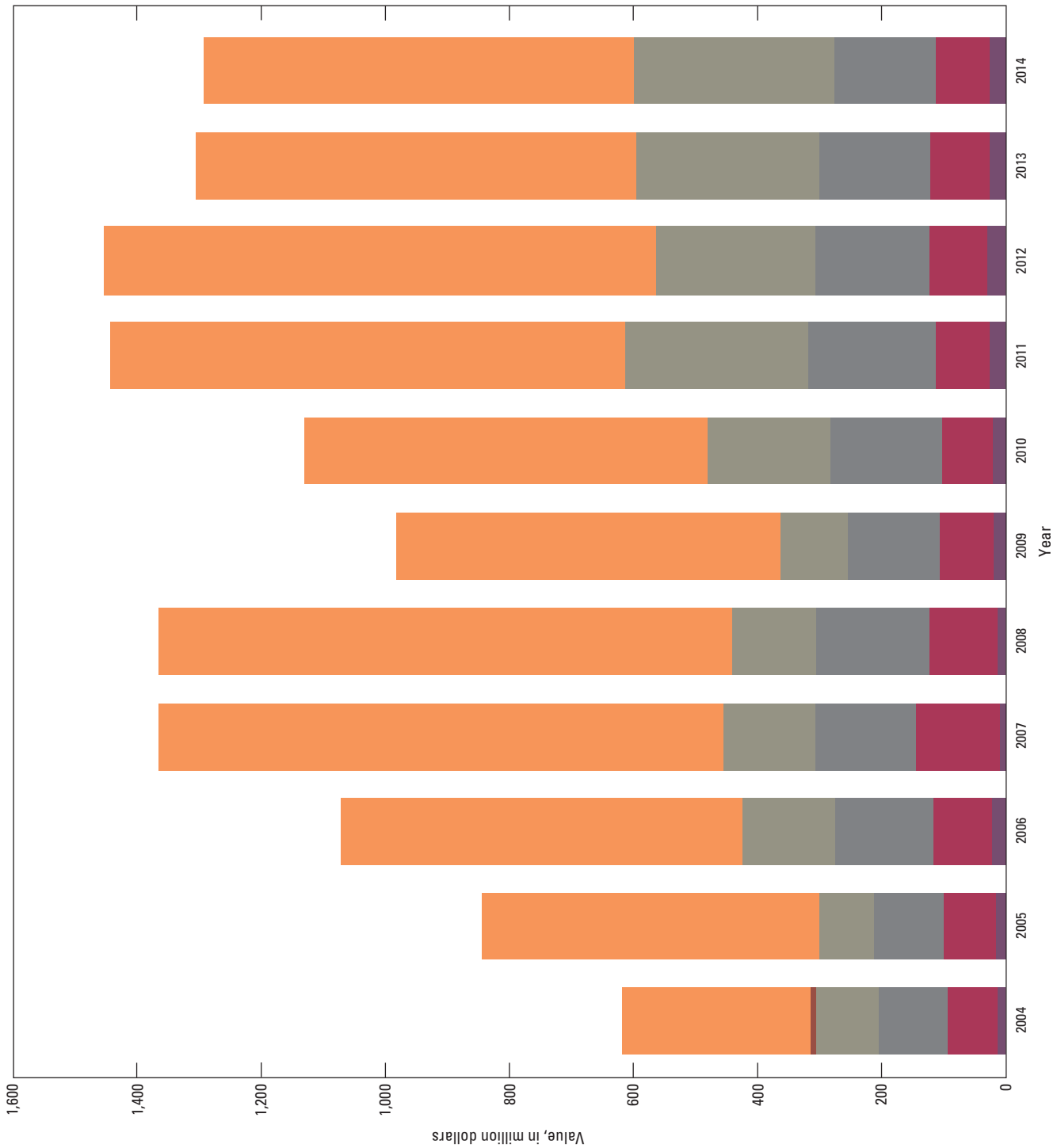


Figure 2. The production value of nonfuel mineral commodities from 2004 through 2014 in Montana. Values less than \$5 million are not shown. "Other" includes the "Combined values" data listed in table 1. For a complete list of nonfuel mineral commodities and production values for all States, please refer to the Statistical Summary chapter (tables 5, 6).