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March 15, 2019

Testimony in support of House Bill 4227 to create the Committee on Michigan's Mining Future

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The Lake Superior Community Partnership (LSCP) is a private-public partnership in Marquette County, Michigan whose mission is focused on the promotion and advancement of economic and community development. We are an Accredited Economic Development Organization through the International Economic Development Council (IEDC) and serve as Marquette County's leading resource for economic development. Our partner businesses, 400 strong, are committed to this mission through the investment of time, talent and resources.

Mining has been a critical industry to the Upper Peninsula and the State of Michigan for over 175 years. Therefore, it is important that we work together to strengthen and develop sustainable mining practices for the future. HB 4227, the creation of the Committee of Michigan's Mining Future, is the catalyst for this to happen.

We are currently working on the potential reopening of the Empire Mine in Marquette County. Think of this as our Amazon, our Foxconn, or our "Big Three" in terms of impact to the region:

- Approximately 355 new jobs created
- Over \$62 million annually in direct jobs wages/benefits
- Estimated \$2-3 million in Specific Ore revenue
- Approximately 100 outside contractors and vendors during the reconstruction phase
- Annual economic impact estimate of \$200 million
- Estimated mine life of 20 years

I am sure you can understand how an economic impact such as this can change the lives of many while enhancing the region.

We urge you to support HB 4227. Ensuring the development of a comprehensive plan focused on mining industry needs, via a committee made up of a diverse group of stakeholders, will result in our ability to meet challenges and take advantage of opportunities for a strong mining future in Michigan.

Sincerely,

A handwritten signature in black ink that reads "Amy Clickner".

Amy Clickner
Chief Executive Officer
Lake Superior Community Partnership

Testimony in support of House Bill 4227 to create the Committee on Michigan's Mining Future

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Michigan is a major mining state. As of 2013, the value of nonfuel minerals produced in Michigan was \$2.59 billion, ranking it 9th in the nation for mining activity[1]. This not only represents significant economic activity in its own right, it also provides crucial raw materials and feedstocks for the metals, chemicals, and construction industries in the state.

An important consideration in mining of natural resources is that they are natural materials. That is, they vary greatly in their purity and physical characteristics. In their as-mined states, very few ores are immediately usable. Physical and chemical processing is needed to convert them into the pure metals and chemicals that are actually needed. Because of the variability of the natural ores, every mine is unique in its processing approach, and so starting a new mine includes a long period of study to characterize the ore, experiment with processing techniques, and design the processing facility before any mining activity can begin. It is also necessary to fully take environmental concerns into account so that the mining activity can be carried out without harm.

The industry benefits from support for early-stage research to determine the viability of new mining projects. For example, the iron ore concentration process used at the Tilden mine was originally developed in the U. S. Bureau of Mines research laboratories. However, while the Bureau of Mines was formerly a major source of advanced mineral processing methods, it was closed by the federal government and most of its research functions eliminated in 1996. Since then, there has been virtually no support for non-fuels minerals extraction research at the Federal level. Any support for such activities therefore falls to the states. If the state does not collaborate with industry to identify promising mineral projects and assist in developing the necessary extraction technologies, it simply will not happen. As a result, the mining industry will move to states which do provide such collaboration.

A combination of collaboration and unambiguous regulations is essential for maintaining and improving the mining industry in Michigan. The long lead times to develop a new mining venture make it very beneficial to the industry to have a stable regulatory environment, and so long-term planning of state policies is of great value.

As of 2015, the top ten states in value of nonfuel mineral production[2] were Nevada, Arizona, Texas, Minnesota, California, Alaska, Florida, Michigan, Missouri, and Wyoming. At least four of these top ranked states (Nevada, Texas, Minnesota, and Florida) formally provide direct research support for development of mineral processing and extraction technologies [3-6], and other states have more informal programs. I have been directly involved in research projects related to mineral processing and

extraction supported by Minnesota, Ohio, Illinois, and Florida, these projects are typically done in direct collaboration with industry to benefit their respective states.

References

- [1] USGS (2016) "Michigan", 2012-2013 Minerals Yearbook, U. S. Geological Survey, Department of the Interior
- [2] USGS (2015) "Statistical Summary", 2015 Minerals Yearbook, U. S. Geological Survey, Department of the Interior
- [3] Nevada Bureau of Mines and Geology – Research <http://www.nbmj.unr.edu/Research/index.html>
- [4] Texas Bureau of Economic Geology – Research Facilities <http://www.beg.utexas.edu/about/facilities>
- [5] Minnesota Department of Natural Resources Division of Lands and Minerals https://www.dnr.state.mn.us/lands_minerals/index.html
- [6] Florida Industrial and Phosphate Research Institute <http://www.fipr.state.fl.us/research/>



2012–2013 Minerals Yearbook

MICHIGAN [ADVANCE RELEASE]

MICHIGAN

KEWEENAW



LEGEND

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

MINERAL SYMBOLS (Principal producing areas)

- Cem Cement plant
- Clay Common clay
- CS Crushed stone
- Cu Copper plant
- D-Sd Dimension sandstone
- FA Ferroalloys
- Fe Iron ore
- Gyp Gypsum
- IS Industrial sand
- K Potash
- Lime Lime plant
- Lime-c Lime plant (captive)
- MgCp Magnesium compounds
- Peat Peat
- Per Perlite plant
- S-ng Sulfur (natural gas)
- Salt Salt
- SG Construction sand and gravel
- Steel Steel plant
- TiMet Titanium metal plant
- Concentration of mineral operations

0 50 100 Kilometers

Albers equal area projection

THE MINERAL INDUSTRY OF MICHIGAN

This chapter has been prepared under a Memorandum of Understanding between the U.S. Geological Survey and the Michigan Office of Oil, Gas and Minerals for collecting information on all nonfuel minerals.

In 2013, the value of the nonfuel mineral production¹ in the State of Michigan increased to \$2.59 billion, 3.4% of the total U.S. nonfuel mineral production (excluding steel), ranking it ninth in the country. In 2012, the corresponding value was \$2.13 billion, 2.8% of the Nation's total nonfuel mineral production, ranking it 11th among the 50 States. In 2013, on a per capita basis, nonfuel mineral production in Michigan had a value of \$262 compared with the national average of \$238. In 2012, the per capita value was \$216 compared with the national average of \$241.

The value of nonfuel mineral production in Michigan for the years 2006 through 2013 was as follows (in billions of dollars): \$1.94 (2006), \$1.97 (2007), \$2.02 (2008), \$1.76 (2009), \$2.17 (2010), \$2.45 (2011), \$2.13 (2012), and \$2.59 (2013).

In 2013, there were 2,105 employees in nonfuel mineral mines in Michigan and 1,239 in mills and preparation plants. In 2012, the corresponding numbers were 2,163 in nonfuel mineral mines and 1,257 in mills and preparation plants (U.S. Mine Safety and Health Administration, 2013, p. 11; 2014, p. 11). In 2013, the average annual wage in Michigan for all mining was \$78,880 compared with \$46,673 for all industries. In 2012, the corresponding figures were \$78,831 and \$46,223, respectively (National Mining Association, unpub. data, February 4, 2016).

In 2013 and 2012, on the basis of production quantity, Michigan was the leading State for the production of magnesium compounds out of 4 producing States, ranked second in the production of iron ore (shipped) out of 3 producing States, ranked third in the production of potash out of 3 producing States, and ranked fifth in the production of construction sand and gravel out of 50 producing States. In 2013, Michigan moved up from fifth in 2012 to fourth in the sales of peat out of 13 and 12 producing States, respectively. The State moved down to fifth in 2013 from fourth in 2012 in the production of portland cement out of 34 and 35 producing States, respectively.

In 2012 and 2013, the State also produced common clays, crushed stone, dimension stone, gypsum, industrial sand and gravel, lime, masonry cement, natural gemstones, and salt (table 1). Although not listed in table 1, Michigan also produced pig iron and (or) crude steel at Dearborn, Ecorse, Jackson, and Monroe.

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. Excludes steel and other smelted or refined metals.

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>.

Commodity Review

The following information has been extracted from U.S. Geological Survey (USGS) and other sources. Data from other sources may differ from USGS data, which are based on company responses to USGS surveys and estimation for nonrespondents. The USGS withheld some data to avoid disclosing company proprietary data.

Metals

Mineral industry activity with respect to metals was as follows:

There were only two active iron ore mines in Michigan in 2012–13, the Empire Mine and the Tilden Mine (Cliffs Natural Resources, Inc, Cleveland, Ohio). These were open pit mines located in Marquette County, producing iron ore for pellets for the steel industry. The Empire Mine was temporarily shut down in 2013 and slated for closure in 2014 (Tuck, 2015, p. 39.2).

Higher grade ores, with iron concentrations greater than 50%, have long been exhausted. Lean ores (25% to 30% iron) require beneficiating to reduce the silica components to control shipping and smelting costs. Taconite and jaspillite are the two most common lean ores currently mined and beneficiated.

In 2013, the U.S. Environmental Protection Agency issued a Federal implementation plan for one taconite facility in Michigan that required the installation and operation of continuous air monitoring systems and set nitrogen oxide (NO_x) emission limits based on the best available retrofit technology. The final rule went into effect in 2014 (Tuck, 2015, p. 39.1).

Significant quantities of copper were mined in Michigan's Upper Peninsula during the second half of the 19th century and first half of the 20th century. Production, however, began to decline in the 1980s and eventually ceased in 1995. In 2002, Kennecott Exploration (a subsidiary of the London-based Rio Tinto Group) discovered a high-grade nickel-copper deposit near Marquette and began permitting and construction of the Eagle Mine and Humboldt mill. In February 2013, Rio Tinto changed focus and slowed construction of these facilities. In July 2013, Rio Tinto sold the ongoing mining project to Lundin Mining Corp. (Toronto, Ontario, Canada), which included the 80%-finished underground Eagle Mine west of Big Bay and the unfinished Humboldt mill 40 km southwest of Marquette for \$318 million cash (Lundin Mining Corp., 2014). The mine was expected to be completed by late 2014 and begin production in the first quarter of 2015, reaching full production in mid-2015 (Kuck, 2016, p. 56.2).

Industrial Minerals

Mineral industry activity with respect to industrial minerals was as follows:

The area around Detroit has underground room-and-pillar mines that produce coarse rock salt for deicing purposes and other industrial uses. Solution mining of the salt is common deeper in the basin and is a basic raw material for several industries. The Salinas salt was obtained by solution mining operations, which also produced bromine, magnesium, and potassium for industrial chemicals, fertilizers, and food-grade salt.

Gypsum was mined in underground room-and-pillar mines near Grand Rapids and in open pit mines in the vicinity of the town of Alabaster near Lake Huron.

Michigan's crushed stone production was mainly limestone and dolomite for concrete aggregate, controlling shoreline erosion, industrial products, and pharmaceuticals. Most of the quarries are located near the Great Lakes shoreline owing to their shallow depth and ease of shipping. In 2013, there were 37 active crushed stone operations in the State with 36 quarries and 29 processing plants. In 2012, there were 38 active operations with 33 quarries and 27 processing plants.

Thick deposits of Pleistocene glacial sediments overlay much of the surface of Michigan, so unconsolidated layers of clay, gravel, and sand are mined locally. Much of the mined material is used for industrial purposes (such as foundry sand, glass, traction, and so forth) and construction. Many concrete plants are located at or near these gravel pits. In 2013, there were 323 active construction sand and gravel operations in Michigan, of

which 19 were dredging operations. In 2012, the corresponding numbers were 333 active operations and 16 dredging operations.

References Cited

- Gillespie, R., Harrison, W.B., III, and Grammer, G.M., 2008, *Geology of Michigan and the Great Lakes: Kalamazoo, MI*, Michigan Geological Repository for Research and Education, Western Michigan University, 37 p.
- Kuck, P.H., 2016, Nickel [advance release], in *Metals and minerals: U.S. Geological Survey Minerals Yearbook 2013*, v. 1, p. 51.1–51.31. (Accessed June 28, 2016, at <http://minerals.usgs.gov/minerals/pubs/commodity/nickel/myb1-2013-nicke.pdf>.)
- Lundin Mining Corp., 2014, Eagle Mine site visit—May 15–16, 2014: Toronto, Ontario, Canada, Lundin Mining Corp., December, 52 p. (Accessed June 27, 2016, at http://www.lundinmining.com/i/pdf/2014-05-15_ems_v_4arp4m.pdf.)
- Tuck, C.A., 2015, Iron ore [advance release], in *Metals and minerals: U.S. Geological Survey Minerals Yearbook 2013*, v. 1, p. 39.1–39.19. (Accessed May 26, 2016, at http://minerals.usgs.gov/minerals/pubs/commodity/iron_ore/myb1-2013-feore.pdf.)
- U.S. Mine Safety and Health Administration, [2013], *Mine injury and worktime, quarterly, January–December 2012*, Final, closeout edition, 33 p. (Accessed February 4, 2016, at http://arlweb.msha.gov/Stats/Part50/WQ/MasterFiles/MIWQ%20Master_20125.pdf.)
- U.S. Mine Safety and Health Administration, [2014], *Mine injury and worktime, quarterly, January–December 2013*, Final, closeout edition, 34 p. (Accessed February 4, 2016, at http://arlweb.msha.gov/Stats/Part50/WQ/MasterFiles/MIWQ%20Master_20135.pdf.)
- Walton, Nicole, 2014, Empire Mine saved from closing in 2014: Marquette, MI, WNMU (Northern Michigan University Public Radio), February 27. (Accessed May 26, 2016, at <http://wnmufm.org/post/empire-mine-saved-closing-2014#stream/0>.)

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN MICHIGAN^{1,2}

(Thousand metric tons and thousand dollars)

| Mineral | 2011 | | 2012 | | 2013 | |
|--|---------------------|------------------------|---------------------|----------------------|---------------------|----------------------|
| | Quantity | Value | Quantity | Value | Quantity | Value |
| Cement: | | | | | | |
| Masonry | 61 | 8,300 ^e | 73 | 9,540 ^e | 61 | 8,500 ^e |
| Portland | 3,480 | 353,000 ^e | 3,890 | 346,000 ^e | 3,860 | 370,000 ^e |
| Clays, common | 312 | 1,280 | W | W | W | W |
| Gemstones, natural | NA | 2 | NA | 2 | NA | 2 |
| Gypsum, crude | 345 | 2,670 | 322 | 2,250 | 368 | 3,040 |
| Iron ore, usable shipped | 13,200 | W | 10,800 ^e | W | 10,500 ^e | W |
| Lime | 518 | 56,500 | 526 | 62,300 | 524 | 64,700 |
| Peat | 3 | 27 | W | W | W | W |
| Sand and gravel: | | | | | | |
| Construction | 32,100 ^r | 179,000 ^r | 31,600 | 173,000 | 34,300 | 197,000 |
| Industrial | 1,830 | 67,500 | 1,450 | 59,100 | 1,230 | 49,000 |
| Stone, crushed | 22,700 ^r | 137,000 ^r | 24,900 ^r | 168,000 ^r | 26,700 | 193,000 |
| Combined values of magnesium compounds, potash, salt stone (dimension), and values indicated by symbol W | XX | 1,650,000 | XX | 1,310,000 | XX | 1,710,000 |
| Total | XX | 2,450,000 ^r | XX | 2,130,000 | XX | 2,590,000 |

^eEstimated. ^rRevised. NA Not available. W Withheld to avoid disclosing company proprietary data; included in "Combined values" data. 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
MICHIGAN: 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 | 29 | 24,300 | \$165,000 | \$6.79 | 30 | 25,800 | \$187,000 | \$7.26 |
| Dolomite | (3) | (3) | (3) | (3) | (3) | (3) | (3) | (3) |
| Calcareous marl | (4) | (4) | (4) | (4) | (4) | (4) | (4) | (4) |
| Traprock | (4) | (4) | (4) | (4) | (4) | (4) | (4) | (4) |
| Miscellaneous stone | 5 | 618 | 3,610 | 5.84 | 6 | 857 | 5,180 | 6.04 |
| Total or average | XX | 24,900 | 168,000 | 6.77 | XX | 26,700 | 193,000 | 7.22 |

XX Not applicable. -- Zero.

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 "Limestone."

⁴Withheld to avoid disclosing company proprietary data; included with "Miscellaneous stone."

TABLE 3
MICHIGAN: 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): | | | | | | |
| Macadam | 22 | \$383 | \$17.43 | W | W | W |
| Riprap and jetty stone | 89 | 1,440 | 16.22 | 77 | \$1,150 | \$15.03 |
| Filter stone | 16 | 172 | 10.76 | W | W | W |
| Unspecified coarse aggregate | -- | -- | -- | W | W | W |
| Coarse aggregate, graded: | | | | | | |
| Concrete aggregate, coarse | 2,240 | 20,100 | 8.96 | 540 | 5,430 | 10.04 |
| Bituminous aggregate, coarse | 193 | 2,080 | 10.75 | 17 | 122 | 7.09 |
| Railroad ballast | W | W | W | W | W | W |
| Unspecified graded coarse aggregate | -- | -- | -- | W | W | W |
| Fine aggregate (-¾ inch): | | | | | | |
| Stone sand, concrete | W | W | W | 9 | 43 | 4.96 |
| Stone sand, bituminous mix or seal | 164 | 1,100 | 6.71 | W | W | W |
| Screening, undesignated | 280 | 1,770 | 6.31 | 163 | 1,740 | 10.69 |
| Unspecified fine aggregate | -- | -- | -- | W | W | W |
| Coarse and fine aggregates: | | | | | | |
| Graded road base or subbase | 2,510 | 16,000 | 6.35 | 903 | 5,970 | 6.60 |
| Unpaved road surface | 1 | 8 | 8.15 | 167 | 2,010 | 12.06 |
| Terrazzo and exposed aggregate | W | W | W | -- | -- | -- |
| Crusher run or fill or waste | W | W | W | 14 | 98 | 7.02 |
| Unspecified coarse and fine aggregates | 10 | 79 | 7.91 | 1,130 | 9,850 | 8.71 |
| Agricultural: | | | | | | |
| Agricultural Limestone | 287 | 4,040 | 14.06 | 550 | 9,070 | 16.48 |
| Poultry grit and mineral food | -- | -- | -- | W | W | W |
| Unspecified and other agricultural uses | 58 | 220 | 3.80 | 90 | 339 | 3.76 |
| Chemical and metallurgical: | | | | | | |
| Cement manufacture | 4,310 | 11,300 | 2.63 | W | W | W |
| Lime manufacture | W | W | W | W | W | W |
| Flux stone | 218 | 1,440 | 6.61 | W | W | W |
| Sulfur oxide removal | W | W | W | W | W | W |
| Special: | | | | | | |
| Whiting or whiting substitute | -- | -- | -- | W | W | W |
| Other fillers or extenders | W | W | W | -- | -- | -- |
| Other miscellaneous uses and specified uses not listed | | | | | | |
| Unspecified: ² | | | | | | |
| Reported | 836 | 3,540 | 4.23 | 4,350 | 34,100 | 7.84 |
| Estimated | 10,200 | 68,600 | 6.72 | 3,510 | 23,200 | 6.61 |
| Total or average | 24,900 | 168,000 | 6.77 | 26,700 | 193,000 | 7.22 |

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
MICHIGAN: 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 | 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 | -- | -- | -- | -- | -- | -- |
| Agricultural ⁶ | 1 | 36 | W | W | W | W |
| Chemical and metallurgical ⁷ | W | W | W | W | -- | -- |
| Special ⁸ | -- | -- | W | W | -- | -- |
| Other miscellaneous uses and specified uses not listed | -- | -- | -- | -- | -- | -- |
| Unspecified: ⁹ | | | | | | |
| Reported | -- | -- | -- | -- | 836 | 3,540 |
| Estimated | 6,260 | 47,100 | 1,430 | 7,550 | 2,540 | 14,000 |
| Total | 7,770 | 57,500 | 10,300 | 64,100 | 6,790 | 46,900 |

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 macadam, riprap and jetty stone, and filter stone.

³Includes concrete aggregate (coarse), bituminous aggregate (coarse), and railroad ballast.

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

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

⁶Includes agricultural limestone and other agricultural uses.

⁷Includes cement manufacture, lime manufacture, flux stone, and sulfur oxide removal.

⁸Includes other fillers or extenders.

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

TABLE 5
MICHIGAN: 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 | 188 | 727 | 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 | 1,110 | 8,910 | 1,020 | 8,370 | W | W |
| Other construction materials | -- | -- | -- | -- | -- | -- |
| Agricultural ⁶ | W | W | W | W | W | W |
| Chemical and metallurgical ⁷ | W | W | W | W | -- | -- |
| Special ⁸ | -- | -- | W | W | -- | -- |
| Other miscellaneous uses and specified uses not listed | -- | -- | -- | -- | -- | -- |
| Unspecified: ⁹ | | | | | | |
| Reported | (10) | (10) | -- | -- | 4,350 | 34,100 |
| Estimated | -- | -- | 1,320 | 8,730 | 2,190 | 14,500 |
| Total | 8,340 | 72,100 | 11,400 | 69,400 | 6,920 | 51,100 |

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 macadam, riprap and jetty stone, and filter stone.

³Includes concrete aggregate (coarse), bituminous aggregate (coarse), and railroad ballast.

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

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

⁶Includes agricultural limestone and other agricultural uses.

⁷Includes cement manufacture, lime manufacture, flux stone, and sulfur oxide removal.

⁸Includes other fillers or extenders.

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

¹⁰Less than ½ unit.

TABLE 6
MICHIGAN: 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) | 3,120 | \$18,700 | \$5.99 |
| Plaster and gunit sands | 129 | 482 | 3.74 |
| Concrete products (blocks, bricks, pipe, decorative, and so forth) | 4 | 38 | 9.50 |
| Asphaltic concrete aggregates and other bituminous mixtures | 2,080 | 14,300 | 6.88 |
| Road base and coverings | 5,260 | 28,900 | 5.49 |
| Road and other stabilization (cement) | 51 | 341 | 6.69 |
| Road and other stabilization (lime) | 194 | 1,680 | 8.66 |
| Fill | 2,180 | 6,420 | 2.94 |
| Snow and ice control | 171 | 684 | 4.00 |
| Railroad ballast | 30 | 265 | 8.83 |
| Other miscellaneous uses ² | 333 | 2,220 | 6.67 |
| Unspecified: ³ | | | |
| Reported | 4,170 | 24,700 | 5.92 |
| Estimated | 13,900 | 74,900 | 5.39 |
| Total or average | 31,600 | 173,000 | 5.47 |

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

²Includes filtration.

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

TABLE 7
MICHIGAN: 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) | 1,910 | \$12,500 | \$6.54 |
| Plaster and gunit sands | 63 | 178 | 2.83 |
| Concrete products (blocks, bricks, pipe, decorative, and so forth) | 55 | 372 | 6.76 |
| Asphaltic concrete aggregates and other bituminous mixtures | 1,510 | 9,310 | 6.18 |
| Road base and coverings | 3,780 | 17,500 | 4.62 |
| Road and other stabilization (cement) | 28 | 171 | 6.11 |
| Road and other stabilization (lime) | 182 | 1,930 | 10.62 |
| Fill | 2,580 | 7,090 | 2.75 |
| Snow and ice control | 220 | 823 | 3.74 |
| Railroad ballast | 22 | 250 | 11.36 |
| Other miscellaneous uses ² | 137 | 1,190 | 8.68 |
| Unspecified: ³ | | | |
| Reported | 5,250 | 31,200 | 5.95 |
| Estimated | 18,600 | 115,000 | 6.16 |
| Total or average | 34,300 | 197,000 | 5.74 |

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

²Includes filtration.

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

TABLE 8
MICHIGAN: 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 (including concrete sand) | 280 | 2,150 | 375 | 1,970 | 2,470 | 14,600 |
| Concrete products (blocks, bricks, pipe, decorative, and so forth) ² | 5 | 46 | 1 | 6 | 127 | 468 |
| Asphaltic concrete aggregates and other bituminous mixtures | 351 | 2,420 | 209 | 1,420 | 1,530 | 10,400 |
| Road base and coverings | 2,170 | 11,800 | 853 | 4,260 | 2,230 | 12,800 |
| Road and other stabilization (cement and lime) | 27 | 180 | 49 | 293 | 169 | 1,550 |
| Fill | 72 | 256 | 143 | 317 | 1,960 | 5,850 |
| Other miscellaneous uses ³ | 65 | 391 | 142 | 676 | 328 | 2,110 |
| Unspecified: ⁴ | | | | | | |
| Reported | 15 | 181 | 64 | 397 | 4,090 | 24,100 |
| Estimated | 559 | 3,120 | 3,110 | 17,300 | 10,300 | 54,400 |
| Total | 3,550 | 20,500 | 4,940 | 26,700 | 23,200 | 126,000 |

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

²Includes plaster and gunite sands.

³Includes filtration, railroad ballast, and snow and ice control.

⁴Reported and estimated production without a breakdown by end use.

TABLE 9
MICHIGAN: 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 (including concrete sand) | 241 | 2,860 | 342 | 2,020 | 1,330 | 7,610 |
| Concrete products (blocks, bricks, pipe, decorative, and so forth) ² | 9 | 129 | 1 | 6 | 108 | 415 |
| Asphaltic concrete aggregates and other bituminous mixtures | 112 | 693 | 283 | 2,000 | 1,110 | 6,620 |
| Road base and coverings | 1,480 | 5,930 | 847 | 3,230 | 1,450 | 8,310 |
| Road and other stabilization (cement and lime) | -- | -- | 7 | 28 | 203 | 2,080 |
| Fill | 86 | 237 | 146 | 405 | 2,350 | 6,450 |
| Other miscellaneous uses ³ | 63 | 482 | 98 | 497 | 219 | 1,280 |
| Unspecified: ⁴ | | | | | | |
| Reported | 53 | 140 | 5 | 60 | 5,190 | 31,000 |
| Estimated | 798 | 5,150 | 4,660 | 29,300 | 13,100 | 80,100 |
| Total | 2,850 | 15,600 | 6,390 | 37,500 | 25,100 | 144,000 |

-- Zero.

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

²Includes plaster and gunite sands.

³Includes filtration, railroad ballast, and snow and ice control.

⁴Reported and estimated production without a breakdown by end use.



2015 Minerals Yearbook

STATISTICAL SUMMARY [ADVANCE RELEASE]

STATISTICAL SUMMARY

By Joseph M. Krisanda

The world production table was prepared by Glenn J. Wallace, international data coordinator.

This annual report summarizes data on nonfuel mineral production for the United States and the Commonwealth of Puerto Rico.

Although nonfuel mineral production¹ may be measured at any stage of extraction and processing, the stage of measurement used most commonly in this annual report is what is termed “mine output.” This term refers to minerals or ores in the form in which they are first extracted from the ground, but customarily may include the output from auxiliary processing at or near the mines. Mine output as measured as sold or used by producers in a given year is primarily shown in the tables, because values can be assigned. Where sold or used is not available, actual mine output is used as the production

measurement and value is estimated on the basis of the average price of the mineral commodity for that year.

For copper, gold, lead, palladium, platinum, silver, and zinc, the quantities listed are recorded on a mine basis (as the recoverable content of ore sold or treated). The values assigned to the quantities, however, are based on the average selling price of refined metal, not the value of the mined material.

The total value of all nonfuel mineral production in the United States in 2015 decreased by 7.3% to \$72.7 billion compared with \$78.5 billion for 2014; metals decreased by 15.5% to \$24.4 billion, and industrial minerals decreased by 2.5% to \$48.3 billion (table 1).

In 2015, 12 mineral commodities had production values greater than \$1 billion. They were, in descending order of value, crushed stone, portland cement, gold, copper, construction sand and gravel, industrial sand and gravel, iron ore, salt, lime, marketable phosphate rock, soda ash, and zinc. The production of these mineral commodities accounted for 88.5% of the U.S. total production value (table 1).

In 2015, the top 10 States, in descending order of value of nonfuel mineral production, were Nevada, Arizona, Texas, Minnesota, California, Alaska, Florida, Michigan, Missouri, and Wyoming. The mineral production of these States accounted for 54.4% of the U.S. total production value (table 3).

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 2015 U.S. Geological Survey (USGS) mineral production data published in this chapter are as of June 2018. 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. Specialist contact information is available at <https://minerals.usgs.gov/minerals/contacts/comdir.html>; alternatively, specialists' names and telephone numbers may be obtained by calling USGS information at (703) 648-4000 or by calling the USGS Earth Science Information Center at 1-888-ASK-USGS (275-8747). Minerals Yearbook chapters (for mineral commodities, States, and countries) and Mineral Industry Surveys are also available on the internet at <https://minerals.usgs.gov/minerals>.

TABLE 1
NONFUEL MINERAL PRODUCTION IN THE UNITED STATES^{1,2,3}

(Thousand metric tons and thousand dollars unless otherwise specified)

| Commodity | 2013 | | 2014 | | 2015 | | |
|--|----------------------|------------------------|-------------------------|-----------------------|-------------------------|-----------------------|------------------------|
| | Quantity | Value | Quantity | Value | Quantity | Value | |
| Metals: | | | | | | | |
| Beryllium ⁴ | metric tons | 235 | W | 270 | W | 205 | W |
| Cobalt ^{e,5} | do. | -- | -- | 120 | W | 760 | W |
| Copper ⁶ | | 1,250 | 9,360,000 | 1,360 | 9,510,000 | 1,380 | 7,810,000 |
| Gold ⁶ | kilograms | 230,000 | 10,400,000 | 210,000 | 8,570,000 | 214,000 | 8,000,000 |
| Iron ore ⁷ | | 52,800 | 4,610,000 | 56,100 | 4,730,000 | 46,100 | 3,750,000 |
| Lead ⁶ | metric tons | 331,000 | 837,000 | 367,000 ^r | 860,000 | 360,000 | 724,000 |
| Molybdenum concentrates ⁶ | do. | 61,000 | 1,320,000 ^r | 68,200 | 1,610,000 ^r | 47,400 | 700,000 |
| Nickel ⁸ | do. | -- | -- | 4,300 | W | 27,200 | W |
| Palladium ⁶ | kilograms | 12,600 | 295,000 | 12,400 | 324,000 | 12,500 | 280,000 |
| Platinum ⁶ | do. | 3,720 | 178,000 | 3,660 | 163,000 | 3,670 | 125,000 |
| Rare earths ^{e,9} | metric tons | 5,500 | W | 5,400 | W | 5,900 | W |
| Rhenium ¹⁰ | kilograms | 7,110 | NA | 8,510 | NA | 7,900 | NA |
| Silver ⁶ | do. | 1,050,000 ^r | 801,000 ^r | 1,180,000 | 737,000 | 1,090,000 | 551,000 |
| Vanadium ⁶ | metric tons | 591 | 7,870 | -- | -- | -- | -- |
| Zinc ⁶ | do. | 758,000 | 1,600,000 | 803,000 | 1,900,000 | 797,000 | 1,680,000 |
| Zirconium mineral concentrates, zircon | do. | (11) | W | (11) | W | 80,000 ¹² | W |
| Combined values of cadmium, magnesium metal, titanium mineral concentrates, tungsten, and values indicated by symbol W | | XX | 456,000 | XX | 496,000 | XX | 802,000 |
| Total | | XX | 29,900,000 ^r | XX | 28,900,000 ^r | XX | 24,400,000 |
| Industrial minerals, excluding fuels:¹³ | | | | | | | |
| Barite | | 723 | 81,857 ^e | 663 | 88,602 ^e | 425 | 56,337 ^e |
| Cement: ⁷ | | | | | | | |
| Masonry | | 2,116 | 303,000 ^e | 2,220 ^r | 323,000 ^{r,e} | 2,311 | 350,000 ^e |
| Portland | | 74,689 | 6,980,000 ^e | 80,315 | 7,980,000 ^e | 82,094 | 8,640,000 ^e |
| Clay: | | | | | | | |
| Ball | | 1,000 | 42,800 | 1,030 | 45,200 | 1,030 | 47,500 |
| Bentonite | | 4,350 | 282,000 | 4,800 | 323,000 ^r | 4,040 | 298,000 |
| Common | | 11,000 | 128,000 | 11,400 ^r | 126,000 ^r | 12,200 | 164,000 |
| Fire | | 194 | 3,460 | 222 | 3,880 | 225 | 3,190 |
| Fuller's earth, montmorillonite | | 1,990 | 175,000 | 1,980 | 169,000 | 1,930 | 205,000 |
| Kaolin | | 6,140 | 896,000 | 6,250 | 901,000 | 5,990 | 776,000 |
| Diatomite | | 782 | 229,000 | 901 | 269,000 | 832 | 242,000 |
| Feldspar ^{e,7} | metric tons | 550,000 ¹⁴ | 40,100 | 530,000 ¹⁴ | 34,800 | 520,000 ¹⁴ | 38,200 |
| Garnet, industrial ^{7,15} | do. | 51,600 | 7,500 | 44,200 | 6,540 | 55,600 | 8,450 |
| Gemstones, natural ^{e,7} | | NA | 9,570 | NA | 9,490 | NA | 8,540 |
| Gypsum, crude ⁷ | | 14,400 ^r | 128,000 ^r | 14,900 ^r | 132,000 ^r | 15,200 | 135,000 |
| Helium: | | | | | | | |
| Crude | million cubic meters | 28 | 85,100 | 27 | 93,100 | 25 | 85,900 |
| Grade-A | do. | 118 | 807,000 | 102 | 904,000 | 91 | 648,000 |
| Kyanite ¹⁶ | metric tons | 110,000 ^r | 38,000 ^{r,e} | 89,000 ^r | 29,000 ^{r,e} | 108,000 | 37,000 ^e |
| Lime ¹⁷ | | 19,200 | 2,320,000 | 19,500 | 2,390,000 ^r | 18,300 | 2,290,000 |
| Lithium carbonate | metric tons | 870 ¹⁸ | 11,200 | (11) | W | (11) | W |
| Mica, crude | do. | 48,100 | 5,940 | 48,200 ^r | 5,640 ^r | 32,600 | 4,640 |
| Peat | do. | 453,000 | 11,500 | 479,000 | 12,000 | 458,000 | 13,000 |
| Perlite, crude | do. | 419,000 | 23,100 | 462,000 ^r | 25,500 ^r | 459,000 | 27,900 |
| Phosphate rock, marketable ⁷ | | 31,200 | 2,850,000 | 25,300 | 1,990,000 | 27,400 | 1,980,000 |
| Potash ¹⁴ | | 2,000 | 630,000 | 2,000 | 680,000 | 1,500 | 550,000 |
| Pumice and pumicite | metric tons | 269,000 | 9,320 | 269,000 ^r | 10,400 ^r | 310,000 | 10,100 |
| Salt | | 43,100 | 1,980,000 | 46,000 | 2,180,000 ^r | 42,800 | 2,290,000 |

See footnotes at end of table.

TABLE 1—Continued
NONFUEL MINERAL PRODUCTION IN THE UNITED STATES^{1,2,3}

(Thousand metric tons and thousand dollars unless otherwise specified)

| Commodity | 2013 | | 2014 | | 2015 | |
|---|----------------------|------------------------|-------------------------|------------------------|-------------------------|--------------------|
| | Quantity | Value | Quantity | Value | Quantity | Value |
| Industrial minerals, excluding fuels: ¹³ —Continued | | | | | | |
| Sand and gravel: | | | | | | |
| Construction | 824,000 ^r | 6,400,000 ^r | 831,000 ^r | 6,670,000 ^r | 885,000 | 7,280,000 |
| Industrial | 62,100 | 3,470,000 | 110,000 | 8,240,000 ^r | 103,000 | 4,850,000 |
| Silica stone, special | metric tons | 146 | 36 | 146 ^e | 36 ^e | 205 |
| Soda ash ⁷ | | 11,500 | 1,660,000 ^r | 11,700 | 1,730,000 ^r | 11,600 |
| Stone: | | | | | | |
| Crushed ¹⁹ | | 1,200,000 ^r | 11,900,000 ^r | 1,250,000 | 12,800,000 ^r | 1,330,000 |
| Dimension | | 2,280 | 459,000 | 2,470 | 470,000 | 2,630 ^e |
| Talc, crude ⁷ | metric tons | 542,000 | 20,800 | 608,000 ^r | 16,700 ^{r,e} | 687,000 |
| Silica, tripoli ⁷ | do. | 110,000 | 17,600 | 93,100 | 19,500 | 70,500 |
| Vermiculite, concentrates ⁶ | | 100 ²⁰ | W | 100 ²⁰ | W | 100 ²⁰ |
| Zeolites ⁷ | metric tons | 69,500 | W | 62,800 ^r | W | 75,100 |
| Combined values of andalusite, bauxite, ²¹ boron minerals, bromine, clay (fuller's earth, attapulgite), emery (2013–14), iodine (crude), iron oxide pigments (crude), magnesite, magnesium compounds, pyrophyllite (crude), staurolite, wollastonite, and values indicated by symbol W | | XX | 1,150,000 | XX | 899,000 ^r | XX |
| Total | | XX | 43,100,000 ^r | XX | 49,600,000 ^r | XX |
| Grand total | | XX | 73,100,000 ^r | XX | 78,500,000 ^r | XX |

⁶Estimated. ^rRevised. do. Ditto. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined values." XX Not applicable. -- Zero.

¹Summary data from the commodity chapters published in the Minerals Yearbook as they were completed and released through June 2018.

²Production as measured by mine output, mine shipments, sales, or marketable production (including consumption by producers). Gross weight unless otherwise specified. Mine output as measured as sold or used by producers in a given year is primarily shown in the tables, because values can be assigned. Where sold or used data are not available, actual mine output is used as the production measurement and value is estimated on the basis of the average price of the mineral commodity for that year.

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

⁴Mine shipments of beryllium-containing ores. Calculated based on 4% metal content.

⁵Cobalt content of concentrates.

⁶Recoverable content of ores and concentrates. The values assigned to the quantities are based on the average selling price of refined metal, not the value of the mined material, except for molybdenum and vanadium where the value is based on the metal oxide content.

⁷Production, mine output.

⁸Recoverable content of nickel sulfide concentrates.

⁹Rare-earth-oxide (REO) basis.

¹⁰Based on 80% recovery of estimated rhenium contained in molybdenum disulfide concentrates.

¹¹Withheld to avoid disclosing company proprietary data.

¹²Data rounded to no more than one significant digit to avoid disclosing company proprietary data.

¹³Sold or used unless otherwise specified.

¹⁴Data are rounded to no more than two significant digits.

¹⁵Crude garnet production. Refer to the Minerals Yearbook garnet chapter for refined garnet production.

¹⁶Production based on publicly available data; refer to the Minerals Yearbook kyanite chapter.

¹⁷Includes Puerto Rico.

¹⁸Contained lithium. Source: Rockwood Holdings, Inc., 2014, 2013 annual report: Rockwood Holdings, Inc., p. 16.

¹⁹Excludes abrasive stone.

²⁰Rounded to the nearest 100,000 metric tons.

²¹Domestic bauxite production was used in nonmetallurgical products, such as abrasives, cement, chemicals, proppants, and refractories.

TABLE 2
NONFUEL MINERALS PRODUCED IN THE UNITED STATES, BY COMMODITY AND STATES IN 2015¹

(Principal States based on quantity unless otherwise noted)

| Commodity ² | Principal States ³ | Other States ³ |
|------------------------------------|-------------------------------|--|
| Andalusite | NC | |
| Barite | GA and NV | |
| Beryllium concentrates | UT | |
| Boron minerals | CA | |
| Bromine | AR | |
| Cement: | | |
| Masonry | AL, CA, FL, IN, TX | AR, AZ, CO, GA, KS, MD, ME, MI, MO, MT, NM, NY, OH, OK, PA, SC, TN, VA, WV. |
| Portland | AL, CA, FL, MO, TX | All other States, except AK, CT, DE, HI, ID, LA, MA, MN, MS, NC, ND, NH, NJ, RI, VT, WI. |
| Clay: | | |
| Ball | IN, KY, MS, TN, TX | |
| Bentonite | AL, CA, MT, UT, WY | AZ, MS, NV, OR, TX. |
| Common | AL, NC, OK, OR, TX | All other States, except AK, DE, FL, HI, ID, ME, MN, NH, NJ, NV, RI, VT, WI. |
| Fire | CO, MO, OH, TX | |
| Fuller's earth: | | |
| Attapulgit | FL and GA | |
| Montmorillonite | CA, GA, MO, MS, VA | IL, KS, TN, TX. |
| Kaolin | AL, AR, GA, NV, SC | CA, FL, TX. |
| Cobalt | MI | |
| Copper ⁴ | AZ, MT, NM, NV, UT | ID, MI, MO. |
| Diatomite | CA, NV, OR, WA | |
| Feldspar | CA, ID, NC, SD, VA | OK. |
| Garnet, industrial | ID, MT, NY | |
| Gemstones, natural ⁵ | AZ, CA, ID, MT, OR | All other States. |
| Gold ⁴ | AK, CA, CO, NV, UT | AZ, ID, MT, NM, SD, WA. |
| Gypsum, crude | AR, KS, NV, OK, TX | AZ, CA, CO, IA, IN, LA, MI, NM, SD, UT, WY. |
| Helium: | | |
| Crude | CO, KS, OK, TX, UT | |
| Grade-A | CO, KS, OK, UT, WY | |
| Iodine, crude | OK and TX | |
| Iron ore | MI and MN | |
| Iron oxide pigments, crude | AL and UT | |
| Kyanite | VA | |
| Lead ⁴ | AK, ID, MO, WA | |
| Lime | AL, KY, MO, OH, TX | All other States, except AK, CT, DE, HI, IL, KS, MD, ME, MS, NC, NH, NJ, NM, NY, RI, SC, VT. |
| Lithium carbonate | NV | |
| Magnesite | NV | |
| Magnesium compounds | CA, DE, MI, UT | |
| Magnesium metal | UT | |
| Mica, crude | GA, NC, SD, VA | |
| Molybdenum concentrates | AZ, CO, MT, NV, UT | |
| Nickel ⁴ | MI | |
| Palladium ⁴ | MT | |
| Peat | FL, IL, ME, MI, MN | IA, IN, NJ, NY, OH, PA, WA. |
| Perlite, crude | AZ, ID, NM, NV, OR | |
| Phosphate rock | FL, ID, NC, UT | |
| Platinum ⁴ | MT | |
| Potash | NM and UT | |
| Pumice and pumicite | CA, ID, KS, NM, OR | |
| Pyrophyllite, crude | NC | |
| Rare earths ⁶ | CA | |
| Salt | KS, LA, NY, OH, TX | AL, AZ, CA, MI, NM, NV, OK, TN, UT, VA, WV. |
| Sand and gravel: | | |
| Construction | AZ, CA, MI, MN, TX | All other States. |
| Industrial | IL, MN, MO, TX, WI | All other States, except AK, CT, DE, HI, ID, KS, MA, MD, ME, MT, NH, NM, UT, VT, WY. |
| Silica stone, special ⁷ | AR | |
| Silica, tripoli | AR, IL, MO | |

See footnotes at end of table.

TABLE 2—Continued
NONFUEL MINERALS PRODUCED IN THE UNITED STATES, BY COMMODITY AND STATES IN 2015¹

(Principal States based on quantity unless otherwise noted)

| Commodity ² | Principal States ³ | Other States ³ |
|---|-------------------------------|--|
| Silver ⁴ | AK, AZ, ID, NV, UT | CA, CO, MO, MT, NM, SD. |
| Soda ash | CA and WY | |
| Staurolite | FL and VA | |
| Stone: | | |
| Crushed | FL, MO, OH, PA, TX | All other States. |
| Dimension | GA, IN, MA, TX, WI | All other States, except AK, DE, FL, HI, IA, KY, LA, MS, ND, NE, NJ, OR, RI, WV, WY. |
| Talc, crude | MT, TX, VT | |
| Titanium mineral concentrates, ilmenite | FL, GA, VA | |
| Tungsten | CA | |
| Vermiculite, crude | SC and VA | |
| Wollastonite | NY | |
| Zeolites | AZ, CA, ID, NM, TX | OR. |
| Zinc ⁴ | AK, ID, MO, TN, WA | |
| Zirconium mineral concentrates, zircon | FL, GA, VA | |

¹Includes data available through June 2018.

²In addition to the commodities listed, bauxite was produced in Alabama, Arkansas, and Georgia; cadmium was recovered as a byproduct from zinc concentrates in Tennessee; and rhenium was recovered as a byproduct from molybdenite concentrates in Arizona, Montana, New Mexico, and Utah.

³Listed in alphabetical order by abbreviation.

⁴Recoverable content of ores and concentrates.

⁵Principal States according to value.

⁶Rare-earth-oxide (REO) basis.

⁷Grindstones, pulpstones, and sharpening stones; does not include mill liners and grinding pebbles.

TABLE 3
VALUE OF NONFUEL MINERAL PRODUCTION IN THE UNITED STATES AND PRINCIPAL NONFUEL MINERALS PRODUCED IN 2015^{1,2}

| State | Value (thousands) | Rank ³ | Percent of U.S. total | Principal commodities ⁴ |
|-----------------------------|----------------------|-------------------|--------------------------|---|
| Alabama | \$1,370,000 | 19 | 1.88 | Cement (masonry), cement (portland), lime, sand and gravel (construction), stone (crushed). |
| Alaska | 3,030,000 | 6 | 4.17 | Gold, lead, sand and gravel (construction), silver, zinc. |
| Arizona | 6,470,000 | 2 | 8.89 | Cement (portland), copper, molybdenum concentrates, sand and gravel (construction), stone (crushed). |
| Arkansas | 849,000 | 29 | 1.17 | Bromine, cement (portland), sand and gravel (construction), sand and gravel (industrial), stone (crushed). |
| California | 3,380,000 | 5 | 4.65 | Boron minerals, cement (portland), gold, sand and gravel (construction), stone (crushed). |
| Colorado | 1,280,000 | 20 | 1.76 | Cement (portland), gold, molybdenum concentrates, sand and gravel (construction), stone (crushed). |
| Connecticut ⁵ | 194,000 | 42 | 0.27 | Clay (common), sand and gravel (construction), stone (crushed), stone (dimension). |
| Delaware ⁵ | 19,800 | 50 | 0.03 | Magnesium compounds, sand and gravel (construction), stone (crushed). |
| Florida | 3,010,000 | 7 | 4.14 | Cement (masonry), cement (portland), phosphate rock, sand and gravel (construction), stone (crushed). |
| Georgia | 1,650,000 | 15 | 2.26 | Cement (portland), clay (fuller's earth), clay (kaolin), sand and gravel (construction), stone (crushed). |
| Hawaii | 98,400 | 48 | 0.14 | Gemstones (natural), sand and gravel (construction), stone (crushed). |
| Idaho | 537,000 | 35 | 0.74 | Phosphate rock, lead, sand and gravel (construction), silver, stone (crushed). |
| Illinois ⁵ | 1,740,000 | 14 | 2.39 | Cement (portland), sand and gravel (construction), sand and gravel (industrial), silica (tripoli), stone (crushed). |
| Indiana | 969,000 | 26 | 1.33 | Cement (portland), lime, sand and gravel (construction), stone (crushed), stone (dimension). |
| Iowa ⁵ | 617,000 | 28 | 0.85 | Cement (portland), lime, sand and gravel (construction), sand and gravel (industrial), stone (crushed). |
| Kansas ⁵ | 630,000 | 25 | 0.87 | Cement (portland), helium (Grade-A), salt, sand and gravel (construction), stone (crushed). |
| Kentucky ⁵ | 546,000 | 27 | 0.75 | Cement (portland), lime, sand and gravel (construction), sand and gravel (industrial), stone (crushed). |
| Louisiana ⁵ | 587,000 | 33 | 0.81 | Lime, salt, sand and gravel (construction), sand and gravel (industrial), stone (crushed). |
| Maine ⁵ | 96,000 | 44 | 0.13 | Cement (portland), peat, sand and gravel (construction), stone (crushed), stone (dimension). |
| Maryland ⁵ | 341,000 | 34 | 0.47 | Cement (masonry), cement (portland), sand and gravel (construction), stone (crushed), stone (dimension). |
| Massachusetts ⁵ | 294,000 | 40 | 0.40 | Clay (common), lime, sand and gravel (construction), stone (crushed), stone (dimension). |
| Michigan | 2,750,000 | 8 | 3.79 | Cement (portland), iron ore, nickel, salt, sand and gravel (construction). |
| Minnesota ⁵ | 3,590,000 | 4 | 4.93 | Iron ore, sand and gravel (construction), sand and gravel (industrial), stone (crushed), stone (dimension). |
| Mississippi ⁵ | 139,000 | 43 | 0.19 | Clay (ball), clay (fuller's earth), sand and gravel (construction), sand and gravel (industrial), stone (crushed). |
| Missouri | 2,600,000 | 9 | 3.58 | Cement (portland), lead, lime, sand and gravel (industrial), stone (crushed). |
| Montana | 1,010,000 | 24 | 1.39 | Copper, gold, palladium, platinum, sand and gravel (construction). |
| Nebraska ⁵ | 185,000 | 38 | 0.25 | Cement (portland), lime, sand and gravel (construction), sand and gravel (industrial), stone (crushed). |
| Nevada | 7,260,000 | 1 | 9.98 | Copper, diatomite, gold, lime, silver. |
| New Hampshire ⁵ | 104,000 | 47 | 0.14 | Sand and gravel (construction), stone (crushed), stone (dimension). |
| New Jersey | 278,000 | 41 | 0.38 | Peat, sand and gravel (construction), sand and gravel (industrial), stone (crushed). |
| New Mexico | 1,630,000 | 16 | 2.24 | Copper, potash, salt, sand and gravel (construction), stone (crushed). |
| New York ⁵ | 1,430,000 | 17 | 1.96 | Cement (portland), salt, sand and gravel (construction), stone (crushed), wollastonite. |
| North Carolina ⁵ | 936,000 | 22 | 1.29 | Clay (common), phosphate rock, sand and gravel (construction), sand and gravel (industrial), stone (crushed). |
| North Dakota ⁵ | 122,000 | 45 | 0.17 | Clay (common), lime, sand and gravel (construction), sand and gravel (industrial), stone (crushed). |
| Ohio ⁵ | 1,200,000 | 18 | 1.65 | Cement (portland), lime, salt, sand and gravel (construction), stone (crushed). |
| Oklahoma | 780,000 | 31 | 1.07 | Cement (portland), gypsum (crude), sand and gravel (construction), sand and gravel (industrial), stone (crushed). |
| Oregon | 394,000 | 36 | 0.54 | Cement (portland), diatomite, perlite (crude), sand and gravel (construction), stone (crushed). |
| Pennsylvania ⁵ | 1,850,000 | 12 | 2.54 | Cement (portland), lime, sand and gravel (construction), sand and gravel (industrial), stone (crushed). |
| Rhode Island ⁵ | 53,400 | 49 | 0.07 | Sand and gravel (construction), sand and gravel (industrial), stone (crushed). |
| South Carolina ⁵ | 721,000 | 32 | 0.99 | Cement (masonry), cement (portland), clay (kaolin), sand and gravel (construction), stone (crushed). |
| South Dakota | 328,000 | 39 | 0.45 | Cement (portland), gold, lime, sand and gravel (construction), stone (crushed). |
| Tennessee | 1,050,000 | 23 | 1.44 | Cement (portland), sand and gravel (construction), sand and gravel (industrial), stone (crushed), zinc. |
| Texas | 4,950,000 | 3 | 6.81 | Cement (portland), salt, sand and gravel (construction), sand and gravel (industrial), stone (crushed). |
| Utah | 2,120,000 | 11 | 2.92 | Cement (portland), copper, magnesium metal, potash, sand and gravel (construction). |
| Vermont ⁵ | 133,000 | 46 | 0.18 | Sand and gravel (construction), stone (crushed), stone (dimension), talc (crude). |
| Virginia | 1,210,000 | 21 | 1.66 | Cement (portland), clay (fuller's earth), lime, sand and gravel (construction), stone (crushed). |

See footnotes at end of table.

TABLE 3—Continued

VALUE OF NONFUEL MINERAL PRODUCTION IN THE UNITED STATES AND PRINCIPAL NONFUEL MINERALS PRODUCED IN 2015^{1,2}

| State | Value (thousands) | Rank ³ | Percent of U.S. total | Principal commodities ⁴ |
|----------------------------|----------------------|-------------------|--------------------------|---|
| Washington | 801,000 | 30 | 1.10 | Cement (portland), gold, sand and gravel (construction), stone (crushed), zinc. |
| West Virginia ⁵ | 208,000 | 37 | 0.29 | Cement (masonry), cement (portland), lime, sand and gravel (industrial), stone (crushed). |
| Wisconsin ⁵ | 1,770,000 | 13 | 2.43 | Lime, sand and gravel (construction), sand and gravel (industrial), stone (crushed), stone (dimension). |
| Wyoming | 2,480,000 | 10 | 3.41 | Cement (portland), clay (bentonite), helium (Grade-A), sand and gravel (construction), soda ash. |
| Undistributed | 2,950,000 | XX | 4.05 | XX |
| Total | 72,700,000 | XX | 100.00 | XX |

XX Not applicable.

¹Includes data available through June 2018.²Data are rounded to no more than three significant digits; may not add to totals shown.³Rank based on total, unadjusted, State values.⁴Listed in alphabetical order.⁵Partial total; excludes values that must be withheld to avoid disclosing company proprietary data, which are included with "Undistributed."

TABLE 4
 VALUE OF NONFUEL MINERAL PRODUCTION PER CAPITA AND PER SQUARE KILOMETER IN 2015, BY STATE¹

| State | Land area ² (square kilometers) | Population ² (thousands) | Value of nonfuel mineral production ³ | | | | |
|------------------|--|--|--|------------|-------------------|----------------------|-------------------|
| | | | Total (thousands) | Per capita | | Per square kilometer | |
| | | | | Dollars | Rank ⁴ | Dollars | Rank ⁴ |
| Alabama | 131,171 | 4,859 | \$1,370,000 | 282 | 15 | 10,400 | 20 |
| Alaska | 1,477,953 | 738 | 3,030,000 | 4,110 | 2 | 2,050 | 44 |
| Arizona | 294,207 | 6,828 | 6,470,000 | 947 | 5 | 22,000 | 4 |
| Arkansas | 134,771 | 2,978 | 849,000 | 285 | 14 | 6,300 | 30 |
| California | 403,466 | 39,145 | 3,380,000 | 86 | 41 | 8,370 | 28 |
| Colorado | 268,431 | 5,457 | 1,280,000 | 235 | 18 | 4,780 | 37 |
| Connecticut | 12,542 | 3,591 | 194,000 ⁵ | 54 | 47 | 15,500 | 9 |
| Delaware | 5,047 | 946 | 19,800 ⁵ | 21 | 48 | 3,920 | 26 |
| Florida | 138,887 | 20,271 | 3,010,000 | 149 | 29 | 21,700 | 5 |
| Georgia | 148,959 | 10,215 | 1,650,000 | 161 | 26 | 11,100 | 18 |
| Hawaii | 16,635 | 1,432 | 98,400 | 69 | 44 | 5,920 | 33 |
| Idaho | 214,045 | 1,655 | 537,000 | 325 | 12 | 2,510 | 43 |
| Illinois | 143,793 | 12,860 | 1,740,000 ⁵ | 135 | 34 | 12,100 | 16 |
| Indiana | 92,789 | 6,620 | 969,000 | 146 | 31 | 10,400 | 19 |
| Iowa | 144,669 | 3,124 | 617,000 ⁵ | 198 | 17 | 4,270 | 34 |
| Kansas | 211,754 | 2,912 | 630,000 ⁵ | 217 | 11 | 2,980 | 40 |
| Kentucky | 102,269 | 4,425 | 546,000 ⁵ | 123 | 22 | 5,340 | 27 |
| Louisiana | 111,898 | 4,671 | 587,000 ⁵ | 126 | 32 | 5,250 | 32 |
| Maine | 79,883 | 1,329 | 96,000 ⁵ | 72 | 38 | 1,200 | 46 |
| Maryland | 25,142 | 6,006 | 341,000 ⁵ | 57 | 39 | 13,600 | 2 |
| Massachusetts | 20,202 | 6,794 | 294,000 ⁵ | 43 | 49 | 14,600 | 10 |
| Michigan | 146,435 | 9,923 | 2,750,000 | 278 | 16 | 18,800 | 6 |
| Minnesota | 206,232 | 5,490 | 3,590,000 ⁵ | 653 | 8 | 17,400 | 7 |
| Mississippi | 121,531 | 2,992 | 139,000 ⁵ | 46 | 45 | 1,140 | 49 |
| Missouri | 178,040 | 6,084 | 2,600,000 | 428 | 9 | 14,600 | 12 |
| Montana | 376,962 | 1,033 | 1,010,000 | 977 | 4 | 2,680 | 42 |
| Nebraska | 198,974 | 1,896 | 185,000 ⁵ | 97 | 21 | 929 | 45 |
| Nevada | 284,332 | 2,891 | 7,260,000 | 2,510 | 3 | 25,500 | 1 |
| New Hampshire | 23,187 | 1,331 | 104,000 ⁵ | 78 | 43 | 4,480 | 38 |
| New Jersey | 19,047 | 8,958 | 278,000 | 31 | 50 | 14,600 | 13 |
| New Mexico | 314,161 | 2,085 | 1,630,000 | 780 | 6 | 5,180 | 36 |
| New York | 122,057 | 19,796 | 1,430,000 ⁵ | 72 | 42 | 11,700 | 15 |
| North Carolina | 125,920 | 10,043 | 936,000 ⁵ | 93 | 36 | 7,440 | 24 |
| North Dakota | 178,711 | 757 | 122,000 ⁵ | 161 | 24 | 683 | 50 |
| Ohio | 105,829 | 11,613 | 1,200,000 ⁵ | 103 | 35 | 11,300 | 11 |
| Oklahoma | 177,660 | 3,911 | 780,000 | 199 | 23 | 4,390 | 41 |
| Oregon | 248,608 | 4,029 | 394,000 | 98 | 40 | 1,590 | 48 |
| Pennsylvania | 115,883 | 12,803 | 1,850,000 ⁵ | 144 | 30 | 16,000 | 8 |
| Rhode Island | 2,678 | 1,056 | 53,400 ⁵ | 51 | 46 | 19,900 | 3 |
| South Carolina | 77,857 | 4,896 | 721,000 ⁵ | 147 | 28 | 9,260 | 25 |
| South Dakota | 196,350 | 858 | 328,000 | 382 | 10 | 1,670 | 47 |
| Tennessee | 106,798 | 6,600 | 1,050,000 | 158 | 27 | 9,790 | 23 |
| Texas | 676,587 | 27,469 | 4,950,000 | 180 | 25 | 7,320 | 29 |
| Utah | 212,818 | 2,996 | 2,120,000 | 709 | 7 | 9,980 | 21 |
| Vermont | 23,871 | 626 | 133,000 ⁵ | 212 | 19 | 5,570 | 35 |
| Virginia | 102,279 | 8,383 | 1,210,000 | 144 | 33 | 11,800 | 17 |
| Washington | 172,119 | 7,170 | 801,000 | 112 | 37 | 4,660 | 39 |
| West Virginia | 62,259 | 1,844 | 208,000 ⁵ | 113 | 20 | 3,330 | 31 |
| Wisconsin | 140,268 | 5,771 | 1,770,000 ⁵ | 307 | 13 | 12,600 | 14 |
| Wyoming | 251,470 | 586 | 2,480,000 | 4,230 | 1 | 9,860 | 22 |
| Undistributed | XX | XX | 2,950,000 | XX | XX | XX | XX |
| Total or average | 9,147,436 ⁶ | 320,746 ⁶ | 72,700,000 | 227 | XX | 7,950 | XX |

See footnotes at end of table.

TABLE 4—Continued
VALUE OF NONFUEL MINERAL PRODUCTION PER CAPITA AND PER SQUARE KILOMETER IN 2015, BY STATE¹

XX Not applicable.

¹Includes data available through June 2018.

²Source: U.S. Census Bureau State and national total values.

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

⁴Rank based on total, unadjusted, State values.

⁵Partial total; excludes values that must be withheld to avoid disclosing company proprietary data, which are included with “Undistributed.”

⁶Excludes Washington, DC (which has no mineral production), with an area of 158 square kilometers and a population of 672,228.

TABLE 5
NONFUEL MINERAL PRODUCTION IN THE UNITED STATES, BY STATE^{1,2,3}

(Thousand metric tons and thousand dollars unless otherwise specified)

| Commodity | 2013 | | 2014 | | 2015 | | |
|--|-------------|------------------------|----------------------|------------------------|------------------------|-----------|----------------------|
| | Quantity | Value | Quantity | Value | Quantity | Value | |
| Alabama: | | | | | | | |
| Clay, common | 1,190 | 8,630 | 1,170 ^r | 5,340 ^r | 1,090 | 4,120 | |
| Gemstones, natural ^e | NA | 7 | NA | 7 | NA | 92 | |
| Lime | 2,270 | 289,000 | 2,280 | 294,000 | 2,340 | 302,000 | |
| Sand and gravel: | | | | | | | |
| Construction | 9,210 | 61,700 | 8,850 ^r | 61,000 ^r | 10,700 | 74,500 | |
| Industrial | 334 | 14,900 | 1,150 ^r | 33,800 ^r | 972 | 23,700 | |
| Stone, crushed | 36,400 | 362,000 ^r | 37,200 ^r | 396,000 ^r | 38,500 | 431,000 | |
| Combined values of bauxite, cement, clay (bentonite and kaolin), iron oxide pigments (crude), salt, stone (dimension) | XX | 365,000 | XX | 446,000 | XX | 534,000 | |
| Total | XX | 1,100,000 | XX | 1,240,000 | XX | 1,370,000 | |
| Alaska: | | | | | | | |
| Gemstones, natural ^e | NA | 70 | NA | 60 | NA | 73 | |
| Gold ⁴ | kilograms | 32,200 | 1,470,000 | 31,400 | 1,280,000 | 28,000 | 1,050,000 |
| Lead ⁴ | metric tons | 143,000 | 362,000 | 166,000 | 388,000 | 161,000 | 324,000 |
| Sand and gravel, construction | | 10,100 ^r | 67,400 ^r | 8,360 ^r | 63,200 ^r | 8,900 | 77,500 |
| Silver ⁴ | kilograms | 485,000 ^r | 371,000 ^r | 481,000 | 299,000 | 490,000 | 248,000 |
| Stone, crushed | | 952 | 12,000 | 959 ^r | 12,400 ^r | 1,040 | 12,400 |
| Zinc ⁴ | metric tons | 609,000 | 1,280,000 | 660,000 ^r | 1,560,000 | 629,000 | 1,330,000 |
| Total | XX | 3,560,000 ^r | XX | 3,600,000 | XX | 3,030,000 | |
| Arizona: | | | | | | | |
| Copper ⁴ | | 795 | 5,960,000 | 893 | 6,260,000 | 961 | 5,430,000 |
| Gemstones, natural ^e | | NA | 2,360 | NA | 2,370 | NA | 1,420 |
| Sand and gravel, construction | | 35,300 ^r | 308,000 ^r | 36,200 ^r | 313,000 ^r | 38,700 | 345,000 |
| Silver | kilograms | 88,800 | 62,600 | 91,400 | 56,900 | 99,200 | 50,100 |
| Stone: | | | | | | | |
| Crushed | | 7,990 ^r | 70,600 ^r | 8,520 ^r | 67,900 ^r | 9,360 | 74,800 |
| Dimension | | 57 | 6,420 | 55 | 6,080 | 62 | 6,660 |
| Combined values of cement, clay [bentonite (2015) and common (2013–15)], gold, gypsum (crude), lime, molybdenum concentrates, perlite (crude), rhenium, salt, sand and gravel (industrial), zeolites | | XX | 648,000 ^r | XX | 738,000 ^r | XX | 559,000 |
| Total | XX | 7,060,000 ^r | XX | 7,440,000 ^r | XX | 6,470,000 | |
| Arkansas: | | | | | | | |
| Gemstones, natural ^e | | NA | 413 | NA | 429 | NA | 441 |
| Sand and gravel: | | | | | | | |
| Construction | | 8,030 ^r | 68,500 ^r | 8,080 ^r | 69,800 ^r | 7,510 | 66,000 |
| Industrial | | 2,130 | 133,000 | 3,180 | 248,000 | 1,990 | 146,000 |
| Silica stone, special | metric tons | 146 | 36 | 146 ^e | 36 ^e | 205 | 49 |
| Stone: | | | | | | | |
| Crushed | | 25,100 | 197,000 | 26,000 ^r | 212,000 ^r | 26,700 | 226,000 |
| Dimension | | 10 | 1,320 | 10 | 1,290 | 10 | 1,290 |
| Combined values of bauxite, bromine, cement, clay (common and kaolin), gypsum (crude), lime, silica (tripoli) | | XX | 302,000 | XX | 384,000 ^r | XX | 409,000 |
| Total | XX | 702,000 | XX | 915,000 | XX | 849,000 | |
| California: | | | | | | | |
| Cement: | | | | | | | |
| Masonry | | 178 | 19,600 ^e | 186 | 20,100 ^e | 188 | 20,800 ^e |
| Portland | | 9,260 | 714,000 ^e | 9,810 | 829,000 ^e | 9,770 | 887,000 ^e |
| Gemstones, natural ^e | | NA | 1,220 | NA | 1,210 | NA | 882 |
| Gypsum, crude | | 892 | 15,400 | 689 | 6,030 | 690 | 5,930 |
| Rare earths ^{e,5} | metric tons | 5,500 | W | 5,400 | W | 5,900 | W |
| Sand and gravel: | | | | | | | |
| Construction | | 86,600 ^r | 964,000 ^r | 86,000 ^r | 1,000,000 ^r | 97,000 | 1,090,000 |
| Industrial | | 863 | 42,500 | 1,520 | 52,500 | 1,860 | 66,100 |

See footnotes at end of table.

TABLE 5—Continued
NONFUEL MINERAL PRODUCTION IN THE UNITED STATES, BY STATE^{1,2,3}

(Thousand metric tons and thousand dollars unless otherwise specified)

| Commodity | 2013 | | 2014 | | 2015 | |
|--|---------------------|------------------------|---------------------|------------------------|----------|----------------------|
| | Quantity | Value | Quantity | Value | Quantity | Value |
| California:—Continued | | | | | | |
| Stone: | | | | | | |
| Crushed | 34,500 ^r | 321,000 ^r | 37,500 ^r | 321,000 ^r | 38,400 | 331,000 |
| Dimension | 24 | 9,210 | 23 | 9,170 | 21 | 7,780 |
| Combined values of boron minerals, clay (bentonite, common, fuller's earth, kaolin), diatomite, feldspar, gold, lime, magnesium compounds, perlite [crude (2013)], pumice and pumicite, salt, silver, soda ash, tungsten, zeolites, and values indicated by symbol W | XX | 1,290,000 ^r | XX | 916,000 ^r | XX | 971,000 |
| Total | XX | 3,370,000 ^r | XX | 3,160,000 ^r | XX | 3,380,000 |
| Colorado: | | | | | | |
| Clay, common | 187 | 4,820 | (6) | W | (6) | W |
| Gemstones, natural ^e | NA | 447 | NA | 451 | NA | 326 |
| Sand and gravel, construction | 31,200 | 222,000 | 34,200 ^r | 242,000 ^r | 33,800 | 260,000 |
| Stone: | | | | | | |
| Crushed | 10,400 | 81,200 | 12,700 ^r | 108,000 ^r | 12,900 | 114,000 |
| Dimension | 18 | 7,270 | 17 | 6,230 | 20 | 9,570 |
| Combined values of cement, clay [bentonite (2013–14) and fire (2013–15)], gold, gypsum (crude), helium [crude (2015) and Grade-A (2013–15)], lime, molybdenum concentrates, sand and gravel (industrial), silver, and values indicated by symbol W | XX | 1,090,000 ^r | XX | 1,230,000 ^r | XX | 899,000 |
| Total | XX | 1,400,000 ^r | XX | 1,590,000 ^r | XX | 1,280,000 |
| Connecticut: | | | | | | |
| Clay, common | (6) | (7) | (6) | (7) | (6) | (7) |
| Gemstones, natural ^e | NA | 7 | NA | 7 | NA | 8 |
| Sand and gravel, construction | 5,100 | 47,200 | 5,360 | 55,300 ^r | 5,120 | 49,900 |
| Stone: | | | | | | |
| Crushed | 8,740 | 129,000 | 9,220 ^r | 144,000 ^r | 9,360 | 142,000 |
| Dimension | (6) | (7) | (6) | (7) | 12 | 2,360 |
| Total | XX | 176,000 | XX | 200,000 ^r | XX | 194,000 |
| Delaware: | | | | | | |
| Gemstones, natural ^e | NA | 1 | NA | 1 | NA | 2 |
| Magnesium compounds | (6) | (7) | (6) | (7) | (6) | (7) |
| Sand and gravel, construction | 1,600 ^r | 12,600 ^r | 1,500 ^r | 15,100 ^r | 2,370 | 19,800 |
| Stone, crushed | (6) | (7) | (6) | (7) | (6) | (7) |
| Total | XX | 12,600 ^r | XX | 15,100 ^r | XX | 19,800 |
| Florida: | | | | | | |
| Cement: | | | | | | |
| Masonry | 342 | 42,500 ^e | 365 | 47,700 ^e | 400 | 51,900 ^e |
| Portland | 4,680 | 402,000 ^e | 4,990 | 453,000 ^e | 5,500 | 551,000 ^e |
| Gemstones, natural ^e | NA | 1 | NA | 2 | NA | 2 |
| Peat | 338,000 | 6,800 | 370,000 | 7,340 | 317,000 | 7,110 |
| Sand and gravel: | | | | | | |
| Construction | 14,700 | 133,000 | 16,000 | 152,000 | 17,200 | 176,000 |
| Industrial | 200 | 10,300 | 219 | 12,100 | 485 | 32,100 |
| Stone, crushed | 53,800 ^r | 631,000 ^r | 57,700 ^r | 681,000 | 61,600 | 701,000 |
| Combined values of clay (fuller's earth and kaolin), lime, phosphate rock, staurolite, titanium mineral concentrates (ilmenite), zirconium mineral concentrates (zircon) | XX | 2,370,000 | XX | 1,540,000 | XX | 1,490,000 |
| Total | XX | 3,590,000 | XX | 2,890,000 | XX | 3,010,000 |
| Georgia: | | | | | | |
| Barite | 7 | 1,350 ^e | 14 | 2,800 ^e | 15 | 2,970 ^e |
| Clay, kaolin | 5,580 | 852,000 | 5,660 | 853,000 | 5,390 | 727,000 |
| Gemstones, natural ^e | NA | 103 | NA | 103 | NA | 24 |

See footnotes at end of table.

TABLE 5—Continued
NONFUEL MINERAL PRODUCTION IN THE UNITED STATES, BY STATE^{1,2,3}

(Thousand metric tons and thousand dollars unless otherwise specified)

| Commodity | 2013 | | 2014 | | 2015 | |
|--|---------------------|------------------------|---------------------|------------------------|----------|----------------------|
| | Quantity | Value | Quantity | Value | Quantity | Value |
| Georgia:—Continued | | | | | | |
| Sand and gravel: | | | | | | |
| Construction | 5,090 | 33,000 | 5,490 | 37,000 ^r | 5,810 | 41,400 |
| Industrial | 596 | 15,800 | 520 | 18,000 | (6) | W |
| Stone: | | | | | | |
| Crushed | 40,400 | 494,000 | 44,200 ^r | 553,000 ^r | 49,300 | 652,000 |
| Dimension | 145 | 17,200 | 152 | 15,500 | 140 | 13,000 |
| Combined values of bauxite, cement, clay (common and fuller's earth), feldspar (2013–14), lime, mica (crude), titanium mineral concentrates [ilmenite (2015)], zirconium mineral concentrates [zircon (2015)], and value indicated by symbol W | XX | 136,000 ^r | XX | 149,000 ^r | XX | 209,000 |
| Total | XX | 1,550,000 | XX | 1,630,000 | XX | 1,650,000 |
| Hawaii: | | | | | | |
| Gemstones, natural ^e | NA | 139 | NA | 136 | NA | 103 |
| Sand and gravel, construction | 662 ^r | 10,100 | 492 | 7,830 | 459 | 10,300 |
| Stone, crushed | 5,420 | 92,300 | 4,500 ^r | 88,200 ^r | 4,460 | 88,000 |
| Total | XX | 103,000 ^r | XX | 96,200 ^r | XX | 98,400 |
| Idaho: | | | | | | |
| Gemstones, natural ^e | NA | 371 | NA | 399 | NA | 1,630 |
| Sand and gravel, construction | 11,500 ^r | 69,300 ^r | 13,800 ^r | 82,300 ^r | 14,200 | 82,600 |
| Stone: | | | | | | |
| Crushed | 3,820 | 24,000 | 4,380 | 28,400 ^r | 5,010 | 33,800 |
| Dimension | 33 ^r | 5,840 | 64 | 8,640 | 45 | 7,050 |
| Combined values of copper, feldspar, garnet (industrial), gold (2015), lead, lime, molybdenum concentrates (2013–14), perlite (crude), phosphate rock, pumice and pumicite, silver, zeolites, zinc | XX | 614,000 ^r | XX | 585,000 ^r | XX | 412,000 |
| Total | XX | 713,000 ^r | XX | 705,000 ^r | XX | 537,000 |
| Illinois: | | | | | | |
| Cement, portland | 1,100 | 106,000 ^e | 1,220 | 126,000 ^e | 1,410 | 153,000 ^e |
| Gemstones, natural ^e | NA | 10 | NA | 10 | NA | 11 |
| Sand and gravel: | | | | | | |
| Construction | 18,300 ^r | 127,000 ^r | 18,300 ^r | 126,000 ^r | 21,500 | 148,000 |
| Industrial | 9,850 | 501,000 | 13,500 | 1,290,000 | 14,100 | 867,000 |
| Stone, crushed | 45,800 | 472,000 | 52,300 ^r | 521,000 ^r | 54,300 | 569,000 |
| Combined values of cement (masonry), clay (common and fuller's earth), peat, silica (tripoli), stone (dimension) | XX | (7) | XX | (7) | XX | (7) |
| Total | XX | 1,210,000 ^r | XX | 2,060,000 ^r | XX | 1,740,000 |
| Indiana: | | | | | | |
| Cement, portland | 2,280 | 191,000 ^e | 2,400 | 208,000 ^e | 2,560 | 254,000 ^e |
| Clay, common | 294 | 6,490 | (6) | W | (6) | W |
| Gemstones, natural ^e | NA | 4 | NA | 4 | NA | 5 |
| Sand and gravel, construction | 18,300 | 133,000 ^r | 17,600 | 132,000 | 17,300 | 134,000 |
| Stone: | | | | | | |
| Crushed | 41,000 | 304,000 | 44,400 ^r | 342,000 ^r | 49,500 | 381,000 |
| Dimension | 150 | 26,200 | 200 | 34,400 | 211 | 39,700 |
| Combined values of cement (masonry), clay (ball), gypsum (crude), lime, peat, sand and gravel (industrial), and values indicated by symbol W | XX | 156,000 ^r | XX | 170,000 ^r | XX | 161,000 |
| Total | XX | 816,000 ^r | XX | 886,000 ^r | XX | 969,000 |
| Iowa: | | | | | | |
| Gemstones, natural ^e | NA | 3 | NA | 3 | NA | 3 |
| Sand and gravel: | | | | | | |
| Construction | 13,500 ^r | 84,900 ^r | 13,500 ^r | 92,700 ^r | 14,800 | 118,000 |
| Industrial | (6) | W | (6) | W | 1,790 | 133,000 |
| Stone, crushed | 32,100 ^r | 300,000 ^r | 33,300 ^r | 319,000 ^r | 35,800 | 366,000 |

See footnotes at end of table.

TABLE 5—Continued
NONFUEL MINERAL PRODUCTION IN THE UNITED STATES, BY STATE^{1,2,3}

(Thousand metric tons and thousand dollars unless otherwise specified)

| Commodity | 2013 | | 2014 | | 2015 | |
|---|---------------------|----------------------|---------------------|----------------------|----------|----------------------|
| | Quantity | Value | Quantity | Value | Quantity | Value |
| Iowa:—Continued | | | | | | |
| Combined values of cement, clay (common), gypsum (crude), lime, peat, and values indicated by symbol W | XX | 326,000 | XX | (7) | XX | (7) |
| Total | XX | 711,000 ^r | XX | 412,000 ^r | XX | 617,000 |
| Kansas: | | | | | | |
| Cement, portland | 1,780 | 178,000 ^e | 2,010 | 202,000 ^e | 2,140 | 207,000 ^e |
| Clay, common | 309 | 1,800 | (6) | (7) | (6) | (7) |
| Gemstones, natural ^e | NA | 1 | NA | 1 | NA | 2 |
| Salt | 2,650 | 174,000 | 2,930 | 194,000 | 2,830 | 207,000 |
| Sand and gravel, construction | 8,750 ^r | 49,000 ^r | 8,580 ^r | 48,600 ^r | 9,320 | 57,000 |
| Stone: | | | | | | |
| Crushed | 15,400 | 131,000 | 16,100 ^r | 137,000 ^r | 17,300 | 159,000 |
| Dimension | 43 | 5,610 | 14 | 1,330 | 11 | 1,090 |
| Combined values of cement (masonry), clay (fuller's earth), gypsum (crude), helium (crude and Grade-A), pumice and pumicite | XX | (7) | XX | (7) | XX | (7) |
| Total | XX | 540,000 | XX | 583,000 ^r | XX | 630,000 |
| Kentucky: | | | | | | |
| Gemstones, natural ^e | NA | 11 | NA | 11 | NA | 16 |
| Sand and gravel, construction | 8,350 | 43,700 | 8,510 | 41,500 | 9,040 | 45,500 |
| Stone, crushed | 48,700 | 453,000 | 51,000 ^r | 460,000 ^r | 54,500 | 500,000 |
| Combined values of cement, clay (ball and common), lime, sand and gravel (industrial) | XX | (7) | XX | (7) | XX | (7) |
| Total | XX | 497,000 | XX | 502,000 ^r | XX | 546,000 |
| Louisiana: | | | | | | |
| Gemstones, natural ^e | NA | 7 | NA | 7 | NA | 8 |
| Salt | 14,300 | 318,000 | 14,800 | 344,000 | 12,700 | 325,000 |
| Sand and gravel: | | | | | | |
| Construction | 18,400 ^r | 188,000 ^r | 17,800 ^r | 220,000 ^r | 16,400 | 185,000 |
| Industrial | 709 | 36,200 | 2,120 ^r | 147,000 | 2,280 | 76,700 |
| Combined values of clay (common), gypsum (crude), lime, stone (crushed) | XX | (7) | XX | (7) | XX | (7) |
| Total | XX | 542,000 ^r | XX | 711,000 ^r | XX | 587,000 |
| Maine: | | | | | | |
| Gemstones, natural ^e | NA | 364 | NA | 370 | NA | 376 |
| Sand and gravel, construction | 7,550 ^r | 52,400 ^r | 7,250 ^r | 54,100 ^r | 7,760 | 60,700 |
| Stone: | | | | | | |
| Crushed | 3,690 | 30,800 | 3,830 | 31,500 | 4,220 | 33,100 |
| Dimension | 5 | 2,770 | 5 | 2,820 | 3 | 1,840 |
| Combined values of cement, clay [common (2014–15)], peat | XX | (7) | XX | (7) | XX | (7) |
| Total | XX | 86,300 ^r | XX | 88,700 ^r | XX | 96,000 |
| Maryland: | | | | | | |
| Gemstones, natural ^e | NA | 1 | NA | 1 | NA | 2 |
| Sand and gravel, construction | 6,540 | 76,900 | 7,110 | 91,600 ^r | 7,570 | 95,000 |
| Stone: | | | | | | |
| Crushed | 20,100 ^r | 189,000 ^r | 21,700 ^r | 222,000 ^r | 22,800 | 245,000 |
| Dimension | 2 | 687 | 3 | 723 | 4 | 728 |
| Combined values of cement and clay (common) | XX | (7) | XX | (7) | XX | (7) |
| Total | XX | 267,000 ^r | XX | 315,000 ^r | XX | 341,000 |
| Massachusetts: | | | | | | |
| Clay, common | (6) | (7) | (6) | (7) | (6) | (7) |
| Gemstones, natural ^e | NA | 1 | NA | 1 | NA | 2 |
| Lime | (6) | (7) | (6) | (7) | (6) | (7) |
| Sand and gravel, construction | 11,800 ^r | 107,000 ^r | 11,000 ^r | 88,200 ^r | 10,100 | 92,500 |

See footnotes at end of table.

TABLE 5—Continued
 NONFUEL MINERAL PRODUCTION IN THE UNITED STATES, BY STATE^{1,2,3}

(Thousand metric tons and thousand dollars unless otherwise specified)

| Commodity | 2013 | | 2014 | | 2015 | |
|--|-------------|----------------------|---------------------|------------------------|----------|----------------------|
| | Quantity | Value | Quantity | Value | Quantity | Value |
| Massachusetts:—Continued | | | | | | |
| Stone: | | | | | | |
| Crushed | 10,100 | 130,000 | 10,600 ^r | 146,000 ^r | 11,800 | 160,000 |
| Dimension | 148 | 43,500 | 165 | 43,100 | 160 | 41,900 |
| Total | XX | 281,000 ^r | XX | 278,000 ^r | XX | 294,000 |
| Michigan: | | | | | | |
| Cement: | | | | | | |
| Masonry | 61 | 8,500 ^e | 43 | 6,100 ^e | 92 | 14,000 ^e |
| Portland | 3,860 | 370,000 ^e | 3,950 | 399,000 ^e | 4,190 | 470,000 ^e |
| Cobalt ^{e,8} | metric tons | -- | 120 | W | 760 | W |
| Copper ⁹ | do. | -- | 3,910 | W | 24,300 | W |
| Gemstones, natural ^e | | NA | NA | 2 | NA | 15 |
| Gypsum, crude | | 233 | 233 | 2,050 | (6) | W |
| Iron ore ¹⁰ | | 10,700 | 12,100 | 1,240,000 | 10,800 | 852,000 |
| Lime | | 524 | 526 | 65,400 | 474 | 60,200 |
| Nickel ^{9,11} | metric tons | -- | 4,300 | W | 27,200 | W |
| Sand and gravel: | | | | | | |
| Construction | | 32,500 ^r | 36,400 ^r | 204,000 ^r | 39,600 | 243,000 |
| Industrial | | 1,230 | 1,590 | 112,000 | 3,370 | 77,300 |
| Stone, crushed | | 26,700 ^r | 26,300 ^r | 194,000 ^r | 27,700 | 201,000 |
| Combined values of clay (common), magnesium compounds, peat, potash (2013), salt, stone (dimension), and values indicated by symbol W | | | | | | |
| | | XX | XX | 427,000 | XX | 836,000 |
| Total | | XX | XX | 2,650,000 | XX | 2,750,000 |
| Minnesota: | | | | | | |
| Clay, common | | (6) | (6) | (7) | -- | -- |
| Gemstones, natural ^e | | NA | NA | 7 | NA | 8 |
| Iron ore | | 40,800 | 43,000 | 3,410,000 | 35,400 | 2,890,000 |
| Lime | | (6) | (6) | (7) | (6) | (7) |
| Peat | metric tons | 55,200 ^r | 47,700 ^r | 2,740 | 58,300 | 2,860 |
| Sand and gravel: | | | | | | |
| Construction | | 41,500 ^r | 42,000 ^r | 189,000 ^r | 48,400 | 237,000 |
| Industrial | | 4,140 | 7,220 | 574,000 | 5,170 | 335,000 |
| Stone: | | | | | | |
| Crushed | | 8,090 ^r | 8,920 ^r | 105,000 ^r | 7,610 | 95,700 |
| Dimension | | 59 | 51 | 21,000 | 51 | 20,800 |
| Total | | XX | XX | 4,300,000 | XX | 3,590,000 |
| Mississippi: | | | | | | |
| Gemstones, natural ^e | | NA | NA | 1 | NA | 2 |
| Sand and gravel: | | | | | | |
| Construction | | 10,300 | 10,700 ^r | 82,100 ^r | 9,950 | 78,900 |
| Industrial | | -- | 373 | 5,520 | 451 | 5,260 |
| Stone, crushed | | 1,920 | 2,140 | 60,600 | 1,880 | 54,700 |
| Combined values of clay (ball, bentonite, common, fuller's earth) | | | | | | |
| | | XX | XX | (7) | XX | (7) |
| Total | | XX | XX | 148,000 ^r | XX | 139,000 |
| Missouri: | | | | | | |
| Cement, portland | | 8,220 | 8,780 | 844,000 ^e | 8,540 | 849,000 ^e |
| Sand and gravel: | | | | | | |
| Construction | | 11,200 | 10,600 ^r | 67,500 ^r | 9,830 | 67,200 |
| Industrial | | 1,990 | 4,290 | 289,000 | 6,290 | 385,000 |
| Stone, crushed | | 68,500 ^r | 70,900 ^r | 562,000 ^r | 70,300 | 523,000 |
| Combined values of cement (masonry), clay (common, fire, fuller's earth), copper, gemstones (natural), lead, lime, silica (tripoli), silver, stone (dimension), zinc | | | | | | |
| | | XX | XX | 903,000 | XX | 779,000 |
| Total | | XX | XX | 2,660,000 ^r | XX | 2,600,000 |

See footnotes at end of table.

TABLE 5—Continued
NONFUEL MINERAL PRODUCTION IN THE UNITED STATES, BY STATE^{1,2,3}

(Thousand metric tons and thousand dollars unless otherwise specified)

| Commodity | 2013 | | 2014 | | 2015 | |
|---|---------------------|------------------------|---------------------|------------------------|----------|-----------|
| | Quantity | Value | Quantity | Value | Quantity | Value |
| Montana: | | | | | | |
| Gemstones, natural ^e | NA | 539 | NA | 544 | NA | 583 |
| Palladium ⁴ kilograms | 12,600 | 295,000 | 12,400 | 324,000 | 12,500 | 280,000 |
| Platinum ⁴ do. | 3,720 | 178,000 | 3,660 | 163,000 | 3,670 | 125,000 |
| Sand and gravel, construction | 13,200 ^r | 100,000 ^r | 10,900 ^r | 89,600 ^r | 11,900 | 90,900 |
| Stone: | | | | | | |
| Crushed | 2,680 ^r | 25,900 ^r | 2,910 | 26,000 ^r | 2,790 | 28,000 |
| Dimension | 31 | 1,590 | 28 | 1,970 | 24 | 1,000 |
| Combined values of cement, clay (bentonite and common), copper, garnet (industrial), gold, iodine, lime, molybdenum concentrates, rhenium, silver, talc (crude) | XX | 584,000 ^r | XX | 566,000 ^r | XX | 484,000 |
| Total | XX | 1,190,000 ^r | XX | 1,170,000 ^r | XX | 1,010,000 |
| Nebraska: | | | | | | |
| Gemstones, natural ^e | NA | 4 | NA | 4 | NA | 5 |
| Sand and gravel, construction | 12,700 ^r | 88,700 ^r | 12,100 ^r | 86,700 ^r | 12,600 | 90,100 |
| Stone, crushed | 6,560 ^r | 73,700 ^r | 7,440 ^r | 90,500 ^r | 7,650 | 94,800 |
| Combined values of cement, clay (common), lime, sand and gravel (industrial) | XX | (7) | XX | (7) | XX | (7) |
| Total | XX | 162,000 ^r | XX | 177,000 ^r | XX | 185,000 |
| Nevada: | | | | | | |
| Barite | 717 | 80,500 | 649 | 85,800 | 410 | 53,400 |
| Gold ⁴ kilograms | 170,000 | 7,720,000 | 151,000 | 6,160,000 | 162,000 | 6,050,000 |
| Lithium carbonate metric tons | 870 ¹² | 11,200 | (6) | W | (6) | W |
| Sand and gravel, construction | 12,700 | 87,800 | 13,600 ^r | 87,900 ^r | 15,400 | 89,700 |
| Silver ⁴ kilograms | 255,000 | 195,000 | 326,000 | 203,000 | 290,000 | 147,000 |
| Stone, crushed | 7,840 | 74,900 | 8,630 ^r | 76,900 ^r | 8,530 | 80,500 |
| Combined values of cement, clay [bentonite, fuller's earth (2013–14), kaolin], copper, diatomite, gemstones (natural), gypsum (crude), lime, magnesite, molybdenum concentrates, perlite (crude), salt, sand and gravel (industrial), stone (dimension), and values indicated by symbol W | XX | 1,020,000 ^r | XX | 904,000 ^r | XX | 845,000 |
| Total | XX | 9,190,000 ^r | XX | 7,510,000 ^r | XX | 7,260,000 |
| New Hampshire: | | | | | | |
| Gemstones, natural ^e | NA | 7 | NA | 7 | NA | 8 |
| Sand and gravel, construction | 6,250 ^r | 47,100 ^r | 6,360 ^r | 53,600 ^r | 6,280 | 52,500 |
| Stone: | | | | | | |
| Crushed | 4,890 | 43,300 | 5,180 ^r | 44,800 ^r | 5,550 | 51,500 |
| Dimension | 34 | 4,510 | 28 | 3,460 | (6) | (7) |
| Total | XX | 95,000 ^r | XX | 102,000 ^r | XX | 104,000 |
| New Jersey: | | | | | | |
| Gemstones, natural ^e | NA | 1 | NA | 1 | NA | 2 |
| Peat | (6) | (13) | (6) | (13) | (6) | (13) |
| Sand and gravel: | | | | | | |
| Construction | 11,000 | 94,000 | 12,100 | 93,300 ^r | 11,400 | 89,900 |
| Industrial | 882 | 28,200 | 961 | 37,200 | 950 | 35,500 |
| Stone, crushed | 17,200 | 144,000 | 16,900 | 154,000 | 17,300 | 153,000 |
| Total | XX | 266,000 | XX | 284,000 ^r | XX | 278,000 |
| New Mexico: | | | | | | |
| Copper ^{4,14} metric tons | 121,000 | 908,000 | 156,000 | 1,090,000 | 181,000 | 1,020,000 |
| Gemstones, natural ^e | NA | 17 | NA | 18 | NA | 47 |
| Sand and gravel, construction | 9,380 ^r | 84,200 ^r | 8,290 ^r | 84,500 ^r | 9,320 | 84,800 |
| Stone, crushed | 5,040 | 46,900 | 5,050 ^r | 45,100 ^r | 5,530 | 49,500 |

See footnotes at end of table.

TABLE 5—Continued
NONFUEL MINERAL PRODUCTION IN THE UNITED STATES, BY STATE^{1, 2, 3}

(Thousand metric tons and thousand dollars unless otherwise specified)

| Commodity | 2013 | | 2014 | | 2015 | |
|---|---------------------|------------------------|---------------------|------------------------|----------|----------------------|
| | Quantity | Value | Quantity | Value | Quantity | Value |
| New Mexico:—Continued | | | | | | |
| Combined values of cement, clay (common), gold, gypsum (crude), molybdenum concentrates (2013–14), perlite (crude), potash, pumice and pumicite, rhenium, salt, silver, stone (dimension), zeolites | XX | 506,000 ^r | XX | 537,000 ^r | XX | 472,000 |
| Total | XX | 1,540,000 ^r | XX | 1,760,000 ^r | XX | 1,630,000 |
| New York: | | | | | | |
| Clay, common | 548 | 24,900 | 512 ^r | 24,000 ^r | 528 | 25,400 |
| Gemstones, natural ^e | NA | 99 | NA | 104 | NA | 94 |
| Salt | 7,120 | 502,000 | 7,740 | 577,000 | 7,320 | 615,000 |
| Sand and gravel, construction | 28,900 ^r | 251,000 ^r | 27,600 ^r | 252,000 ^r | 30,300 | 290,000 |
| Stone: | | | | | | |
| Crushed | 34,500 ^r | 353,000 ^r | 36,800 ^r | 414,000 ^r | 40,300 | 478,000 |
| Dimension | 120 | 17,300 | 126 | 17,600 | 126 | 17,200 |
| Combined values of cement, garnet (industrial), peat, sand and gravel (industrial), wollastonite | XX | (7) | XX | (7) | XX | (7) |
| Total | XX | 1,150,000 | XX | 1,290,000 ^r | XX | 1,430,000 |
| North Carolina: | | | | | | |
| Clay, common | 727 | 20,000 | 799 | 17,500 | 923 | 26,700 |
| Gemstones, natural ^e | NA | 371 | NA | 235 | NA | 299 |
| Sand and gravel: | | | | | | |
| Construction | 7,390 | 49,900 | 7,350 ^r | 48,600 ^r | 7,940 | 52,300 |
| Industrial | 1,290 | 30,700 | 2,640 ^r | 41,500 ^r | 4,050 | 55,100 |
| Stone: | | | | | | |
| Crushed | 46,600 | 715,000 | 46,200 | 727,000 | 49,800 | 783,000 |
| Dimension | 47 | 19,600 | 44 | 20,700 | 91 | 18,600 |
| Combined values of andalusite, clay [kaolin (2013–14)], feldspar, mica (crude), phosphate rock, pyrophyllite (crude) | XX | (7) | XX | (7) | XX | (7) |
| Total | XX | 836,000 ^r | XX | 856,000 ^r | XX | 936,000 |
| North Dakota: | | | | | | |
| Clay, common | (6) | (7) | (6) | (7) | (6) | (7) |
| Gemstones, natural ^e | NA | 4 | NA | 4 | NA | 5 |
| Lime | (6) | (7) | (6) | (7) | (6) | (7) |
| Sand and gravel: | | | | | | |
| Construction | 25,900 ^r | 187,000 ^r | 20,600 ^r | 147,000 ^r | 18,100 | 116,000 |
| Industrial | (6) | (7) | (6) | (7) | (6) | (7) |
| Stone, crushed | 998 ^r | 11,700 ^r | 1,130 ^r | 12,000 ^r | 776 | 5,640 |
| Total | XX | 198,000 ^r | XX | 159,000 ^r | XX | 122,000 |
| Ohio: | | | | | | |
| Cement, portland | 829 | 79,000 ^e | 864 | 90,000 ^e | 916 | 104,000 ^e |
| Clay, common | 602 | 9,100 | 643 | 9,980 | 653 | 10,600 |
| Gemstones, natural ^e | NA | 4 | NA | 4 | NA | 5 |
| Lime | 1,780 | 229,000 | 1,800 | 234,000 | 1,500 | 201,000 |
| Sand and gravel: | | | | | | |
| Construction | 28,900 ^r | 225,000 ^r | 30,500 ^r | 228,000 ^r | 33,300 | 274,000 |
| Industrial | 1,230 | 61,100 | 2,850 | 211,000 | 1,440 | 79,400 |
| Stone: | | | | | | |
| Crushed | 52,900 | 433,000 | 53,500 ^r | 477,000 ^r | 58,700 | 525,000 |
| Dimension | 27 | 6,610 | 21 | 5,150 | 22 | 6,070 |
| Combined values of cement (masonry), clay [fire (2015)], peat, salt | XX | (7) | XX | (7) | XX | (7) |
| Total | XX | 1,040,000 | XX | 1,250,000 ^r | XX | 1,200,000 |
| Oklahoma: | | | | | | |
| Clay, common | 925 | 3,160 | 906 | 2,760 ^r | 948 | 2,850 |
| Gemstones, natural ^e | NA | 4 | NA | 4 | NA | 5 |

See footnotes at end of table.

TABLE 5—Continued
NONFUEL MINERAL PRODUCTION IN THE UNITED STATES, BY STATE^{1,2,3}

(Thousand metric tons and thousand dollars unless otherwise specified)

| Commodity | 2013 | | 2014 | | 2015 | |
|--|---------------------|------------------------|---------------------|------------------------|----------|----------------------|
| | Quantity | Value | Quantity | Value | Quantity | Value |
| Oklahoma:—Continued | | | | | | |
| Sand and gravel: | | | | | | |
| Construction | 10,900 ^r | 74,500 ^r | 11,800 ^r | 89,400 ^r | 11,500 | 95,600 |
| Industrial | 2,120 | 89,100 | 3,340 | 122,000 | 3,100 | 73,100 |
| Stone: | | | | | | |
| Crushed | 39,800 | 304,000 | 39,500 ^r | 321,000 ^r | 37,400 | 328,000 |
| Dimension | 43 | 7,880 | 62 | 5,240 | 67 | 5,920 |
| Combined values of cement, feldspar, gypsum (crude), helium [crude (2015) and Grade-A (2013–15)], iodine (crude), lime, pumice and pumicite (2013–14), salt | | | | | | |
| | XX | 245,000 ^r | XX | 286,000 ^r | XX | 274,000 |
| Total | XX | 724,000 ^r | XX | 827,000 ^r | XX | 780,000 |
| Oregon: | | | | | | |
| Gemstones, natural ^e | NA | 1,100 | NA | 1,090 | NA | 1,180 |
| Sand and gravel, construction | 11,300 | 90,700 | 11,000 ^r | 94,000 ^r | 12,500 | 109,000 |
| Stone, crushed | 16,700 ^r | 131,000 ^r | 17,600 ^r | 135,000 ^r | 17,800 | 129,000 |
| Combined values of cement, clay (bentonite and common), diatomite, emery [crude (2013–14)], lime, perlite (crude), pumice and pumicite, sand and gravel [industrial (2014–15)], zeolites | | | | | | |
| | XX | 118,000 | XX | 133,000 | XX | 154,000 |
| Total | XX | 341,000 ^r | XX | 364,000 ^r | XX | 394,000 |
| Pennsylvania: | | | | | | |
| Cement: | | | | | | |
| Masonry | 143 | 20,500 ^{r,e} | 152 ^r | 22,100 ^{r,e} | 179 | 26,600 ^e |
| Portland | 3,620 | 353,000 ^e | 3,830 | 352,000 ^e | 3,920 | 396,000 ^e |
| Clay, common | 236 | 2,150 | 229 | 2,070 | 237 | 2,220 |
| Gemstones, natural ^e | NA | 1 | NA | 1 | NA | 2 |
| Lime | 1,090 | 151,000 | 1,080 | 148,000 | 968 | 132,000 |
| Peat | (6) | (7) | (6) | (7) | (6) | (7) |
| Sand and gravel: | | | | | | |
| Construction | 10,500 | 94,800 | 9,730 ^r | 95,100 ^r | 10,300 | 111,000 |
| Industrial | (6) | (7) | (6) | (7) | (6) | (7) |
| Stone: | | | | | | |
| Crushed | 78,800 | 888,000 | 82,200 ^r | 1,010,000 ^r | 89,000 | 1,170,000 |
| Dimension | 25 | 5,890 | 51 | 5,720 | 42 | 6,410 |
| Total | XX | 1,520,000 ^r | XX | 1,630,000 ^r | XX | 1,850,000 |
| Rhode Island: | | | | | | |
| Gemstones, natural ^e | NA | 1 | NA | 1 | NA | 2 |
| Sand and gravel: | | | | | | |
| Construction | 2,410 | 30,000 | 2,830 ^r | 32,800 ^r | 2,360 | 28,200 |
| Industrial | (6) | (7) | (6) | (7) | (6) | (7) |
| Stone, crushed | 1,640 | 17,600 | 1,960 ^r | 21,200 ^r | 2,350 | 25,200 |
| Total | XX | 47,600 | XX | 54,100 ^r | XX | 53,400 |
| South Carolina: | | | | | | |
| Cement: | | | | | | |
| Masonry | 155 | 22,000 ^e | 160 | 23,700 ^e | 168 | 26,000 ^e |
| Portland | 2,780 | 236,000 ^e | 2,890 | 273,000 ^e | 3,070 | 318,000 ^e |
| Clay: | | | | | | |
| Common | (6) | (7) | (6) | (7) | (6) | (7) |
| Kaolin | 313 | 27,100 | 345 | 30,200 | 354 | 31,500 |
| Gemstones, natural ^e | NA | 1 | NA | 1 | NA | 2 |
| Sand and gravel: | | | | | | |
| Construction | 6,510 | 37,300 | 8,080 | 42,000 ^r | 8,770 | 47,600 |
| Industrial | 521 | 23,600 | 589 | 26,800 | 551 | 24,400 |

See footnotes at end of table.

TABLE 5—Continued
NONFUEL MINERAL PRODUCTION IN THE UNITED STATES, BY STATE^{1,2,3}

(Thousand metric tons and thousand dollars unless otherwise specified)

| Commodity | 2013 | | 2014 | | 2015 | | |
|--|----------------------|----------------------|----------------------|------------------------|----------------------|------------------------|---------|
| | Quantity | Value | Quantity | Value | Quantity | Value | |
| South Carolina:—Continued | | | | | | | |
| Stone: | | | | | | | |
| Crushed | 20,000 | 207,000 | 20,300 ^r | 219,000 ^r | 23,800 | 273,000 | |
| Dimension | (6) | (7) | (6) | (7) | (6) | (7) | |
| Vermiculite | (6) | (7) | (6) | (7) | (6) | (7) | |
| Total | XX | 553,000 | XX | 614,000 ^r | XX | 721,000 | |
| South Dakota: | | | | | | | |
| Sand and gravel, construction | 11,800 | 53,000 | 11,900 ^r | 59,100 ^r | 11,100 | 54,100 | |
| Stone, crushed | 6,300 | 44,700 | 6,900 ^r | 52,000 ^r | 6,580 | 47,600 | |
| Combined values of cement, clay (common), feldspar, gemstones (natural), gold, gypsum (crude), lime, mica (crude), sand and gravel (industrial), silver, stone (dimension) | XX | 187,000 | XX | 221,000 | XX | 226,000 | |
| Total | XX | 285,000 | XX | 333,000 ^r | XX | 328,000 | |
| Tennessee: | | | | | | | |
| Clay, ball | 623 | 28,500 | 648 | 27,400 | 601 | 27,900 | |
| Sand and gravel: | | | | | | | |
| Construction | 6,060 | 48,300 | 5,790 ^r | 41,000 ^r | 6,460 | 50,500 | |
| Industrial | 1,090 | 35,600 | 1,490 | 60,500 | 1,540 | 49,100 | |
| Stone: | | | | | | | |
| Crushed | 37,100 ^r | 464,000 ^r | 38,200 ^r | 483,000 ^r | 40,100 | 511,000 | |
| Dimension | 32 | 6,140 | 51 | 11,000 | 52 | 10,200 | |
| Combined values of cadmium, cement, clay (common and fuller's earth), gemstones (natural), lime, salt, zinc | XX | 378,000 | XX | 407,000 | XX | 398,000 | |
| Total | XX | 961,000 ^r | XX | 1,030,000 ^r | XX | 1,050,000 | |
| Texas: | | | | | | | |
| Cement: | | | | | | | |
| Masonry | 238 | 37,300 ^e | 277 | 43,300 ^e | 268 | 46,200 ^e | |
| Portland | 10,100 | 995,000 ^e | 11,000 | 1,170,000 ^e | 10,400 | 1,200,000 ^e | |
| Clay: | | | | | | | |
| Bentonite | 56 ^r | 9,990 | 59 | 10,400 | 51 | 8,570 | |
| Common | 1,520 | 12,100 | 1,740 | 14,400 | 2,100 | 39,400 | |
| Gemstones, natural ^e | NA | 172 | NA | 170 | NA | 180 | |
| Lime | 1,360 | 154,000 | 1,490 | 171,000 | 1,460 | 170,000 | |
| Salt | 7,770 | 166,000 | 8,010 | 182,000 | 7,570 | 173,000 | |
| Sand and gravel: | | | | | | | |
| Construction | 77,300 ^r | 625,000 ^r | 77,100 ^r | 693,000 ^r | 83,700 | 790,000 | |
| Industrial | 7,080 | 434,000 | 16,500 | 1,300,000 | 14,200 | 706,000 | |
| Stone: | | | | | | | |
| Crushed | 135,000 ^r | 1,080,000 | 154,000 ^r | 1,340,000 ^r | 162,000 | 1,610,000 | |
| Dimension | 905 | 151,000 | 922 | 159,000 | 1,060 | 142,000 | |
| Combined values of clay (ball, fire, fuller's earth, kaolin), gypsum (crude), helium (crude), iodine [crude (2015)], talc, (crude), zeolites | XX | 57,800 | XX | 58,000 | XX | 66,700 | |
| Total | XX | 3,720,000 | XX | 5,150,000 ^r | XX | 4,950,000 | |
| Utah: | | | | | | | |
| Beryllium ⁸ | metric tons | 235 | W | 270 | W | 205 | W |
| Gemstones, natural ^e | | NA | 857 | NA | 860 | NA | 174 |
| Iron ore | | 1,270 | 103,000 | 998 | 83,000 | -- | -- |
| Salt | | 2,040 | 157,000 | 2,360 | 157,000 ^r | 2,010 | 159,000 |
| Sand and gravel, construction | | 25,200 ^r | 181,000 | 25,500 ^r | 191,000 ^r | 29,300 | 220,000 |
| Stone: | | | | | | | |
| Crushed | | 7,260 | 59,300 | 8,290 ^r | 65,300 ^r | 8,200 | 57,800 |
| Dimension | | (6) | W | (6) | W | 6 | 620 |
| Vanadium ⁴ | metric tons | 591 | 7,870 | -- | -- | -- | -- |

See footnotes at end of table.

TABLE 5—Continued
NONFUEL MINERAL PRODUCTION IN THE UNITED STATES, BY STATE^{1,2,3}

(Thousand metric tons and thousand dollars unless otherwise specified)

| Commodity | 2013 | | 2014 | | 2015 | |
|---|----------------------|------------------------|---------------------|------------------------|----------|---------------------|
| | Quantity | Value | Quantity | Value | Quantity | Value |
| Utah:—Continued | | | | | | |
| Combined values of cement, clay (bentonite and common), copper, gold, gypsum (crude), helium [crude (2015) and Grade-A (2015)], iron oxide pigments (2014–15), lime, magnesium compounds, magnesium metal, molybdenum concentrates, phosphate rock, potash, rhenium, silver, and values indicated by symbol W | XX | 2,910,000 ^r | XX | 3,000,000 ^r | XX | 1,690,000 |
| Total | XX | 3,420,000 ^r | XX | 3,490,000 ^r | XX | 2,120,000 |
| Vermont: | | | | | | |
| Gemstones, natural ^e | NA | 1 | NA | 1 | NA | 2 |
| Sand and gravel, construction | 4,890 ^r | 36,500 ^r | 4,790 ^r | 32,800 ^r | 4,960 | 36,000 |
| Stone: | | | | | | |
| Crushed | 6,490 ^r | 64,100 | 6,500 ^r | 65,200 ^r | 6,740 | 69,100 |
| Dimension | 80 | 25,200 ^r | 92 | 24,100 | 87 | 27,900 |
| Talc, crude | (6) | (7) | (6) | (7) | (6) | (7) |
| Total | XX | 126,000 | XX | 122,000 ^r | XX | 133,000 |
| Virginia: | | | | | | |
| Kyanite metric tons | 110,000 ^r | 38,000 ^{r,e} | 89,000 ^r | 29,000 ^{r,e} | 108,000 | 37,000 ^e |
| Sand and gravel, construction | 6,820 | 75,000 | 7,110 ^r | 80,400 ^r | 7,660 | 81,400 |
| Stone: | | | | | | |
| Crushed | 54,700 ^r | 819,000 ^r | 44,200 ^r | 686,000 ^r | 46,400 | 748,000 |
| Dimension | 12 | 7,590 | 13 | 7,730 | 12 | 7,690 |
| Combined values of cement, clay (common and fuller's earth), feldspar, gemstones (natural), iron oxide pigments [crude (2013)], lime, mica (crude), salt, sand and gravel (industrial), staurolite (2015), talc [crude (2013–14)], titanium mineral concentrates (ilmenite), vermiculite (crude), zirconium mineral concentrates (zircon) | XX | 325,000 | XX | 285,000 | XX | 334,000 |
| Total | XX | 1,260,000 ^r | XX | 1,090,000 ^r | XX | 1,210,000 |
| Washington: | | | | | | |
| Gemstones, natural ^e | NA | 58 | NA | 59 | NA | 99 |
| Sand and gravel, construction | 31,100 ^r | 235,000 ^r | 32,000 ^r | 238,000 ^r | 33,300 | 271,000 |
| Stone, crushed | 14,300 ^r | 184,000 ^r | 13,700 ^r | 179,000 ^r | 14,500 | 212,000 |
| Combined values of cement, clay [common (2015) and fire (2013–14)], diatomite, gold, lead (2014–15), lime, peat, sand and gravel (industrial), stone [dimension (2015)], zinc (2014–15) | XX | 328,000 | XX | 284,000 | XX | 319,000 |
| Total | XX | 747,000 ^r | XX | 702,000 ^r | XX | 801,000 |
| West Virginia: | | | | | | |
| Gemstones, natural ^e | NA | 1 | NA | 1 | NA | 2 |
| Sand and gravel: | | | | | | |
| Construction | 487 | 4,130 | 618 | 5,240 | 583 | 4,950 |
| Industrial | 429 | 21,900 | 536 | 29,500 | 681 | 37,500 |
| Stone, crushed | 14,800 | 156,000 | 14,900 | 168,000 | 15,000 | 165,000 |
| Combined values of cement, clay (common), lime, salt | XX | (7) | XX | (7) | XX | (7) |
| Total | XX | 182,000 | XX | 202,000 | XX | 208,000 |
| Wisconsin: | | | | | | |
| Gemstones, natural ^e | NA | 7 | NA | 7 | NA | 8 |
| Lime | (6) | (7) | (6) | (7) | (6) | (7) |
| Sand and gravel: | | | | | | |
| Construction | 24,900 ^r | 129,000 ^r | 26,300 ^r | 149,000 ^r | 28,000 | 168,000 |
| Industrial | 19,800 | 1,210,000 | 38,300 | 3,150,000 | 32,200 | 1,390,000 |
| Stone: | | | | | | |
| Crushed | 20,300 | 129,000 | 21,600 ^r | 149,000 ^r | 22,500 | 168,000 |
| Dimension | 156 | 37,200 | 190 | 40,200 | 199 | 41,200 |
| Total | XX | 1,510,000 ^r | XX | 3,490,000 ^r | XX | 1,770,000 |

See footnotes at end of table.

TABLE 5—Continued
NONFUEL MINERAL PRODUCTION IN THE UNITED STATES, BY STATE^{1,2,3}

(Thousand metric tons and thousand dollars unless otherwise specified)

| Commodity | 2013 | | 2014 | | 2015 | |
|--|---------------------|------------------------|---------------------|------------------------|----------|-----------|
| | Quantity | Value | Quantity | Value | Quantity | Value |
| Wyoming: | | | | | | |
| Clay, bentonite | 4,000 | 253,000 | 4,340 | 289,000 | 3,570 | 253,000 |
| Gemstones, natural ^e | NA | 18 | NA | 18 | NA | 18 |
| Sand and gravel, construction | 11,700 ^r | 94,300 ^r | 13,700 ^r | 118,000 ^r | 15,000 | 134,000 |
| Stone, crushed | 9,640 ^r | 42,700 ^r | 11,300 ^r | 48,000 ^r | 18,400 | 52,800 |
| Combined values of cement, clay (common), gypsum (crude), helium (Grade-A), lime, soda ash | XX | 1,840,000 ^r | XX | 2,050,000 ^r | XX | 2,040,000 |
| Total | XX | 2,230,000 ^r | XX | 2,510,000 ^r | XX | 2,480,000 |
| Undistributed: | | | | | | |
| Combined values of Connecticut, Delaware, Illinois, Iowa (2014–15), Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Minnesota, Mississippi, Nebraska, New Hampshire (2015), New York, North Carolina, North Dakota, Ohio, Pennsylvania, Rhode Island, South Carolina, Vermont, West Virginia, Wisconsin | XX | 2,740,000 ^r | XX | 3,210,000 | XX | 2,950,000 |

^eEstimated. ^rRevised. do. Ditto. NA Not available. W Withheld to avoid disclosing company proprietary data; included in “Combined values” data for each State. XX Not applicable. -- Zero.

¹Includes data available through June 2018.

²Production as measured by mine shipments, sales, or marketable production (including consumption by producers). Mine output as measured as sold or used by producers in a given year is primarily shown in the tables, because values can be assigned. Where sold or used data are not available, actual mine output is used as the production measurement and value is estimated on the basis of the average price of the mineral commodity for that year.

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

⁴Recoverable content of ores and concentrates. The values assigned to the quantities are based on the average selling price of refined metal, not the value of the mined material, except for molybdenum and vanadium where the value is based on the metal oxide content.

⁵Rare-earth-oxide (REO) basis.

⁶Withheld to avoid disclosing company proprietary data.

⁷Withheld to avoid disclosing company proprietary data; value included in “Undistributed.”

⁸Content of concentrates.

⁹Source: Lundin Mining Corp., 2016, Management’s Discussion and Analysis for the year ended December 31, 2015: Toronto, Ontario, Canada, Lundin Mining Corp., 106 p. (Accessed May 21, 2018, at https://www.lundinmining.com/site/assets/files/3758/2015_af.pdf.)

¹⁰Production based on publicly available data; refer to the Minerals Yearbook iron ore chapter.

¹¹Recoverable content of nickel sulfide concentrates.

¹²Contained lithium.

¹³Withheld to avoid disclosing company proprietary data; included in “Total.”

¹⁴Production based on publicly available data; refer to the Freeport-McMoRan Copper & Gold Inc., 2016, Form 10-K—2015: U.S. Securities and Exchange Commission, 551 p. (Accessed June 22, 2016, at <http://d11ge852tjjqow.cloudfront.net/CIK-0000831259/78231b00-1269-4bd9-84a0-ff9732e28be3.pdf>.)

TABLE 6
NONFUEL RAW MINERAL PRODUCTION IN THE COMMONWEALTH OF PUERTO RICO^{1,2,3,4}

(Thousand metric tons and thousand dollars)

| Commodity | 2013 | | 2014 | | 2015 | |
|---------------------------|----------|---------------------|--------------------|---------------------|----------|--------|
| | Quantity | Value | Quantity | Value | Quantity | Value |
| Cement: | | | | | | |
| Masonry | (5) | W | -- | -- | -- | -- |
| Portland | 610 | W | 588 | W | 536 | W |
| Clay, common ^e | 58 | 320 | 58 | 320 | 61 | 335 |
| Lime | (6) | W | (6) | W | (6) | W |
| Salt ^e | 45 | 1,500 | 45 | 1,720 | 46 | 1,790 |
| Stone, crushed | 5,990 | 61,000 | 6,070 ^r | 56,600 ^r | 5,150 | 46,900 |
| Total | XX | 62,800 ^r | XX | 58,600 ^r | XX | 49,000 |

^eEstimated. ^rRevised. W Withheld to avoid disclosing company proprietary data; excluded from "Total." XX Not applicable. -- Zero.

¹Includes data available through June 2018.

²Production as measured by mine shipments, sales, or marketable production (including consumption by producers). Mine output as measured as sold or used by the producers in a given year is primarily shown in the tables, because values can be assigned. Where sold or used data are not available, actual mine output is used as the production measurement and value is estimated on the basis of the average price of the mineral commodity for that year.

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

⁴Data for crushed stone from the Administered Islands American Samoa, Guam, and the Virgin Islands are not included because these data are withheld to avoid disclosing company proprietary data.

⁵Less than 1/2 unit.

⁶Withheld to avoid disclosing company proprietary data.

TABLE 7
U.S. EXPORTS OF PRINCIPAL MINERALS AND PRODUCTS, EXCLUDING MINERAL FUELS^{1,2}

(Thousand metric tons and thousand dollars unless otherwise specified)

| Commodity | 2014 | | 2015 | | |
|--|-------------|----------------------|-------------------------|-----------|------------|
| | Quantity | Value | Quantity | Value | |
| Metals: | | | | | |
| Aluminum: | | | | | |
| Crude and semicrude | metric tons | 3,230,000 | 9,200,000 | 3,010,000 | 8,450,000 |
| Manufactures | do. | 110,000 | 484,000 | 105,000 | 454,000 |
| Antimony: | | | | | |
| Metal, alloys, waste and scrap | do. | 1,570 | 5,930 ^r | 1,440 | 5,740 |
| Oxide, Sb content | do. | 1,670 | 11,100 ^r | 1,760 | 12,000 |
| Arsenic metal, As content | do. | 2,970 ^r | NA | 1,670 | NA |
| Bauxite and alumina: | | | | | |
| Alumina, calcined equivalent | | 2,130 | 961,000 | 2,220 | 918,000 |
| Bauxite: | | | | | |
| Calcined, refractory and other grade | | 8 | 1,740 | 10 | 1,740 |
| Crude and dried | | 3 | NA | 4 | NA |
| Beryllium, unwrought, waste and scrap, other including articles not elsewhere specified, Be content | | | | | |
| | kilograms | 26,400 | 21,000 | 28,900 | 15,300 |
| Bismuth, metal, alloys, waste and scrap, Bi content | do. | 567,000 | 6,300 | 519,000 | 5,350 |
| Cadmium: | | | | | |
| Sulfide, gross weight | do. | 3,000 | 712 | 3,740 | 829 |
| Unwrought metal and powders | do. | 198,000 | 509 | 350,000 | 783 |
| Waste and scrap | do. | -- | -- | 147 | 3 |
| Chromium: | | | | | |
| Ores and concentrate | metric tons | 6,060 | 4,150 | 7,210 | 5,680 |
| Metals and alloys: | | | | | |
| Metal, unwrought powders, waste and scrap, other | do. | 665 ^r | 17,800 ^r | 801 | 15,700 |
| Ferroalloys, high-carbon, low-carbon, ferrochromium-silicon | do. | 4,730 | 8,060 | 1,080 | 1,820 |
| Chemicals: | | | | | |
| Oxides, trioxide, other | do. | 19,800 | 91,400 ^r | 5,200 | 26,500 |
| Sulfates | do. | 207 | 1,100 | 238 | 1,230 |
| Salts of oxometallic or peroxometallic acids, zinc and lead chromate, sodium dichromate, potassium dichromate, other | do. | 13,800 | 27,200 | 405 | 2,760 |
| Pigments and preparations | do. | 432 ^r | 3,180 ^r | 521 | 3,640 |
| Cobalt: | | | | | |
| Acetates | do. | 181 | 3,380 | 180 | 1,390 |
| Chlorides | do. | 3 | 44 | (3) | 7 |
| Oxides and hydroxides | do. | 536 | 5,720 | 192 | 2,690 |
| Metal, unwrought, powders, waste and scrap, mattes, other intermediate products of metallurgy | do. | 4,070 | 102,000 | 3,640 | 87,000 |
| Copper: | | | | | |
| Unmanufactured, does not include unalloyed scrap, Cu content | do. | 571,000 | 3,910,000 ^r | 506,000 | 3,430,000 |
| Semimanufactures | do. | 247,000 | 1,980,000 | 250,000 | 1,800,000 |
| Scrap, unalloyed | do. | 430,000 | 1,920,000 ^r | 426,000 | 1,610,000 |
| Ferroalloys not listed elsewhere: | | | | | |
| Ferrophosphorus | do. | 544 | 993 | 976 | 1,760 |
| Other | do. | 7,390 | 15,700 | 3,380 | 9,530 |
| Gold: | | | | | |
| Ores and concentrates | kilograms | 4,350 ^r | 178,000 | 5,280 | 193,000 |
| Dore and precipitates | do. | 120,000 ^r | 4,880,000 ^r | 123,000 | 4,710,000 |
| Bullion, refined | do. | 387,000 ^r | 15,600,000 ^r | 366,000 | 13,800,000 |
| Waste and scrap | do. | 149,000 ^r | 814,000 ^r | 372,000 | 1,440,000 |
| Metal powder | do. | 1,220 ^r | 46,300 ^r | 542 | 10,600 |
| Compounds | do. | 13,000 ^r | 102,000 ^r | 12,800 | 94,400 |
| Iron and steel: | | | | | |
| Steel mill products | | 10,900 | NA | 9,050 | NA |
| Fabricated steel products | | 2,060 | NA | 1,870 | NA |
| Cast iron and steel products | | 342 | NA | 221 | NA |

See footnotes at end of table.

TABLE 7—Continued
 U.S. EXPORTS OF PRINCIPAL MINERALS AND PRODUCTS, EXCLUDING MINERAL FUELS^{1,2}

(Thousand metric tons and thousand dollars unless otherwise specified)

| Commodity | 2014 | | 2015 | |
|---|----------------------|------------------------|-----------|-----------|
| | Quantity | Value | Quantity | Value |
| Metals:—Continued | | | | |
| Iron and steel scrap: | | | | |
| Ferrous, includes tinplate and terneplate, excludes used rails for rerolling and other uses and ships, boats, and other vessels for scrapping | 15,300 | 6,150,000 ^r | 12,800 | 4,010,000 |
| Pig iron, all grades metric tons | 6,770 | 2,290 | 17,300 | 5,450 |
| Direct-reduced iron, steelmaking grade do. | 1,110 | 132 | 20,200 | 549 |
| Ships, boats, and other vessels for scrapping | 7 | 1,300 | 4 | 641 |
| Used rails for rerolling and other uses, includes mixed (used plus new) rails | 41 | 38,100 | 35 | 45,300 |
| Iron ore | 12,100 | 1,320,000 | 7,540 | 612,000 |
| Lead: | | | | |
| Base bullion, Pb content metric tons | 964 | 2,830 | 596 | 1,470 |
| Ore and concentrates, Pb content do. | 356,000 | 582,000 | 349,000 | 467,000 |
| Unwrought and alloys, Pb content do. | 55,300 | 63,800 | 55,900 | 54,000 |
| Wrought and alloys, Pb content do. | 5,020 | 10,100 | 2,880 | 10,100 |
| Scrap, gross weight do. | 36,400 | 51,300 | 46,200 | 57,000 |
| Magnesium, gross weight: | | | | |
| Waste and scrap do. | 922 ^r | 2,460 | 433 | 895 |
| Metal do. | 6,020 ^r | 22,000 ^r | 5,220 | 18,300 |
| Alloys do. | 8,150 ^r | 32,000 ^r | 7,490 | 27,200 |
| Powder, sheets, tubing, ribbons, wire, other forms do. | 1,910 ^r | 57,900 ^r | 2,060 | 71,700 |
| Manganese, gross weight: | | | | |
| Ores and concentrates with 20% or more manganese do. | 858 | 2,250 | 700 | 1,550 |
| Ferromanganese, all grades do. | 5,530 ^r | 8,580 ^r | 5,140 | 5,630 |
| Silicomanganese do. | 3,320 | 3,820 | 1,220 | 1,340 |
| Metal, including alloys and waste and scrap do. | 3,610 ^r | 7,350 ^r | 5,390 | 7,660 |
| Dioxide do. | 3,800 ^r | 7,870 | 3,270 | 7,940 |
| Mercury: | | | | |
| Metal kilograms | -- | -- | 30 | 3 |
| Amalgams of precious metals whether or not chemically defined metric tons | 108 ^r | 474,000 | 99 | 375,000 |
| Molybdenum: | | | | |
| Ore and concentrates, including roasted and other, Mo content do. | 60,500 | 1,240,000 | 36,800 | 587,000 |
| Chemicals, gross weight: | | | | |
| Oxides and hydroxides do. | 1,740 | 33,500 | 1,300 | 22,300 |
| Molybdates, all do. | 1,600 | 22,100 ^r | 2,020 | 22,300 |
| Ferromolybdenum, Mo content do. | 592 ^r | 18,400 | 569 | 15,100 |
| Other, includes powders, unwrought, bars and rods, waste and scrap, wire, other, gross weight do. | 1,320 | 97,700 ^r | 1,180 | 77,900 |
| Nickel: | | | | |
| Primary, unwrought and chemicals, Ni content do. | 10,400 | 465,000 ^r | 9,580 | 414,000 |
| Secondary, stainless steel scrap and waste and scrap, Ni content do. | 56,300 ^r | 799,000 | 51,900 | 747,000 |
| Wrought, not alloyed, bars, rods, profiles, wire, sheets, strip, foil, tubes, pipes, Ni content do. | 680 | 23,900 | 526 | 21,400 |
| Alloyed, unwrought ingot, bars, rods, profiles, wire, sheets, strip, foil, tubes, pipes, other alloyed articles, gross weight do. | 45,200 | 1,810,000 | 46,500 | 1,810,000 |
| Niobium (columbium) and tantalum, gross quantity: | | | | |
| Niobium: | | | | |
| Ores and concentrates kilograms | 59,600 | 772 | 73,400 | 557 |
| Ferroniobium do. | 1,620,000 | 22,900 | 2,140,000 | 26,300 |
| Tantalum: | | | | |
| Ores and concentrates, includes synthetic do. | XX | 11,300 ^r | XX | 8,130 |
| Unwrought powders do. | 206,000 | 100,000 | 230,000 | 84,600 |
| Unwrought, alloys and metal do. | 40,200 | 9,740 | 5,300 | 2,140 |
| Waste and scrap do. | 285,000 ^r | 46,300 ^r | 280,000 | 42,700 |
| Wrought do. | 56,900 | 36,100 | 57,300 | 36,200 |

See footnotes at end of table.

TABLE 7—Continued
U.S. EXPORTS OF PRINCIPAL MINERALS AND PRODUCTS, EXCLUDING MINERAL FUELS^{1,2}

(Thousand metric tons and thousand dollars unless otherwise specified)

| Commodity | 2014 | | 2015 | | |
|--|-------------|-------------------------|------------------------|------------|-----------|
| | Quantity | Value | Quantity | Value | |
| Metals:—Continued | | | | | |
| Platinum-group metals: | | | | | |
| Palladium, Pd content | kilograms | 22,500 | 460,000 | 23,000 | 458,000 |
| Platinum, includes waste and scrap and metal, Pt content | do. | 269,000 | 1,660,000 | 261,000 | 1,360,000 |
| Iridium, osmium, ruthenium, gross weight | do. | 901 | 13,200 | 782 | 13,800 |
| Rhodium, Rh content | do. | 428 | 17,000 | 759 | 25,800 |
| Rare earths, estimated rare-earth-oxide (REO) content: | | | | | |
| Compounds: | | | | | |
| Cerium compounds | do. | 608,000 | 9,200 ^r | 440,000 | 10,700 |
| Other | do. | 3,800,000 | 43,700 | 4,500,000 | 43,800 |
| Metals: | | | | | |
| Ferrocerium and other pyrophoric alloys | do. | 1,630,000 | 18,000 | 1,220,000 | 15,800 |
| Other, metals and alloys | do. | 140,000 | 3,490 | 56,800 | 3,750 |
| Selenium and tellurium: | | | | | |
| Selenium, Se content | do. | 521,000 | 9,620 | 468,000 | 8,160 |
| Tellurium, Te content | do. | 27,900 | 1,920 | 40,800 | 2,530 |
| Silicon, gross weight: | | | | | |
| Ferrosilicon | metric tons | 15,900 | 27,900 | 16,700 | 31,300 |
| Metal | do. | 45,400 | 1,670,000 | 36,800 | 1,280,000 |
| Silver: | | | | | |
| Bullion, Ag content | kilograms | 342,000 ^r | 248,000 ^r | 781,000 | 557,000 |
| Dore, Ag content | do. | 31,700 ^r | 19,700 ^r | 34,400 | 18,300 |
| Metal powder, gross weight | do. | 731,000 | 511,000 | 617,000 | 375,000 |
| Nitrate, gross weight | do. | 33,000 | 3,770 | 28,900 | 3,170 |
| Ores and concentrates, Ag content | do. | 5,740 | 17,900 | 2,500 | 8,480 |
| Semimanufactured forms containing 99.5% or more by weight of silver, gross weight | do. | 510,000 ^r | 344,000 ^r | 265,000 | 140,000 |
| Waste and scrap, gross weight | do. | 15,600,000 ^r | 1,570,000 | 14,700,000 | 1,430,000 |
| Unwrought, other, gross weight | do. | 102,000 | 99,900 | 126,000 | 118,000 |
| Thorium and thorium-bearing materials, compounds | do. | 15,300 ^r | 1,970 ^r | 2,160 | 776 |
| Tin: | | | | | |
| Unwrought: | | | | | |
| Refined tin | metric tons | 2,920 | 25,200 | 807 | 14,900 |
| Tin alloys | do. | 2,790 | 20,300 | 2,540 | 19,400 |
| Wrought: | | | | | |
| Tin bars, rods, profiles, wire | do. | 5,140 | 38,800 | 5,180 | 40,700 |
| Tin foil | do. | 23 | 344 | 33 | 563 |
| Tin plates, sheet, strip | do. | 1,180 | 3,110 | 300 | 2,280 |
| Tin tubes, pipes, tube and pipe fittings | do. | 113 | 1,130 | 114 | 1,630 |
| Tin waste and scrap | do. | 7,480 | 19,600 | 2,530 | 7,350 |
| Tin flakes and powders | do. | 174 | 4,260 | 110 | 2,470 |
| Tinplate and terneplate | do. | 104,000 ^r | 105,000 ^r | 105,000 | 76,500 |
| Titanium: | | | | | |
| Metal, scrap, unwrought, wrought products and castings, ferrotitanium and ferrosilicon titanium | do. | 34,600 ^r | 1,500,000 ^r | 35,400 | 1,470,000 |
| Ores and concentrates | do. | 2,240 | 5,400 | 2,040 | 3,500 |
| Pigment, dioxide and oxide | do. | 685,000 | 1,790,000 | 648,000 | 1,460,000 |
| Tungsten, W content: | | | | | |
| Ammonium paratungstate | do. | 653 | 9,140 | 310 | 3,280 |
| Carbide powder | do. | 994 ^r | 58,900 ^r | 901 | 46,600 |
| Metal powders | do. | 448 | 33,300 | 312 | 23,000 |
| Miscellaneous tungsten-bearing materials, ferrotungsten, ferrosilicon tungsten, unwrought, waste and scrap, wrought, compounds | do. | 3,400 ^r | 56,800 ^r | 1,840 | 40,300 |
| Ores and concentrates | do. | 1,230 | 34,700 | 398 | 6,890 |

See footnotes at end of table.

TABLE 7—Continued
U.S. EXPORTS OF PRINCIPAL MINERALS AND PRODUCTS, EXCLUDING MINERAL FUELS^{1,2}

(Thousand metric tons and thousand dollars unless otherwise specified)

| Commodity | | 2014 | | 2015 | |
|---|-----------------|----------------------|-------------------------|----------|------------|
| | | Quantity | Value | Quantity | Value |
| Metals:—Continued | | | | | |
| Vanadium: | | | | | |
| Aluminum-vanadium master alloy, gross weight | kilograms | 443,000 | 12,400 | 229,000 | 6,450 |
| Ferrovandium, V content | do. | 253,000 | 7,510 | 122,000 | 3,190 |
| Metal, including waste and scrap, gross weight | do. | 31,900 | 1,150 | 5,200 | 354 |
| Pentoxide, anhydride, V content | do. | 201,000 | 2,890 ^r | 356,000 | 3,430 |
| Other oxides and hydroxides, V content | do. | 350,000 | 4,800 | 99,800 | 841 |
| Zinc: | | | | | |
| Compounds, chromates of zinc or of lead, lithopone, chloride, oxide, sulfate, sulfide | metric tons | XX | 46,700 | XX | 52,300 |
| Ores and concentrates, Zn content | do. | 644,000 | 1,120,000 | 709,000 | 987,000 |
| Refined | do. | 19,800 | NA | 12,700 | NA |
| Zirconium: | | | | | |
| Ferrozirconium | do. | 1,710 ^r | 4,110 ^r | 1,620 | 3,270 |
| Ores and concentrates | do. | 9,020 ^r | 22,200 ^r | 6,270 | 17,400 |
| Oxide, includes germanium oxide and zirconium dioxide | do. | 7,380 | NA | 5,740 | NA |
| Unwrought, including powders | do. | 325 | 12,300 ^r | 214 | 7,350 |
| Waste and scrap | do. | 1,150 ^r | 101,000 ^r | 1,320 | 116,000 |
| Total | | XX | 65,700,000 ^r | XX | 57,200,000 |
| Industrial minerals: | | | | | |
| Abrasives, manufactured: | | | | | |
| Aluminum oxide, crude | metric tons | 19,500 | 69,000 | 15,000 | 51,900 |
| Metallic abrasives | do. | 41,000 | 61,400 | 35,900 | 45,600 |
| Silicon carbide, crude, ground and refined | do. | 22,300 | 41,800 | 19,700 | 38,300 |
| Asbestos, includes reexports: | | | | | |
| Manufactured | do. | NA | 29,800 ^r | NA | 26,000 |
| Unmanufactured | do. | 279 | 54 | 517 | 116 |
| Barite, natural barium sulfate | do. | 153,000 | 41,800 | 139,000 | 51,300 |
| Boron minerals and compounds: | | | | | |
| Boric acid, includes orthoboric and anhydrous | do. | 225,000 | 178,000 | 198,000 | 323,000 |
| Sodium borates | do. | 584,000 | 304,000 | 495,000 | 264,000 |
| Bromine: | | | | | |
| Compounds, includes methyl bromine and ethylene dibromide, Br content | do. | 17,200 ^r | 58,200 ^r | 21,100 | 71,100 |
| Elemental, gross weight | do. | 3,420 | 8,890 | 3,960 | 8,850 |
| Cement, hydraulic and clinker ⁴ | | 1,440 ^r | 237,000 ^r | 1,330 | 224,000 |
| Clay: | | | | | |
| Ball | | 33 | 7,540 ^r | 48 | 10,200 |
| Bentonite | | 901 | 179,000 ^r | 938 | 199,000 |
| Fire | | 237 | 52,700 | 217 | 40,600 |
| Fuller's earth | | 92 | 34,900 | 77 | 31,700 |
| Kaolin | | 2,640 | 596,000 | 2,420 | 557,000 |
| Other, n.e.c. ⁵ | | 282 | 72,000 | 268 | 73,600 |
| Diamond: | | | | | |
| Exclusive of industrial diamond, including reexports | thousand carats | 14,500 | 21,300,000 | 12,200 | 18,500,000 |
| Industrial including exports and reexports: | | | | | |
| Unworked, reexports | do. | 827 ^r | 23,400 ^r | 569 | 21,500 |
| Powder, dust and grit, natural and synthetic | do. | 175,000 ^r | 86,500 ^r | 157,000 | 74,500 |
| Diatomite | | 82 | 44,300 ^r | 75 | 41,300 |
| Feldspar | metric tons | 16,000 | 5,880 | 15,100 | 4,920 |
| Fluorspar | do. | 13,400 | 2,300 | 13,700 | 2,210 |
| Garnet, industrial | do. | 15,400 | 12,800 | 14,700 | 11,000 |
| Graphite, natural and artificial | do. | 44,600 ^r | 241,000 ^r | 43,700 | 198,000 |
| Gypsum and gypsum products: | | | | | |
| Crude | | 67 | 29,900 | 63 | 28,000 |
| Plasters | | 101 | 46,000 ^r | 95 | 42,100 |

See footnotes at end of table.

TABLE 7—Continued
 U.S. EXPORTS OF PRINCIPAL MINERALS AND PRODUCTS, EXCLUDING MINERAL FUELS^{1,2}

(Thousand metric tons and thousand dollars unless otherwise specified)

| Commodity | 2014 | | 2015 | |
|---|----------------------|---------------------|----------|-----------|
| | Quantity | Value | Quantity | Value |
| Industrial minerals:—Continued | | | | |
| Gypsum and gypsum products:—Continued | | | | |
| Boards | 829 | 150,000 | 767 | 137,000 |
| Other | XX | 73,100 | XX | 79,100 |
| Helium, Grade-A | million cubic meters | 67.5 ^r | 64.8 | NA |
| Iodine: | | | | |
| Crude, resublimed | metric tons | 1,240 | 1,190 | 29,100 |
| Potassium iodide | do. | 256 ^r | 282 | 5,670 |
| Iron oxide pigments and hydroxides: | | | | |
| Pigment grade | do. | 8,790 | 8,930 | 17,200 |
| Other grade | do. | 60,600 | 58,200 | 32,700 |
| Kyanite and related materials | do. | 40,000 | 39,900 | 13,900 |
| Lime | | 320 ^r | 346 | 62,500 |
| Lithium chemicals, Li content: | | | | |
| Carbonate | metric tons | 170 | 255 | 7,880 |
| Hydroxide | do. | 1,240 | 1,520 | 74,900 |
| Magnesium compounds: | | | | |
| Chloride, hydroxide and peroxide, sulfate | | XX | XX | 35,100 |
| Magnesite, crude and processed: | | | | |
| Caustic-calcined magnesia | metric tons | 3,130 | 5,680 | 3,810 |
| Dead-burned and fused magnesia | do. | 20,800 | 24,800 | 16,700 |
| Other magnesia | do. | 14,500 | 13,100 | 13,500 |
| Crude | do. | 770 | 520 | 764 |
| Mica: | | | | |
| Scrap and flake: | | | | |
| Powder | do. | 8,020 | 7,100 | 9,560 |
| Waste | do. | 58 | 279 | 89 |
| Sheet: | | | | |
| Unworked | do. | 168 | 57 | 253 |
| Worked | do. | 865 | 914 | 20,500 |
| Nitrogen, major compounds, N content | | 1,430 ^r | 1,260 | NA |
| Peat | | 29 | 28 | NA |
| Perlite, crude ^e | metric tons | 45,000 | 40,000 | NA |
| Phosphate rock: | | | | |
| Diammonium phosphate | | 2,500 | 2,110 | 942,000 |
| Elemental phosphorus | metric tons | 20,100 ^r | 18,800 | 61,800 |
| Monoammonium phosphate | | 2,160 | 2,250 | 1,070,000 |
| Phosphoric acid | | 623 | 443 | 163,000 |
| Potash, gross weight: | | | | |
| Potassium chloride | metric tons | 73,400 | 27,700 | NA |
| Potassium sulfates, all grades | do. | 210,000 | 350,000 | NA |
| Potassium nitrate | do. | 8,690 | 8,810 | NA |
| Pumice and pumicite | | 14 | 11 | NA |
| Salt | | 935 ^r | 841 | 149,000 |
| Sand and gravel: | | | | |
| Construction: | | | | |
| Sand | | 79 | 60 | 16,900 |
| Gravel | | 8 | 11 | 4,790 |
| Industrial | | 4,450 | 3,890 | 384,000 |
| Soda ash | | 6,670 | 6,390 | 1,320,000 |
| Stone: | | | | |
| Crushed | | 460 | 436 | 48,000 |
| Dimension | | XX | XX | 75,100 |
| Strontium carbonate, precipitated | kilograms | 174,000 | 145,000 | 147 |

See footnotes at end of table.

TABLE 7—Continued
 U.S. EXPORTS OF PRINCIPAL MINERALS AND PRODUCTS, EXCLUDING MINERAL FUELS^{1,2}

(Thousand metric tons and thousand dollars unless otherwise specified)

| Commodity | 2014 | | 2015 | |
|---|--------------------|----------------------|-------------------------|---------|
| | Quantity | Value | Quantity | Value |
| Industrial minerals:—Continued | | | | |
| Sulfur: | | | | |
| Elemental | 2,010 ^r | 315,000 ^r | 1,850 | 281,000 |
| Sulfuric acid, 100% H ₂ SO ₄ | metric tons | 160,000 ^r | 21,800 | 172,000 |
| Talc, excludes powders-talcum (in package), face, compact | do. | 190,000 ^r | 55,500 ^r | 206,000 |
| Vermiculite | | 3 | NA | 2 |
| Wollastonite ^e | metric tons | <10,000 | NA | <10,000 |
| Zeolites ^c | do. | 100–300 ^r | NA | 100–300 |
| Total | | XX | 29,100,000 ^r | XX |
| Grand total | | XX | 94,900,000 ^r | XX |

^eEstimated. ^rRevised. do. Ditto. NA Not available. XX Not applicable. -- Zero.

¹Includes data available through June 2018.

²Data are rounded to no more than three significant digits; may not add to totals shown.

³Less than ½ unit.

⁴Excludes Puerto Rico.

⁵Not elsewhere classified.

TABLE 8
U.S. IMPORTS FOR CONSUMPTION OF PRINCIPAL MINERALS AND PRODUCTS, EXCLUDING MINERAL FUELS^{1,2}

(Thousand metric tons and thousand dollars unless otherwise specified)

| Commodity | 2014 | | 2015 | | |
|---|-------------|----------------------|----------------------|--------------------|----------------------|
| | Quantity | Value ³ | Quantity | Value ³ | |
| Metals: | | | | | |
| Aluminum: | | | | | |
| Crude and semicrude | metric tons | 4,850,000 | 12,100,000 | 5,080,000 | 12,200,000 |
| Manufactures | do. | 409,000 | 1,340,000 | 400,000 | 1,200,000 |
| Antimony: | | | | | |
| Metal | do. | 6,210 | 49,300 | 5,790 | 44,400 |
| Ore and concentrate, Sb content | do. | 378 ^r | 4,240 ^r | 308 | 3,330 |
| Oxide, Sb content | do. | 17,600 | 138,000 | 16,700 | 111,000 |
| Arsenic: | | | | | |
| Metal | do. | 688 | 2,210 | 514 | 1,400 |
| Trioxide | do. | 6,940 | 4,000 | 7,810 | 4,470 |
| Bauxite and alumina: | | | | | |
| Alumina, calcined equivalent | | 1,630 | 727,000 | 1,570 | 705,000 |
| Bauxite: | | | | | |
| Calcined, refractory and other grade | | 601 | 71,600 | 526 | 57,800 |
| Crude and dried | | 10,800 | 406,000 ⁴ | 10,700 | 387,000 ⁴ |
| Beryllium, ore, concentrates, oxide, hydroxide, unwrought including powders, waste and scrap, other, beryllium-copper master alloys, beryllium-copper plates, sheets, strip, Be content | kilograms | 68,500 | 18,800 | 66,200 | 19,300 |
| Bismuth, metallic | do. | 2,270,000 | 52,700 | 1,950,000 | 35,500 |
| Cadmium: | | | | | |
| Oxide | do. | 53,600 | 610 | 50,000 | 624 |
| Pigments | do. | 351,000 | 7,770 | 281,000 | 9,260 |
| Sulfide, gross weight | do. | 9,000 | 1,680 | 1,870 | 343 |
| Unwrought metal and powders | do. | 133,000 | 399 | 237,000 | 769 |
| Waste and scrap | do. | -- | -- | 70,500 | 551 |
| Chromium: | | | | | |
| Chromite ore, Cr content | metric tons | 84,900 | 41,000 ^r | 81,800 | 28,300 |
| Metals and alloys, Cr content: | | | | | |
| Ferroalloys, high-carbon, low-carbon, ferrochromium-silicon | do. | 359,000 | 803,000 ^r | 228,000 | 517,000 |
| Metal, unwrought powders, waste and scrap, other | do. | 17,500 ^r | 192,000 | 12,800 | 144,000 |
| Chemicals, gross weight: | | | | | |
| Oxides, hydroxides, trioxide and other | do. | 10,100 ^r | 35,800 | 10,800 | 35,100 |
| Sulfates | do. | 303 | 321 | 500 | 452 |
| Salts of oxometallic or peroxometallic acids, zinc and lead chromate, sodium dichromate, potassium dichromate, other | do. | 1,040 | 3,990 | 1,010 | 5,130 |
| Carbide | do. | 238 | 5,040 | 109 | 2,550 |
| Pigments and preparations based on chromium, gross weight | do. | 1,250 | 8,560 | 1,560 | 7,640 |
| Cobalt, Co content: | | | | | |
| Metal, unwrought, excluding alloys and waste and scrap, includes cathode and metal powder, may include intermediate products of cobalt metallurgy | do. | 9,000 ^r | 269,000 ^r | 9,290 | 267,000 |
| Oxides and hydroxides | do. | 1,730 ^r | 57,200 ^r | 1,260 | 40,200 |
| Other forms, includes acetates, carbonates, chlorides, sulfates | do. | 593 | 19,500 | 855 | 26,300 |
| Copper: | | | | | |
| Unmanufactured, does not include unalloyed scrap, Cu content | do. | 622,000 | 4,360,000 | 690,000 | 4,050,000 |
| Semimanufactures | do. | XX | 1,830,000 | XX | 1,350,000 |
| Scrap, unalloyed, Cu content | do. | 31,000 | 166,000 | 28,600 | 130,000 |
| Ferroalloys not listed elsewhere: | | | | | |
| Ferrophosphorus | do. | 8,060 | 4,740 | 6,160 | 3,450 |
| Other | do. | 9,720 ^r | 32,400 ^r | 10,100 | 20,900 |
| Gallium: | | | | | |
| Unwrought and powders | kilograms | 53,900 | 13,600 | 28,600 | 7,120 |
| Gallium arsenide wafers, doped and undoped | do. | 391,000 ^r | 187,000 | 2,690,000 | 245,000 |
| Germanium, metal | do. | 23,700 | 40,300 | 20,100 | 31,400 |

See footnotes at end of table.

TABLE 8—Continued
 U.S. IMPORTS FOR CONSUMPTION OF PRINCIPAL MINERALS AND PRODUCTS, EXCLUDING MINERAL FUELS^{1,2}

(Thousand metric tons and thousand dollars unless otherwise specified)

| Commodity | 2014 | | 2015 | | |
|---|-------------|----------------------|------------------------|--------------------|-----------|
| | Quantity | Value ³ | Quantity | Value ³ | |
| Metals:—Continued | | | | | |
| Gold: | | | | | |
| Ores and concentrates | kilograms | 410 ^r | 16,200 ^r | 447 | 18,400 |
| Dore and precipitates | do. | 186,000 | 7,740,000 | 174,000 | 6,710,000 |
| Bullion, refined | do. | 121,000 | 5,000,000 ^r | 89,800 | 3,380,000 |
| Waste and scrap | do. | 58,100 ^r | 973,000 ^r | 60,900 | 618,000 |
| Metal powder | do. | 588 ^r | 7,140 ^r | 373 | 10,100 |
| Compounds | do. | 1,810 | 4,230 ^r | 54,000 | 6,040 |
| Indium, unwrought metal and powders | do. | 123,000 | 80,800 | 140,000 | 55,500 |
| Iron and steel: | | | | | |
| Steel mill products | | 40,200 | NA | 35,200 | NA |
| Fabricated steel products | | 5,160 | NA | 5,740 | NA |
| Cast iron and steel products | | 523 | NA | 540 | NA |
| Stainless steel | metric tons | 1,050,000 | NA | 1,290,000 | NA |
| Iron and steel scrap: | | | | | |
| Ferrous, includes tinplate and terneplate, excludes used rails for rerolling and other uses and ships, boats, and other vessels for scrapping | | 4,220 ^r | 1,740,000 ^r | 3,510 | 955,000 |
| Pig iron, all grades | metric tons | 4,600,000 | 1,850,000 | 4,530,000 | 1,290,000 |
| Direct-reduced iron, steelmaking grade | do. | 2,390,000 | 854,000 | 1,860,000 | 483,000 |
| Ships, boats, and other vessels for scrapping | | (⁵) | 451 | (⁵) | 256 |
| Used rails for rerolling and other uses, includes mixed (used plus new) rails | metric tons | 72,900 ^r | 33,300 | 103,000 | 29,900 |
| Iron ore | | 5,140 | 676,000 | 4,550 | 455,000 |
| Lead: | | | | | |
| Base bullion | metric tons | 1,080 | 1,900 | 321 | 493 |
| Pigs and bars, Pb content | do. | 593,000 | 1,220,000 | 521,000 | 979,000 |
| Pigments and compounds, Pb content | do. | 34,600 | 66,900 | 40,400 | 71,800 |
| Scrap, reclaimed, includes ash and residues, Pb content | do. | 11,400 | 15,200 | 7,450 | 6,320 |
| Wrought, all forms, including wire and powders, gross weight | do. | 1,600 | 6,680 | 1,660 | 6,420 |
| Magnesium: | | | | | |
| Waste and scrap, gross weight | do. | 19,000 | 43,800 | 21,300 | 44,400 |
| Metal, gross weight | do. | 16,400 ^r | 65,200 ^r | 14,200 | 55,700 |
| Alloys, Mg content | do. | 10,900 ^r | 53,000 ^r | 11,300 | 52,600 |
| Powder, sheets, tubing, ribbons, wire, other forms, Mg content | do. | 8,330 ^r | 30,700 ^r | 6,740 | 28,200 |
| Manganese: | | | | | |
| Ores and concentrates with 20% or more manganese, Mn content | do. | 186,000 ^r | 84,900 ^r | 216,000 | 92,500 |
| Ferromanganese, all grades, Mn content | do. | 283,000 ^r | 398,000 ^r | 228,000 | 343,000 |
| Silicomanganese, Mn content | do. | 309,000 ^r | 523,000 ^r | 216,000 | 328,000 |
| Metal, unwrought, other wrought, waste and scrap, gross weight | do. | 39,100 ^r | 92,800 ^r | 30,600 | 71,600 |
| Chemicals, gross weight: | | | | | |
| Manganese dioxide | do. | 14,000 ^r | 28,700 ^r | 6,820 | 15,100 |
| Potassium permanganate | do. | 1,610 | 4,530 | 908 | 2,370 |
| Mercury: | | | | | |
| Metal | kilograms | 49,500 ^r | 1,280 | 25,800 | 602 |
| Amalgams of precious metals whether or not chemically defined | do. | 21,500 ^r | 56,100 ^r | 21,500 | 45,600 |
| Molybdenum: | | | | | |
| Ores and concentrates, including roasted and other, Mo content | metric tons | 15,800 | 400,000 ^r | 12,900 | 206,000 |
| Chemicals: | | | | | |
| Oxides and hydroxides, gross weight | do. | 448 | 8,410 | 756 | 10,100 |
| Molybdates, all, Mo content | do. | 669 ^r | 20,700 | 578 | 12,000 |
| Orange, gross weight | do. | 431 | 3,010 | 609 | 2,580 |
| Ferromolybdenum, Mo content | do. | 5,110 | 147,000 | 1,610 | 36,300 |
| Other, includes powders, unwrought, bars and rods, waste and scrap, wire, other, gross weight | do. | 3,330 | 119,000 | 1,400 | 55,800 |

See footnotes at end of table.

TABLE 8—Continued
 U.S. IMPORTS FOR CONSUMPTION OF PRINCIPAL MINERALS AND PRODUCTS, EXCLUDING MINERAL FUELS^{1,2}

(Thousand metric tons and thousand dollars unless otherwise specified)

| Commodity | 2014 | | 2015 | | |
|---|-------------|------------------------|------------------------|--------------------|-----------|
| | Quantity | Value ³ | Quantity | Value ³ | |
| Metals:—Continued | | | | | |
| Nickel, Ni content: | | | | | |
| Primary, unwrought and chemicals | metric tons | 156,000 | 2,680,000 ^r | 130,000 | 1,770,000 |
| Secondary, stainless steel scrap and waste and scrap | do. | 39,000 ^r | 642,000 | 27,100 | 337,000 |
| Wrought, not alloyed, bars, rods, profiles, wire, sheets, strip, foil, tubes, pipes | do. | 727 ^r | 20,900 | 790 | 19,800 |
| Alloyed, unwrought ingot, bars, rods, profiles, wire, sheets, strip, foil, tubes, pipes, other alloyed articles | do. | 33,500 ^r | 924,000 ^r | 32,200 | 557,000 |
| Niobium (columbium) and tantalum, gross quantity: | | | | | |
| Niobium: | | | | | |
| Ores and concentrates | kilograms | 2,000 | 148 | -- | -- |
| Oxide | do. | 1,460,000 | 54,100 ^r | 1,410,000 | 50,900 |
| Ferroniobium | do. | 12,500,000 | 341,000 | 10,100,000 | 271,000 |
| Unwrought powders | do. | 1,870,000 | 95,800 | 886,000 | 45,400 |
| Tantalum: | | | | | |
| Ores and concentrates | do. | 897,000 ^r | 71,300 ^r | 730,000 | 49,300 |
| Unwrought powders | do. | 114,000 | 50,600 | 150,000 | 58,400 |
| Unwrought, alloys and metal | do. | 178,000 | 68,900 | 237,000 | 81,000 |
| Waste and scrap | do. | 625,000 ^r | 73,000 ^r | 568,000 | 56,400 |
| Wrought | do. | 43,900 ^r | 25,900 | 41,300 | 21,500 |
| Platinum-group metals: | | | | | |
| Platinum, grains and nuggets, sponge, other unwrought, other, waste and scrap, coins, Pt content | do. | XX | 3,080,000 | XX | 2,370,000 |
| Palladium, unwrought and other, Pd content | do. | 92,400 | 2,370,000 | 82,500 | 1,880,000 |
| Iridium, unwrought and other forms, Ir content | do. | 1,990 | 33,900 | 1,010 | 17,400 |
| Osmium, unwrought, Os content | do. | 322 | 1,670 | 8 | 59 |
| Ruthenium, unwrought, Ru content | do. | 11,100 | 24,600 | 8,230 | 14,600 |
| Rhodium, unwrought and other forms, Rh content | do. | 11,100 | 408,000 | 10,600 | 336,000 |
| Rare earths, estimated equivalent rare-earth-oxide (REO) content: | | | | | |
| Cerium compounds, including oxides | do. | 1,440,000 | 24,500 | 1,440,000 | 24,400 |
| Other rare-earth compounds: | | | | | |
| Carbonates, lanthanum and other | do. | 597,000 | 5,450 | 540,000 | 2,540 |
| Chlorides | do. | 118,000 ^r | 6,020 ^r | 176,000 | 3,550 |
| Oxides, except cerium oxide | do. | 5,160,000 ^r | 44,800 ^r | 3,120,000 | 19,000 |
| Unspecified | do. | 3,280,000 | 69,900 | 3,830,000 | 92,200 |
| Yttrium materials and compounds content by weight greater than 19% but less than 85% oxide equivalent | | 108,000 | 25,100 | 50,400 | 11,400 |
| Metals and alloys: | | | | | |
| Ferrocerium and other pyrophoric alloys | do. | 371,000 | 8,350 | 356,000 | 6,310 |
| Cesium, unalloyed | do. | 134,000 | 947 | 140,000 | 1,040 |
| Lanthanum, unalloyed | do. | 60,800 | 668 ^r | 74,200 | 464 |
| Neodymium, unalloyed | do. | 2,760 | 869 | 5,680 | 417 |
| Other, unalloyed | do. | 30,100 | 772 | 73,700 | 1,050 |
| Other, alloys | do. | 120,000 | 2,350 | 89,100 | 1,380 |
| Rhenium: | | | | | |
| Metal | do. | 17,600 ^r | 45,100 | 25,400 | 63,600 |
| Ammonium perrhenate | do. | 10,700 ^r | 18,000 ^r | 9,130 | 13,900 |
| Selenium and tellurium: | | | | | |
| Selenium, Se content: | | | | | |
| Selenium | do. | 467,000 | 26,200 | 444,000 | 19,300 |
| Dioxide | do. | 7,770 ^r | 528 | 19,200 | 629 |
| Tellurium, Te content | do. | 109,000 ^r | 6,230 ^r | 76,000 | 5,990 |
| Silicon, Si content | | | | | |
| Ferrosilicon | metric tons | 186,000 | 398,000 | 162,000 | 322,000 |
| Metal | do. | 139,000 | 453,000 | 139,000 | 464,000 |

See footnotes at end of table.

TABLE 8—Continued
 U.S. IMPORTS FOR CONSUMPTION OF PRINCIPAL MINERALS AND PRODUCTS, EXCLUDING MINERAL FUELS^{1,2}

(Thousand metric tons and thousand dollars unless otherwise specified)

| Commodity | 2014 | | 2015 | | |
|--|-----------|------------------------|------------------------|--------------------|-----------|
| | Quantity | Value ³ | Quantity | Value ³ | |
| Metals:—Continued | | | | | |
| Silver: | | | | | |
| Ash and residues, ores and concentrates, Ag content | kilograms | 59 | 12 | 253 | 61 |
| Bullion, Ag content | do. | 3,920,000 ^r | 2,440,000 ^r | 4,660,000 | 2,410,000 |
| Dore, Ag content | do. | 1,070,000 | 960,000 ^r | 1,270,000 | 993,000 |
| Metal powder, gross weight | do. | 818,000 ^r | 334,000 ^r | 514,000 | 113,000 |
| Nitrate, gross weight | do. | 2,350 ^r | 546 ^r | 2,550 | 351 |
| Semimanufactured forms containing 99.5% or more by weight of silver, gross weight | do. | 895,000 | 509,000 | 441,000 | 199,000 |
| Waste and scrap, gross weight | do. | 6,280,000 ^r | 278,000 ^r | 5,400,000 | 293,000 |
| Unwrought, other, gross weight | do. | 211,000 ^r | 104,000 ^r | 237,000 | 98,200 |
| Thorium and thorium-bearing materials, compounds | do. | 11,000 | 761 | 2,700 | 214 |
| Tin, gross weight: | | | | | |
| Unwrought: | | | | | |
| Refined | do. | 35,600 | 787,000 | 33,600 | 546,000 |
| Alloys | do. | 1,570 | 30,200 | 2,720 | 43,400 |
| Wrought: | | | | | |
| Bars, rods, profiles, wire | do. | 1,890 | 38,200 | 1,220 | 21,300 |
| Foil | do. | 73 | 2,940 | 96 | 3,400 |
| Plates, sheet, strip | do. | 116 | 647 | 90 | 502 |
| Tubes, pipes, tube and pipe fittings | do. | 17 | 100 | 12 | 149 |
| Waste and scrap | do. | 49,700 | 19,400 | 32,700 | 12,300 |
| Flakes and powders | do. | 170 | 4,760 | 238 | 5,400 |
| Oxides | do. | 412 | 8,290 | 417 | 7,340 |
| Tinplate and terneplate | do. | 633,000 ^r | 695,000 ^r | 700,000 | 729,000 |
| Titanium: | | | | | |
| Concentrate: | | | | | |
| Ilmenite | do. | 355,000 | 61,100 | 649,000 | 107,000 |
| Rutile, natural and synthetic | do. | 343,000 ^r | 267,000 | 393,000 | 282,000 |
| Metal: | | | | | |
| Waste and scrap | do. | 19,300 | 100,000 ^r | 22,000 | 123,000 |
| Unwrought: | | | | | |
| Sponge | do. | 17,700 | 193,000 | 20,700 | 203,000 |
| Ingots | do. | 700 | 15,600 | 517 | 13,500 |
| Powder | do. | 120 | 6,670 | 130 | 8,280 |
| Other | do. | 1,510 | 44,000 | 1,560 | 40,100 |
| Wrought products and castings, includes bar, castings, foil, pipe, plate, profile, rod, sheet, strip, tube, wire, other | do. | 6,260 ^r | 326,000 ^r | 6,530 | 321,000 |
| Ferrotitanium and ferrosilicon titanium | do. | 2,210 | 9,290 | 1,730 | 6,260 |
| Pigment, dioxide and oxide | do. | 224,000 | 627,000 | 222,000 | 548,000 |
| Titaniferous iron ore | do. | 138 | 62 | 64,700 | 32,400 |
| Titaniferous slag | do. | 678,000 | 455,000 | 399,000 | 248,000 |
| Tungsten, W content: | | | | | |
| Ammonium paratungstate | do. | 1,780 | 66,800 | 1,270 | 35,500 |
| Ferrotungsten and ferrosilicon tungsten | do. | 454 | 18,800 | 269 | 9,060 |
| Miscellaneous tungsten-bearing materials, metal powders, carbide powder, unwrought, waste and scrap, wrought, oxides, calcium tungstate, other tungstates, other compounds | do. | 6,580 ^r | 327,000 ^r | 4,730 | 189,000 |
| Ores and concentrates | do. | 4,080 | 139,000 ^r | 3,970 | 98,700 |
| Vanadium: | | | | | |
| Aluminum-vanadium master alloy, gross weight | kilograms | 431,000 | 9,820 | 204,000 | 4,520 |
| Ferrovandium, V content | do. | 3,230,000 | 94,700 ^r | 2,010,000 | 64,700 |
| Metal, including waste and scrap, gross weight | do. | 161,000 | 3,860 | 182,000 | 3,460 |
| Miscellaneous chemicals, sulfates and vanadates, V content | do. | 215,000 | 4,320 | 186,000 | 2,470 |
| Pentoxide, anhydride, V content | do. | 3,410,000 | 46,300 | 2,970,000 | 32,800 |

See footnotes at end of table.

TABLE 8—Continued
 U.S. IMPORTS FOR CONSUMPTION OF PRINCIPAL MINERALS AND PRODUCTS, EXCLUDING MINERAL FUELS^{1,2}

(Thousand metric tons and thousand dollars unless otherwise specified)

| Commodity | 2014 | | 2015 | |
|--|---------------------|-------------------------|-----------|--------------------|
| | Quantity | Value ³ | Quantity | Value ³ |
| Metals:—Continued | | | | |
| Vanadium:—Continued | | | | |
| Vanadium-bearing ash and residues from the manufacture of iron and steel, V ₂ O ₅ content kilograms | 6,160,000 | 37,900 | 9,440,000 | 36,700 |
| Other oxides and hydroxides, V content do. | 104,000 | 1,950 | 93,700 | 1,840 |
| Zinc: | | | | |
| Compounds, chloride, chromates of zinc or of lead, compounds n.s.p.f., ⁶ lithopone, oxide, sulfate, sulfide, gross weight metric tons | XX | 346,000 | XX | 331,000 |
| Ores and concentrates, Zn content do. | 2 | 4 | 22 | NA |
| Refined do. | 805,000 | NA | 771,000 | NA |
| Zirconium and hafnium: | | | | |
| Hafnium, unwrought, including powders do. | 21 | 10,800 | 72 | 19,400 |
| Zirconium: | | | | |
| Ferrozirconium do. | 131 | 774 | 158 | 668 |
| Ores and concentrates do. | 50,400 | 60,800 | 31,900 | 37,200 |
| Oxide do. | 4,240 | NA | 4,200 | NA |
| Unwrought, including powder do. | 572 ^r | 26,500 | 954 | 17,400 |
| Waste and scrap do. | 528 | 52,100 | 361 | 27,800 |
| Total | XX | 67,100,000 ^r | XX | 55,500,000 |
| Industrial minerals: | | | | |
| Abrasives, manufactured: | | | | |
| Aluminum oxide, crude, ground and refined metric tons | 198,000 | 172,000 | 164,000 | 136,000 |
| Metallic abrasives do. | 23,500 | 24,000 | 52,800 | 30,900 |
| Silicon carbide, crude, ground and refined do. | 130,000 | 118,000 | 139,000 | 114,000 |
| Asbestos: | | | | |
| Chrysotile and other unspecified type do. | 406 | 741 | 343 | 612 |
| Products with basis of asbestos, cellulose, or other minerals | NA | 6,370 | NA | 5,240 |
| Barite: | | | | |
| Chloride, oxide, hydroxide, peroxide, precipitated carbonate | XX | 11,300 | XX | 8,550 |
| Crude metric tons | 971,000 | 135,000 | 521,000 | 76,100 |
| Ground do. | 1,720,000 | 228,000 | 1,120,000 | 146,000 |
| Other sulfates do. | 16,400 | 24,100 | 25,500 | 24,500 |
| Boron minerals and compounds: | | | | |
| Borax | 152 | 52,400 | 136 | 49,200 |
| Boric acid metric tons | 56,600 | 37,600 | 39,800 | 25,800 |
| Colemanite | 45 | 14,500 | 35 | 11,900 |
| Ulexite | 34 | 2,840 | 70 | 4,620 |
| Bromine: | | | | |
| Compounds, Br content metric tons | 55,600 ^r | 112,000 ^r | 55,500 | 117,000 |
| Elemental do. | 2,050 | 6,160 | 2,530 | 7,270 |
| Cement, hydraulic and clinker ⁷ | 8,390 ^r | 619,000 ^r | 11,400 | 814,000 |
| Clay: | | | | |
| China clay or kaolin | 518 | 54,400 | 426 | 43,700 |
| Fire clay | 6 | 2,510 | 40 | 6,900 |
| Ball clay | 1 | 173 | 2 | 457 |
| Bentonite | 22 | 25,600 | 16 | 9,350 |
| Fuller's earth | 4 | 183 | 2 | 101 |
| Chamotte or dina's earth | (5) | 124 | (5) | 163 |
| Artificially activated clay and earth | 26 | 14,000 | 24 | 13,600 |
| Diamond, industrial: | | | | |
| Diamond stones, natural industrial and miners', natural and synthetic thousand carats | 2,160 | 31,200 | 1,310 | 22,900 |
| Powder, dust and grit, natural and synthetic do. | 682,000 | 76,700 | 275,000 | 54,600 |

See footnotes at end of table.

TABLE 8—Continued
U.S. IMPORTS FOR CONSUMPTION OF PRINCIPAL MINERALS AND PRODUCTS, EXCLUDING MINERAL FUELS^{1,2}

(Thousand metric tons and thousand dollars unless otherwise specified)

| Commodity | 2014 | | 2015 | | |
|---|----------------------|------------------------|------------------------|--------------------|----------------------|
| | Quantity | Value ³ | Quantity | Value ³ | |
| Industrial minerals—Continued | | | | | |
| Feldspar and nepheline syenite: | | | | | |
| Feldspar | metric tons | 7,910 | 3,120 | 120,000 | 7,090 |
| Nepheline syenite | do. | 503,000 | 64,000 ^r | 449,000 | 67,600 |
| Fluorspar: | | | | | |
| Aluminum fluoride | do. | 38,400 | 50,700 | 32,400 | 41,600 |
| Cryolite | do. | 16,200 | 13,800 | 18,900 | 14,700 |
| Fluorspar | do. | 414,000 | 105,000 | 376,000 | 107,000 |
| Hydrofluoric acid | do. | 125,000 | 213,000 | 120,000 | 196,000 |
| Garnet, industrial | do. | 213,000 | 44,600 | 238,000 | 53,800 |
| Gemstones | thousand carats | 3,230,000 ^r | 26,400,000 | 2,600,000 | 25,100,000 |
| Graphite: | | | | | |
| Natural | metric tons | 69,600 ^r | 72,300 | 46,700 | 58,900 |
| Synthetic | do. | 60,700 | 135,000 ^r | 80,600 | 128,000 |
| Electric furnace electrodes | do. | 84,000 ^r | 285,000 ^r | 71,200 | 231,000 |
| Gypsum: | | | | | |
| Crude | | 3,720 | 56,800 | 4,030 | 54,100 |
| Plasters | | 20 | 7,620 | 21 | 7,210 |
| Boards | | 362 | 84,000 | 348 | 86,100 |
| Other | | XX | 37,300 | XX | 37,000 |
| Helium, Grade-A | million cubic meters | 7.4 | NA | 15.7 | NA |
| Iodine: | | | | | |
| Crude | metric tons | 5,360 | 198,000 | 5,630 | 156,000 |
| Potassium iodide | do. | 283 | 5,200 | 262 | 4,720 |
| Iron oxide pigments: | | | | | |
| Natural | do. | 3,510 | 2,780 | 3,600 | 2,660 |
| Synthetic | do. | 171,000 | 205,000 | 172,000 | 206,000 |
| Kyanite and related materials | do. | 4,020 | 1,550 | 11,500 | 3,680 |
| Lime | | 414 | 65,200 ^{r,4} | 391 | 64,600 ⁴ |
| Lithium chemicals, Li content: | | | | | |
| Carbonate | metric tons | 1,800 | 42,300 ^r | 2,420 | 57,900 |
| Hydroxide | do. | 316 | 12,200 | 324 | 13,600 |
| Magnesium compounds: | | | | | |
| Compounds, chlorides, hydroxide, peroxide, sulfates | do. | XX | 65,600 | XX | 60,100 |
| Magnesite, crude and processed: | | | | | |
| Caustic-calcined magnesia | do. | 151,000 | 48,100 | 183,000 | 54,100 |
| Dead-burned and fused magnesia | do. | 241,000 | 148,000 | 259,000 | 139,000 |
| Other magnesia | do. | 35,600 | 23,200 | 51,000 | 29,800 |
| Crude | do. | 18,400 | 3,790 | 77,900 | 10,400 |
| Mica: | | | | | |
| Scrap and flake: | | | | | |
| Powder | do. | 27,900 | 19,400 | 28,100 | 17,600 |
| Waste | do. | 4,850 | 2,700 | 5,170 | 2,860 |
| Sheet: | | | | | |
| Unworked | do. | 109 | 175 | 112 | 437 |
| Worked | do. | 2,360 | 19,900 | 2,030 | 16,500 |
| Nitrogen, major compounds, N content | | 7,260 ^r | 6,100,000 ^r | 9,060 | 6,750,000 |
| Peat | metric tons | 994,000 ^r | 270,000 ^r | 1,150,000 | 312,000 |
| Perlite, processed crude | do. | 141,000 | NA | 155,000 | NA |
| Phosphate rock and phosphatic materials: | | | | | |
| Phosphate rock: | | | | | |
| Unground | | 2,120 | 193,000 ⁴ | 1,520 | 150,000 ⁴ |
| Ground | | 268 | 45,400 ⁴ | 443 | 75,700 ⁴ |
| Dicalcium phosphate | | 11 | 13,800 ⁴ | 11 | 11,900 ⁴ |

See footnotes at end of table.

TABLE 8—Continued
U.S. IMPORTS FOR CONSUMPTION OF PRINCIPAL MINERALS AND PRODUCTS, EXCLUDING MINERAL FUELS^{1,2}

(Thousand metric tons and thousand dollars unless otherwise specified)

| Commodity | 2014 | | 2015 | | |
|---|-------------|------------------------|--------------------------|----------------------|----------------------|
| | Quantity | Value ³ | Quantity | Value ³ | |
| Industrial minerals:—Continued | | | | | |
| Phosphate rock and phosphatic materials:—Continued | | | | | |
| Elemental phosphorus | 16 | 59,400 ⁴ | 14 | 51,000 ⁴ | |
| Normal superphosphate | 3 | 1,070 ⁴ | -- | -- ⁴ | |
| Triple superphosphate | 432 | 180,000 ⁴ | 235 | 92,800 ⁴ | |
| Diammonium phosphate | 404 | 198,000 ⁴ | 621 | 295,000 ⁴ | |
| Monoammonium phosphate | 959 | 467,000 ⁴ | 582 | 291,000 ⁴ | |
| Fertilizer containing nitrates and phosphates | 21 | 11,900 ⁴ | 87 | 43,100 ⁴ | |
| Phosphoric acid | 1 | 263 ⁴ | 1 | 159 ⁴ | |
| Potash, chloride, sulfate, nitrate, sodium nitrate mixtures, gross weight | 8,200 | 2,390,000 ^r | 8,250 | 2,720,000 | |
| Pumice: | | | | | |
| Crude or unmanufactured | metric tons | 60,000 | 1,380 | 64,000 | 1,860 |
| Wholly or partially manufactured | do. | 161 ^r | 432 ^r | 216 | 600 |
| Salt | | 20,200 ^r | 589,000 ^r | 21,600 | 578,000 |
| Sand and gravel: | | | | | |
| Construction | | 3,930 ^r | 46,100 ^{r,4} | 3,890 | 61,400 ⁴ |
| Industrial | | 244 | 20,400 ⁴ | 290 | 20,200 ⁴ |
| Soda ash | | 39 | 6,900 ^r | 40 | 6,760 |
| Stone: | | | | | |
| Crushed, chips, calcium carbonate fines, excludes precipitated carbonates | | 19,900 | 251,000 ⁴ | 21,900 | 266,000 ⁴ |
| Dimension | | XX | 2,240,000 | XX | 2,350,000 |
| Strontium: | | | | | |
| Carbonate | kilograms | 10,800,000 | 9,020 | 9,710,000 | 8,030 |
| Celestite | do. | 55,100,000 | 2,760 | 55,800,000 | 2,850 |
| Metal | do. | 88,500 | 661 | 141,000 | 1,080 |
| Nitrate | do. | 2,720,000 | 3,570 | 2,720,000 | 3,540 |
| Oxide, hydroxide, peroxide | do. | 225 | 13 | 103,000 | 172 |
| Sulfur: | | | | | |
| Elemental ⁸ | | 2,370 ^e | 134,000 | 2,240 ^e | 136,000 |
| Sulfuric acid, 100% H ₂ SO ₄ | metric tons | 3,070,000 ^r | 190,000 ^r | 3,540,000 | 208,000 |
| Talc, unmanufactured | do. | 308,000 ^r | 102,000 | 322,000 | 109,000 |
| Vermiculite | | 43 ^r | NA | 21 | NA |
| Wollastonite ^e | metric tons | ≤4,000 | NA | ≤4,000 | NA |
| Zeolites ^e | do. | <25 | NA | <50 | NA |
| Total | | XX | 43,700,000 ^r | XX | 43,300,000 |
| Grand total | | XX | 111,000,000 ^r | XX | 98,800,000 |

^eEstimated. ^rRevised. do. Ditto. NA Not available. XX Not applicable. -- Zero.

¹Includes data available through June 2018.

²Data are rounded to no more than three significant digits; may not add to totals shown.

³Customs value unless otherwise specified.

⁴Cost, insurance, and freight value.

⁵Less than ½ unit.

⁶Not specifically provided for.

⁷Excludes Puerto Rico. Data for 2015 adjusted by the U.S. Geological Survey.

⁸General imports.

TABLE 9
WORLD AND U.S. PRODUCTION OF SELECTED NONFUEL MINERAL COMMODITIES¹

(Thousand metric tons unless otherwise specified)

| Commodity | | World total | | | | | United States | |
|---|-------------|------------------------|------------------------|------------------------|------------------------|------------------------|----------------------|------------------------|
| | | 2011 | 2012 | 2013 | 2014 | 2015 | 2015 | Percent of world total |
| Metals: | | | | | | | | |
| Alumina, calcined equivalent ² | | 93,100 ^r | 98,100 ^r | 104,000 ^r | 107,000 ^r | 120,000 | 4,550 | 3.80 |
| Aluminum, primary ³ | | 46,800 ^r | 49,200 ^r | 51,900 ^r | 54,000 ^r | 57,500 ^e | 1,590 | 2.76 |
| Antimony, Sb content | metric tons | 187,000 ^r | 179,000 ^r | 159,000 ^r | 155,000 ^r | 141,000 ^e | -- | -- |
| Arsenic trioxide ^{e,4} | do. | 37,600 ^r | 39,100 ^r | 38,200 ^r | 36,400 ^r | 36,500 | -- | -- |
| Bauxite ⁵ | | 254,000 ^r | 257,000 ^r | 296,000 ^r | 259,000 ^r | 299,000 ^e | W | NA |
| Beryl, gross weight ⁶ | metric tons | 6,540 | 6,610 ^r | 6,600 ^r | 7,530 ^r | 5,740 ^e | 5,100 | 88.9 |
| Bismuth, refinery ^e | do. | 16,700 ^r | 15,600 ^r | 17,100 ^r | 17,100 ^r | 16,400 | -- | -- |
| Cadmium, refinery ^{e,5,7} | do. | 21,100 ^r | 22,300 ^r | 22,700 ^r | 22,700 ^r | 23,200 | W | NA |
| Chromite, marketable output, gross weight | | 26,900 ^r | 26,700 ^r | 30,100 ^r | 30,600 ^r | 28,000 ^e | -- | -- |
| Cobalt, Co content: | | | | | | | | |
| Mine ^{e,8} | metric tons | 111,000 | 105,000 ^r | 114,000 ^r | 122,000 ^r | 126,000 | 760 | 0.60 |
| Refinery ⁹ | do. | 82,400 ^r | 78,100 ^r | 86,700 ^r | 92,700 ^r | 97,400 | -- | -- |
| Copper: | | | | | | | | |
| Mine, recoverable, Cu content ¹⁰ | | 16,100 ^r | 16,900 ^r | 18,300 ^r | 18,400 ^r | 19,100 | 1,380 | 7.23 |
| Smelter, gross weight ¹¹ | | 15,900 | 16,100 ^r | 17,100 | 17,900 ^r | 18,500 | 527 | 2.84 |
| Refinery ¹² | | 19,600 ^r | 20,200 ^r | 21,100 ^r | 22,600 ^r | 23,000 | 1,140 | 4.97 |
| Gold, mine | metric tons | 2,680 ^r | 2,750 ^r | 2,920 ^r | 3,020 ^r | 3,100 ^e | 214 | 6.91 |
| Indium, refinery ^e | kilograms | 720,000 | 784,000 | 819,000 | 881,000 | 759,000 | -- | -- |
| Iron ore ¹³ | | 2,030,000 ^r | 2,080,000 ^r | 2,230,000 ^r | 2,290,000 ^r | 2,290,000 ^e | 46,100 | 2.02 |
| Iron and steel: | | | | | | | | |
| Direct-reduced iron ¹⁴ | | 74,200 ^r | 73,000 ^r | 75,000 ^r | 74,600 ^r | 72,600 | 1,100 | 1.51 |
| Pig iron ¹⁵ | | 1,100,000 ^r | 1,120,000 ^r | 1,170,000 ^r | 1,190,000 ^r | 1,160,000 | 25,400 | 2.20 |
| Raw steel ^{15,16} | | 1,540,000 ^r | 1,570,000 ^r | 1,650,000 ^r | 1,670,000 ^r | 1,620,000 | 78,800 | 4.87 |
| Lead: | | | | | | | | |
| Mine, concentrates, Pb content | | 4,750 ^r | 5,080 ^r | 5,430 ^r | 5,440 ^r | 4,950 ^e | 367 ¹⁷ | 7.41 |
| Refinery ¹⁸ | | 10,300 ^r | 10,400 ^r | 10,700 ^r | 10,600 ^r | 10,400 ^e | 1,050 | 10.2 |
| Magnesium, primary ^{e,5} | metric tons | 806,000 ^r | 840,000 ^r | 909,000 ^r | 1,000,000 ^r | 972,000 | W | NA |
| Manganese ore, gross weight ¹⁹ | | 45,700 ^r | 46,400 ^r | 54,600 ^r | 58,000 ^r | 51,800 | -- | -- |
| Mercury, mine ⁵ | metric tons | 1,970 ^r | 1,830 ^r | 2,320 ^r | 2,750 ^r | 2,470 | NA | NA |
| Molybdenum, mine, Mo content | do. | 264,000 ^r | 256,000 ^r | 258,000 ^r | 268,000 ^r | 235,000 ^e | 47,400 | 20.1 |
| Nickel, Ni content: | | | | | | | | |
| Mine, recoverable | do. | 2,340,000 ^r | 2,570,000 ^r | 2,790,000 ^r | 2,350,000 ^r | 2,280,000 | 27,200 ²⁰ | 1.19 |
| Plant | do. | 1,630,000 ^r | 1,810,000 ^r | 1,980,000 ^r | 2,000,000 ^r | 1,930,000 | -- | -- |
| Niobium (columbium) concentrates, Nb content | do. | 50,200 ^r | 62,700 ^r | 57,100 ^r | 68,600 ^r | 64,300 ^e | -- | -- |
| Platinum-group metals: | | | | | | | | |
| Palladium | kilograms | 216,000 ^r | 206,000 ^r | 204,000 ^r | 193,000 ^r | 215,000 | 12,500 ²¹ | 5.82 |
| Platinum | do. | 202,000 ^r | 181,000 ^r | 191,000 ^r | 146,000 ^r | 189,000 | 3,670 ²¹ | 1.94 |
| Other ^e | do. | 72,700 | 66,000 ^r | 66,900 ^r | 51,600 ^r | 69,300 | -- | -- |
| Rare earths, rare-earth-oxide (REO) equivalent^e | | | | | | | | |
| Rhenium ^e | kilograms | 104,000 | 106,000 ^r | 107,000 | 125,000 ^r | 130,000 | 5,900 | 4.55 |
| Selenium, refinery, Se content ^{e,5} | metric tons | 46,700 ^r | 50,900 ^r | 46,600 ^r | 47,000 ^r | 49,400 | 7,900 ²² | 16.0 |
| Silver, mine ²³ | do. | 2,180 ^r | 2,220 ^r | 2,170 ^r | 2,250 ^r | 2,200 | W | NA |
| Tantalum concentrates, Ta content | kilograms | 23,600 ^r | 24,600 ^r | 25,600 ^r | 27,000 ^r | 27,600 ^e | 1,090 | 3.96 |
| Tin, Sn content: | | | | | | | | |
| Mine ²³ | metric tons | 916,000 ^r | 1,010,000 ^r | 1,290,000 ^r | 1,440,000 ^r | 1,210,000 ^e | -- | -- |
| Smelter ²⁴ | do. | 315,000 ^r | 249,000 ^r | 260,000 ^r | 285,000 ^r | 289,000 | -- | -- |
| | | 344,000 | 338,000 | 336,000 ^r | 392,000 ^{r,e} | 350,000 ^e | 10,500 ^e | 3.00 |

See footnotes at end of table.

TABLE 9—Continued
WORLD AND U.S. PRODUCTION OF SELECTED NONFUEL MINERAL COMMODITIES¹

(Thousand metric tons unless otherwise specified)

| Commodity | | World total | | | | | United States | |
|---|-----------------|-------------------------|------------------------|-------------------------|--------------------------|-------------------------|----------------------------|------------------------|
| | | 2011 | 2012 | 2013 | 2014 | 2015 | 2015 | Percent of world total |
| Metals:—Continued | | | | | | | | |
| Titanium mineral concentrates: | | | | | | | | |
| Ilmenite and leucoxene | | 7,330 ^r | 7,340 ^r | 7,690 ^r | 7,400 ^r | 7,270 ^e | 300 ^{e,25} | 4.13 |
| Rutile ⁵ | metric tons | 800,000 ^r | 791,000 ^r | 631,000 ^r | 553,000 ^r | 850,000 ^e | W | NA |
| Tungsten, W content ⁵ | do. | 73,900 | 76,900 ^r | 83,800 ^r | 87,000 ^r | 89,400 ^e | NA | NA |
| Vanadium, V content ²⁶ | do. | 71,500 | 74,900 | 80,400 | 82,600 ^r | 77,800 ^e | -- | -- |
| Zinc: | | | | | | | | |
| Mine, Zn content of concentrate and direct shipping ore | | 12,500 ^r | 12,900 ^r | 13,100 ^r | 13,300 ^r | 12,800 ^e | 825 ¹⁷ | 6.45 |
| Smelter | | 13,100 ^r | 12,600 ^r | 13,000 ^r | 13,500 ^r | 13,900 | 172 ^e | 1.24 |
| Zirconium mineral concentrates, gross weight | | 1,660 ^{r,5} | 1,420 ^{r,5} | 1,070 ^{r,5} | 1,620 ^{r,5} | 1,520 ^e | 80 ²⁷ | 5.25 |
| Industrial minerals: | | | | | | | | |
| Asbestos, marketable fiber | | 2,000 ^r | 2,020 | 2,050 | 2,030 ^r | 2,030 ^e | -- | -- |
| Barite ^e | | 8,370 ^r | 9,220 ^r | 8,240 ^r | 8,390 ^r | 7,410 | 425 ^{28,29} | 5.74 |
| Boron minerals ⁵ | | 8,150 ^r | 5,910 ^r | 6,030 ^r | 9,400 ^r | 9,380 ^e | W | NA |
| Bromine ^{e,5} | metric tons | 380,000 ^r | 357,000 ^r | 389,000 ^r | 409,000 ^r | 342,000 | W | NA |
| Celestite | do. | 379,000 ^r | 376,000 ^r | 344,000 ^r | 350,000 ^r | 354,000 ^e | -- | -- |
| Cement, hydraulic ^e | | 3,630,000 ^r | 3,820,000 ^r | 4,070,000 ^r | 4,190,000 ^r | 4,100,000 | 84,940 ^{28,30,31} | 2.07 |
| Clay: | | | | | | | | |
| Bentonite | | 15,400 ^r | 17,400 ^r | 16,700 ^r | 18,200 ^r | 19,700 ^e | 4,040 | 20.5 |
| Fuller's earth | | 3,170 ^r | 3,350 ^r | 3,480 ^r | 3,400 ^r | 3,430 ^e | 1,930 ³² | 56.3 |
| Kaolin | | 32,300 ^r | 31,600 ^r | 33,000 ^r | 35,400 ^r | 35,600 ^e | 5,990 | 16.8 |
| Diamond, natural ³³ | thousand carats | 123,000 | 128,000 | 130,000 | 125,000 | 127,000 | -- | -- |
| Diatomite ^{e,34} | | 2,350 ^r | 2,550 ^r | 2,640 ^r | 2,740 ^r | 2,670 | 832 ^{28,29} | 31.2 |
| Feldspar | | 21,200 ^r | 20,700 ^r | 22,000 ^r | 23,000 ^r | 22,300 ^e | 520 ^{e,35} | 2.33 |
| Fluorspar ³⁶ | | 9,080 ^r | 6,870 ^r | 6,330 ^r | 6,720 ^r | 6,670 ^e | -- | -- |
| Graphite, natural ^e | | 1,180 | 1,210 | 1,150 | 1,160 | 1,160 | -- | -- |
| Gypsum | | 241,000 ^r | 243,000 ^r | 252,000 ^r | 261,000 ^r | 261,000 ^e | 15,200 ³⁷ | 5.83 |
| Iodine, crude ^{e,5} | metric tons | 26,200 | 27,800 | 30,800 | 29,600 ^r | 30,600 | W | NA |
| Kyanite and related minerals ^e | do. | 357,000 | 333,000 | 370,000 ^r | 382,000 ^r | 408,000 | 108,000 ³⁸ | 26.5 |
| Lime ³⁹ | | 330,000 ^{r,40} | 340,000 ⁴⁰ | 350,000 ^{r,40} | 350,000 ^{r,40} | 350,000 ^{r,40} | 18,300 ³⁰ | 5.23 |
| Magnesite ^{e,5,41} | | 27,700 ^r | 24,200 ^r | 25,400 ^r | 29,400 ^r | 27,700 | W | NA |
| Mica | metric tons | 1,100,000 ^r | 1,080,000 ^r | 1,130,000 ^r | 1,140,000 ^{r,e} | 1,120,000 ^e | 32,600 ⁴² | 2.90 |
| Monazite concentrates, gross weight | do. | 9,320 ^r | 3,890 ^r | 4,250 ^r | 6,570 ^r | 6,860 | -- | -- |
| Nitrogen, N content of ammonia ^e | | 138,000 ^r | 138,000 ^r | 144,000 ^r | 140,000 ^r | 145,000 | 9,590 ^{28,43} | 6.62 |
| Peat | | 30,000 ^r | 27,500 ^r | 30,900 ^r | 28,200 ^r | 27,500 ^e | 455 ⁴⁴ | 1.65 |
| Perlite, processed ore | metric tons | 4,590,000 ^r | 4,400,000 ^r | 4,340,000 ^r | 4,330,000 ^r | 4,380,000 ^e | 459,000 ²⁹ | 10.5 |
| Phosphate rock, gross weight | | 200,000 ^r | 216,000 ^r | 232,000 ^r | 237,000 ^r | 242,000 ^e | 27,400 ²⁹ | 11.3 |
| Potash, marketable, K ₂ O equivalent | | 35,800 ^r | 32,800 ^r | 35,600 ^r | 40,800 ^r | 40,700 ^e | 740 ⁴⁰ | 1.82 |
| Pumice and related materials | | 18,400 ^r | 15,300 ^r | 15,100 ^r | 16,900 ^r | 16,900 ^e | 310 ²⁹ | 1.83 |
| Salt, all forms | | 273,000 ^r | 261,000 ^r | 273,000 ^r | 273,000 ^r | 270,000 ^e | 45,100 ^{30,45} | 16.7 |
| Sand and gravel, industrial, silica | | 126,000 | 130,000 | 147,000 | 195,000 ^{r,e} | 189,000 ^e | 103,000 ²⁹ | 54.6 |
| Soda ash, natural and manufactured ^e | | 50,000 ^r | 51,700 ^r | 51,300 ^r | 52,700 ^r | 53,400 | 11,600 ^{28,46} | 21.7 |
| Sulfur, all forms ⁴⁷ | | 69,900 ^r | 69,800 ^r | 68,000 ^r | 69,100 ^r | 69,500 | 9,540 | 13.7 |
| Talc and pyrophyllite | | 7,780 ^r | 7,830 ^r | 8,550 ^r | 8,370 ^r | 8,430 ^e | 687 ⁴⁸ | 8.15 |
| Vermiculite | metric tons | 394,000 ^r | 370,000 ^r | 378,000 ^r | 395,000 ^r | 410,000 ^e | 100,000 ^{e,29,49} | 24.4 |

^eEstimated. ^rRevised. do. Ditto. NA Not available. W Withheld to avoid disclosing company proprietary data; not included in "World total." -- Zero.

¹Data are rounded to no more than three significant digits, unless otherwise specified.

²Calcined alumina or the total of calcined alumina plus the calcined equivalent of hydrate.

³Primary aluminum is defined as "The weight of liquid aluminum as tapped from pots, excluding the weight of any alloying materials as well as that of any metal produced from either returned scrap of remelted material."

⁴Includes calculated arsenic trioxide equivalent of output of elemental arsenic compounds other than arsenic trioxide; inclusion of such materials would not duplicate reported arsenic trioxide production.

⁵"World totals" do not include U.S. production.

TABLE 9—Continued
WORLD AND U.S. PRODUCTION OF SELECTED NONFUEL MINERAL COMMODITIES¹

(Thousand metric tons unless otherwise specified)

- ⁶Beryl ore for the production of beryllium and excludes gem-quality beryl. U.S. production is mine shipments; includes bertrandite ore, calculated as equivalent to beryl containing 11% beryllium oxide.
- ⁷Includes unwrought production from ores, concentrates, flue dusts, and other materials of both domestic and imported origin.
- ⁸Recoverable cobalt content of ores, concentrates, or intermediate products from cobalt, copper, nickel, platinum, or zinc operations. U.S. production is cobalt content of concentrates.
- ⁹Cobalt refined from ores, concentrates, or intermediate products and does not include production of downstream products from refined cobalt.
- ¹⁰Copper content of concentrates produced (includes cement copper). U.S. production includes concentrates and electrowon leaching.
- ¹¹Includes total production of smelted copper metal, including low-grade cathode produced by electrowinning methods. The smelter feed may be derived from ore, concentrates, copper precipitate or matte (primary), and (or) scrap (secondary). U.S. production is primary only.
- ¹²Includes total production of refined copper whether produced by pyrometallurgical or electrolytic refining methods and whether derived from primary unrefined copper or from scrap. Copper cathode derived from electrowinning processing is also included. U.S. production is secondary only.
- ¹³Production of usable ore represents total for all iron ore products used in steelmaking.
- ¹⁴Sources: Midrex Technologies, Inc., governments, and companies.
- ¹⁵Source: American Iron and Steel Institute (AISI).
- ¹⁶Raw steel is defined by AISI as steel formed in solid state after melting, suitable for further processing or sale.
- ¹⁷Total content of ores and concentrates. Table 1 reports recoverable content.
- ¹⁸Total output of refined lead whether derived from ores and concentrates (primary) or scrap (secondary), and include the lead content of antimonial lead but does not include, to the extent possible, simple remelting of scrap.
- ¹⁹Mostly concentrates or comparable shipping product.
- ²⁰Recoverable content of nickel sulfide concentrates.
- ²¹Excludes that produced as a byproduct from gold-copper ores.
- ²²Based on 80% recovery of estimated rhenium contained in molybdenum disulfide concentrates.
- ²³Recoverable content of ores and concentrates.
- ²⁴Includes primary production (from ores and concentrates) and secondary production (recovered from scrap). U.S. production is secondary only.
- ²⁵Includes U.S. production, rounded to one significant digit, of ilmenite, leucoxene, and rutile to avoid disclosing company proprietary data.
- ²⁶Production from ores, concentrates, and slag.
- ²⁷Rounded to no more than one significant digit.
- ²⁸Reported figure.
- ²⁹Sold or used by producers and (or) marketable production.
- ³⁰Includes Puerto Rico.
- ³¹Portland and masonry cements only. Includes a small (less than 0.3% per year) component of double-counting where portland cement (not clinker) is consumed to make masonry cement; the precise amount of double-counting cannot be determined because of the involvement of portland cement stockpiles. U.S. data are unrounded.
- ³²Does not include attapulgit.
- ³³Includes gem and industrial. Source: Kimberley Process Certification Scheme.
- ³⁴Purity and moisture content are generally not reported or estimated.
- ³⁵Includes hand-cobbed feldspar, flotation-concentrate feldspar, feldspar in feldspar-quartz mixtures, and aplite; predominantly in the production of ceramics and glass. Rounded to two significant digits.
- ³⁶Includes production by grade (acid, ceramic, and metallurgical).
- ³⁷Does not include byproduct gypsum.
- ³⁸Does not include synthetic mullite. Estimated using several prior-years' output as reported to the Virginia Department of Mines.
- ³⁹Quicklime, hydrated lime, and dead-burned dolomite.
- ⁴⁰Rounded to no more than two significant digits.
- ⁴¹Crude salable magnesite.
- ⁴²Includes scrap and flake. Does not include, if any, U.S. production of low-quality sericite and sheet mica.
- ⁴³Synthetic anhydrous ammonia; does not include coke oven byproduct ammonia.
- ⁴⁴Production. Table 1 reports sales by producers.
- ⁴⁵Includes brine, rock, solar, and vacuum and open pans.
- ⁴⁶U.S. production is natural only.
- ⁴⁷Byproduct. Includes Frasch, metallurgy, native, natural gas, oil sands, petroleum, and pyrite.
- ⁴⁸Does not include pyrophyllite.
- ⁴⁹Rounded to the nearest 100,000 metric tons.