



2017 Minerals Yearbook

SILVER [ADVANCE RELEASE]

SILVER

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In 2017, the United States produced 1,030 metric tons (t) of silver, which was 10% less than revised production in 2016 (table 1). Silver was produced in 11 States in 2017, and Alaska remained the leading silver-producing State, followed by Nevada, Arizona, Utah, and Idaho in descending order of production. Approximately 45% of domestic silver production was produced from primary silver ore at 4 mines, whereas 43% of domestic silver was produced from base-metal ores at 9 mines, and the remaining 12% was from gold ores at 12 mines (table 3). Hecla Mining Co.'s Greens Creek Mine, for data collection purposes, had been considered a primary zinc mine up to 2016, when it was redesignated a primary silver mine bringing the classification into alignment with Hecla's and Mine Safety and Health Administration reporting.

The Engelhard price of silver averaged \$17.07 per troy ounce in 2017, a slight decrease compared with the 2016 average price of \$17.20 per troy ounce (table 1).

Traditional use categories for silver included coin and medal fabrication; industrial applications such as brazing alloys and solders, electrical and electronics components, ethylene oxide, photography, and photovoltaics; jewelry; non-coin investments; and silverware. In 2017, global use of silver decreased slightly compared with that of 2016. Apart from coins and bars, ethylene oxide, and photography (which decreased by 27%, 32%, and 3%, respectively), silver use in all other categories increased in 2017. Photovoltaics and silverware increased by 19% and 11%, respectively (O'Connell and others, 2018, p. 8).

In 2017, silver was mined in approximately 65 countries. Production was 27,800 t, essentially unchanged from revised production of 27,900 t in 2016 (tables 1, 8). Mexico was the leading producer, followed by Peru, China, Russia, and Poland. These five countries accounted for 62% of the global production of silver. The United States ranked ninth in world silver mine production in 2017.

Legislation and Government Programs

On September 30, 2017, the amount and value of Deep Storage and Working Stock custodial silver reserves held by the U.S. Mint were 498 t with a total market value of \$270 million at \$16.86 per fine troy ounce and a statutory value of \$20.7 million. As custodian, the U.S. Mint is responsible for safeguarding much of the Nation's gold and silver. In accordance with 31 U.S. Code §5117(b) and 31 U.S. Code §5116(b)(2), a statutory rate of no less than \$1.292929292 per fine troy ounce was used to value the custodial silver held by the U.S. Mint. Total silver bullion ounces sold decreased by 46% in fiscal year 2017 when compared with fiscal year 2016. Sales of American Eagle silver bullion coins and America the Beautiful silver bullion coins decreased by 46% and 47%, respectively (U.S. Mint, 2018, p. 14, 43).

Production

Domestic lode mine production data for silver were compiled by the U.S. Geological Survey from two separate voluntary monthly surveys of U.S. mining operations and from publicly available sources and represented 100% of U.S. mine production listed in table 1. Domestic mine production of silver decreased by 10% in 2017 to 1,030 t, primarily because of decreased production at the Lucky Friday Mine in Idaho. Silver in the United States was mainly produced as a principal product at the Galena Complex, Greens Creek, Lucky Friday, and Rochester Mines, with mine production of about 3%, 25%, 3%, and 14%, respectively (based on company reports), of 2017 U.S. silver production.

Hecla's Lucky Friday Mine, an underground silver-lead-zinc mine in the Coeur d'Alene mining district in northern Idaho, produced 77% less silver in 2017 than in 2016 as a result of a worker's strike that started on March 13 and continued through the remainder of the year. The mill operated intermittently during the strike (Hecla Mining Co., 2018, p. HL10-K19 to HL10-K21). Silver production at the Greens Creek Mine on Admiralty Island near Juneau, AK, was 260 t, a decrease of almost 10% compared with 2016 production, owing to a lower average silver ore grade. The expansion of the tailings facility at the Greens Creek Mine continued through 2017 (Hecla Mining Co., 2018, p. HL10-K32).

Coeur Mining, Inc.'s Rochester Mine near Lovelock, NV, a silver surface mine with gold byproduct, produced 147 t of silver in 2017, 3% more than 2016 production. Higher silver recovery rates and timing of leach pad recoveries more than offset the decrease in ore mined (Coeur Mining, Inc., 2018, p. 30, 45).

In 2017, Alaska produced 514 t of silver, of which 239 t was produced at the Red Dog Mine in northwest Alaska, primarily a zinc-lead mine, a 5% increase compared with 228 t in 2016. The grade from the Aqqualuk pit decreased early in the year and was supplemented by the higher grade ore from the Qanalyaq pit (Athey and Werdon, 2018, p. 61, 66).

The Galena Complex silver mine, near Silverton, ID, owned by Americas Silver Corp., produced 35 t of silver in 2017 compared with 43 t in 2016, a decrease of 19% (Americas Silver Corp., 2018, p. 12).

Consumption

Consumption of silver for fabrication (excluding silver bars) in the United States was 5,340 t in 2017, an 8% decrease from that of the 2016. Declines in silver consumption for coins and medals more than offset increases in consumption for industrial applications and jewelry (O'Connell and others, 2018, p. 52, 73, 76, 84).

Coin and Medal Fabrication.—Approximately 610 t of silver was consumed for coins and medals in the United States in

2017, a 50% decrease from 1,220 t in 2016. In fiscal year 2017, the U.S. Mint sold 718 t of American Eagle silver bullion coins, a decrease of 46% from 1,320 t in 2016, and the sales of America the Beautiful silver bullion coins decreased by 47% in 2017 to 28 t from 52 t in 2016. The silver consumed in coins was the lowest level since 2008 (O'Connell and others, 2018, p. 24–25; U.S. Mint, 2018, p. 14).

Industrial Applications.—Silver consumed in domestic industrial applications increased for a third year in a row after 4 years of decreases. Approximately 4,210 t of silver was used in the United States in 2017 for industrial applications, a slight increase from 4,140 t in 2016 (O'Connell and others, 2018, p. 52, 54).

The principal components of industrial demand for silver were brazing alloys and solders, catalysts, electrical components and electronics, photography, photovoltaics, and other applications. Adding silver to solder or brazing alloys helps produce smooth, leak-tight, and corrosion-resistant joints. Silver brazing alloys were used widely in a variety of applications, including air conditioning and refrigeration, and electric power distribution. They also were important in the aerospace and automobile industries. In 2017, about 192 t of silver was used domestically in brazing alloys and solders, slightly more than in 2016 (O'Connell and others, 2018, p. 62).

As a catalyst, silver can be used in the form of mesh screens or crystals to produce ethylene oxide and formaldehyde, both of which are essential ingredients in plastics. Approximately 90% of the silver used as an industrial catalyst was for the production of ethylene oxide from ethylene. Aside from plastics, ethylene oxide was used for antifreeze, detergents, and polyester fiber. Ethylene oxide catalyst use in the United States increased by 59% in 2017 to 27 t from 17 t owing to the commissioning of two new plants (O'Connell and others, 2018, p. 60, 89).

In 2017, the domestic use of silver for electronic and electrical applications totaled 1,730 t, a slight increase from 1,720 t in 2016 (O'Connell and others, 2018, p. 58). One of silver's electrical applications is in batteries. The most common silver-oxide battery was the small button-cell battery used in calculators, cameras, hearing aids, toys, and watches; the batteries contain about 35% silver by weight. Because of environmental and safety concerns, silver-oxide batteries were beginning to replace lithium-ion batteries in mobile phones and laptop computers. Silver-zinc batteries feature a water-based chemistry and contain no lithium or flammable liquids. Some larger silver-oxide and silver-zinc batteries were used in military applications. Silver also was used in conductors, contacts, fuses, switches, and timers (Silver Institute, The, undated).

Silver membrane switches were used in buttons on electronics such as computer keyboards, microwave ovens, telephones, televisions, and toys. Silver-based inks and films were applied to composite boards to create electrical pathways in printed circuit boards. Silver-based inks also were used in radio frequency identification (RFID) tags used in hundreds of millions of products to prevent theft and allow easy inventory control (Silver Institute, The, undated).

The use of silver in automotive manufacturing is increasing in autonomous vehicles, internal combustion engines, and photovoltaics, producing new applications in the industry.

Almost all contacts in automobiles are silver coated. Silver membrane switches are used for various functions in vehicles, such as opening windows, closing the trunk, and starting the engine. Growth in demand for automobiles in developing countries is expected to increase silver consumption (O'Connell and others, 2018, p. 61).

In 2017, global silver powder production increased to 2,930 t from 2,470 t, an increase of 19%, with Japan (1,840 t), the United States (558 t), and China (535 t) the leading producers. Silver paste manufactured from silver powder, is used in the fabrication of crystalline silicon photovoltaic solar panels, the most commonly used type of solar panel. Solar panel production increased by 370% in China in 2017 compared with that in 2016. During the same period, installations in India nearly doubled to 8 gigawatts and those in Europe increased by 28% (Turkey contributing 1.79 gigawatts). Although installations in the United States decreased by 17% to 12.1 gigawatts, it still accounted for 13% of world installations. In 2017, the average silver loading per cell was 0.13 grams, but increased cell efficiency could adversely affect future consumption of silver. Most silver paste was produced in China, the Republic of Korea, Taiwan, and the United States. In 2017, Taiwan and the United States produced 64% of global silver paste, whereas China produced 13%; however, China produced about 70% of the solar cells (O'Connell and others, 2018, p. 64–66).

Silver was one of the essential materials used in the manufacture of photographic films and papers. The decline in the use of silver for photography began in 2000 in response to the growth in digital camera technology and the decline in the production of color film and paper. The use of silver in film and paper for consumer applications declined more rapidly than its use in motion picture film because of the slower adoption of digital formats in motion picture production. Other broad photographic-use categories for silver-containing film and paper included commercial photography, dental and industrial x-ray film, graphic arts, and medical x-ray film. In 2017, domestic use of silver for photographic applications was 426 t, a 4% decrease from 442 t in 2016 (O'Connell and others, 2018, p. 62–64).

Dental amalgam contains silver, but its use is declining because of concerns about its mercury content (U.S. Food and Drug Administration, 2015). Owing to silver's antibacterial properties, silver also was used in such products as clothing, laundry machines, shoes, and toothbrushes. Silver embedded in locker room surfaces was used to reduce staph infections, and silver-based disinfectants have been introduced as a low-cost, environmentally sensitive option for use in care centers and food-processing facilities (Silver Institute, The, undated).

Jewelry and Silverware.—In 2017, U.S. consumption of silver for fabrication of jewelry and silverware was 519 t, an 11% increase compared with the 468 t consumed in 2016. Silver consumption for jewelry increased to 495 t, 12% more than that in 2016, and consumption for silverware was unchanged at 25 t (O'Connell and others, 2018, p. 73, 76).

World consumption of silver for jewelry increased slightly in 2017 to 6,503 t from 6,376 t, mainly because of consumption in India. Consumption for jewelry in India increased by 7% to 2,060 t from 1,930 t, and there was an increase in stockpiling of silver before the Goods and Services Tax (GST) was instituted

in midyear. Chinese consumption decreased by 5% from a year earlier to 830 t (O'Connell and others, 2018, p. 70–74).

Prices and Stocks

From January 1 to December 31, 2017, there was an overall increase in silver prices of 6% compared with a 14% increase in 2016. The daily average Engelhard silver price yearly high was \$18.56 per troy ounce on April 13 and the yearly low was \$15.34 per troy ounce on July 10. The daily average price per troy ounce of silver was \$17.07, a slight decrease when compared with the daily average price of silver in 2016 (table 1).

Foreign Trade

U.S. exports of silver content bullion, dore, and ores and concentrates decreased by 45% to 157 t in 2017 from 289 t in 2016. Principal destinations were Canada (36%), Switzerland (9%), and India (8%) (table 4). U.S. imports for consumption of content bullion, dore, and ores and concentrates decreased by 18% to 5,050 t in 2017 from 6,160 t in 2016. The principal import sources were Mexico (49%), Canada (23%), and Peru (6%) (table 6). The main reason for the decline in imports was the decrease in domestic investment demand for silver (O'Connell and others, 2018, p. 47).

World Review

World mine production of silver decreased for the second consecutive year to 27,800 t in 2017, essentially unchanged from the revised figure of 27,900 t in 2016. Mexico continued to be the leading producer of silver, accounting for 22% of world production. Mexico was followed by Peru (16%); China (13%); Russia (7%); Chile and Poland (5% each); Argentina, Australia, Bolivia, and the United States (4% each); Morocco (3%); and Guatemala, India, Kazakhstan, and Sweden (2% each). These 15 countries accounted for about 93% of the global silver production. Silver production increased in Mexico (by 700 t); other countries with increases in production (in descending order) were Morocco (534 t), Mongolia (91 t), India (81 t), Eritrea (37 t), Kazakhstan (27 t), and the Dominican Republic (25 t). World mine production decreased as a whole in 2017; the most notable decreases (in descending order) were in Chile (237 t), Australia (235 t), Guatemala (220 t), Poland (192 t), Russia (170 t), Turkey (127 t), the United States (117 t); Bolivia (110 t), Indonesia (86 t), and Peru (72 t) (table 8).

According to the Silver Institute, about 28% of global silver production was from silver ores, 36% from lead and zinc ores, 23% from copper ores, 12% from gold ores, and 1% from other types of mining operations. Silver scrap recycling declined slightly to 4,296 t, the sixth consecutive year of decline and the lowest level since 1996. The relatively lower silver prices reduced the incentive for suppliers and consumers to recycle scrap (O'Connell and others, 2018, p. 34, 42–44).

Global silver consumption decreased slightly to 31,650 t in 2017 from 32,410 t in 2016. Industrial applications, accounting for 59% of the total global consumption, were the leading end uses of silver, followed by jewelry (21%); bars, coins, and medals (15%); and silverware (5%). Apart from coins and bars, ethylene oxide, and photography (which decreased by 27%, 32%, and 3%, respectively), silver use in all other categories increased in 2017. Photovoltaics and silverware were the leading increases at 19% and 11%, respectively (O'Connell and others, 2018, p. 8).

Argentina.—In 2017, silver production in Argentina decreased by 4% to 1,016 t from 2016 owing to reduced production from SSR Mining Inc.'s Puna Operations, which produced 192 t in 2017, 41% less than compared with 2016 production. Mining at the San Miguel Pit ended in January 2017, and processing continued with lower grade stockpiled ore raising costs by 40%. Goldcorp Inc. increased production from its Cerro Negro operations with higher production rates offsetting slight decreases in recovery rates (O'Connell and others, 2018, p. 30; SSR Mining Inc., 2018).

Bolivia.—Silver production in Bolivia in 2017 was 1,243 t compared with 1,353 t in 2016, a decrease of 8% owing to decreased production at the San Bartolomé, San Cristobal, and San Vicente Mines (O'Connell and others, 2018, p. 30). During the year, the San Bartolomé Mine produced 133 t of silver. In December 2017, Coeur and its subsidiaries agreed to sell all of Empress Minera Manquiri, S.A. (the operator of the San Bartolomé Mine) to Ag-Mining Investments, AB, with the deal expected to be completed in early 2018 (Coeur Mining, Inc., 2018, p. 27). Production of silver at the San Vicente Mine was 112 t in 2017, a 19% decrease compared with 138 t in 2016 (Pan American Silver Corp., 2018, p. 35).

Canada.—Silver production in Canada was 395 t in 2017, a slight decrease from 405 t in 2016. Most of the silver in Canada was produced as a coproduct or byproduct of other metals in 34 mines. Vale's Sudbury operations produced less silver owing to reduced production at nickel-mining operations. Lower ore grades were cited for decreased silver production from the Kidd Creek (Glencore plc) copper-zinc mine, the Highland Valley (Teck Resources Ltd) copper-molybdenum mine, and the Minto (Capstone Mining Corp.) copper-gold-silver mine. Agnico Eagle Mines, Ltd.'s LaRonde gold-silver-copper-zinc mine produced 39 t of silver in 2017, a 27% increase compared with 31 t in 2016 (O'Connell and others, 2018, p. 29; Mining Association of Canada, The, 2019, p. 84–88).

China.—Silver production in China was 3,502 t in 2017, essentially unchanged from the revised amount in 2016. Silver in the country was produced as a byproduct of copper, lead, and zinc mining. Increased attention to environmental protection by the Government led to decreased lead and zinc production and resulted in a decrease of silver production (O'Connell and others, 2018, p. 33).

Mexico.—In 2017, Mexico was the leading producer of silver in the world with production of 6,109 t, a 13% increase from the revised production of 5,409 t in 2016. The increase in production was the result of increased production at the Peñasquito and San Julian Mines. Fresnillo plc's San Julian operations were commissioned in late 2016 and produced 328 t of silver in 2017. After a prolonged maintenance at Goldcorp Inc.'s Peñasquito mill, production in 2017 increased to 112 t, a 20% increase as compared with that of 2016 (O'Connell and others, 2018, p. 27).

Peru.—In 2017, Peru was the second leading producer of silver in the world with production of 4,304 t, a slight decrease from that in 2016. Buenaventura (803 t) was the leading producer, followed by Compañía Minera Antamina S.A. (647 t) and Volcan Compañía Minera S.A.A. (Volcan Compañía Minera S.A.A., 2018, p. 42). The leading silver producer was Compañía de Minas Buenaventura S.A.A. with production from the following

mines: Uchucchacua (516 t), El Brocal (127 t), Julcani (70 t), Tambomayo (56 t), and Mallay (35 t) (Compañía de Minas Buenaventura S.A.A., 2018). Volcan Compañía Minera S.A.A. and subsidiaries was the third leading producer of silver in Peru in 2017 with a production of 538 t; Hochschild Mining plc produced 493 t of silver from its Arcata (137 t), Inmaculada (171 t), and Pallancata (185 t) Mines (Hochschild Mining plc, 2018, p. 2, 24–26). In 2017, Compañía Minera Milpo S.A.A. produced 184 t of silver from the Cerro Lindo and El Porvenir Mines, 6% less than that produced in 2016 (Compañía Minera Milpo S.A.A., 2018, p. 14–15).

Russia.—In 2017, Russia produced about 2,030 t of silver, a decrease of 9% compared with 2,200 t from a year earlier. Polymetal International plc's output from the Dukat Mine, Russia's leading silver operation, produced 551 t of silver in 2017, a decrease of 65 t from 2016 owing to lower ore grades. At the Lunnoye Mine, ore throughput increased by 6%, but the silver output fell by 25 t because of lower silver ore grades (O'Connell and others, 2018, p. 33).

Outlook

World production of silver is expected to increase, as output from gold and primary silver mines in Mexico and South America increases. The use of silver in photographic applications is expected to continue to decline, and as hospitals convert their x-ray equipment to digital systems, silver use will probably remain only in niche applications such as artistic photography.

The use of silver in crystalline silicon photovoltaic cells is expected to increase as production increases, although, per solar cell, silver use is expected to decline owing to the relatively high cost of silver. The demand for silver from the electrical and electronics industry is expected to increase in 2018 because of technological improvements. New uses for silver include those that take advantage of its biocidal or conductive properties. Antimicrobial silver technology is expected to be used in cooking utensils, food packaging, medical products, textiles, toiletries, and water-purification devices. The use of RFIDs for tracking shipments and stocks, including silver-based high-data-capacity tags, readers, and computer systems, is expected to increase. Although silver-oxide batteries are already used in many products, demand for the batteries may increase with the proliferation of laptop and tablet computers and cellular telephones with advanced computing capabilities.

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TABLE 1
SALIENT SILVER STATISTICS¹

| | | 2013 | 2014 | 2015 | 2016 | 2017 |
|--|------------------------|---------------------|---------------------|---------------------|------------------------|-----------|
| United States: | | | | | | |
| Mine production: | | | | | | |
| Quantity | metric tons | 1,050 | 1,180 | 1,090 | 1,150 | 1,030 |
| Value | thousands | \$804,000 | \$727,000 | \$551,000 | \$627,000 ^r | \$566,000 |
| Refinery production: | | | | | | |
| Domestic and foreign ores and concentrates | metric tons | 800 | 800 | 800 | 800 | 800 |
| Scrap (old and new) | do. | 1,700 | 1,400 | 1,200 | 1,300 | 1,300 |
| Exports: | | | | | | |
| Ore and concentrate | do. | 14 | 6 | 2 | 16 | 16 |
| Bullion and dore | do. | 395 | 374 | 815 | 273 | 141 |
| Imports for consumption: | | | | | | |
| Ore and concentrate ² | do. | 57 | (3) | (3) ^r | 5 | 7 |
| Bullion and dore | do. | 5,020 | 5,000 | 5,930 | 6,160 | 5,040 |
| Stocks, December 31: | | | | | | |
| Industry | do. | 110 | 120 | 130 | 140 | 150 |
| COMEX | do. | 5,350 | 5,610 | 5,000 | 5,710 | 7,570 |
| U.S. Department of the Treasury | do. | 498 | 498 | 498 | 498 | 498 |
| Bullion coin production ⁴ | do. | 1,390 | 1,210 | 1,520 | 1,370 | 746 |
| Price, average ⁵ | dollars per troy ounce | 23.89 | 19.09 | 15.72 | 17.20 ^r | 17.07 |
| Employment, mine and mill workers ⁶ | | 819 | 792 | 750 | 785 | 1,030 |
| World, mine production | metric tons | 26,700 ^r | 27,800 ^r | 27,400 ^r | 27,900 ^r | 27,800 |

^rRevised. do. Ditto.

¹Table includes data available through April 27, 2020. Data are rounded to no more than three significant digits, except prices.

²Includes silver content of ash and residues.

³Less than ½ unit.

⁴Data from the U.S. Mint.

⁵Price data are the annual Handy & Harman quotations published in Platts Metals Week.

⁶Employment data are from the U.S. Department of Labor, Mine Safety and Health Administration, for mines classified as (active and temporarily idle) silver mines by the U.S. Geological Survey.

TABLE 2
MINE PRODUCTION OF SILVER IN THE UNITED STATES, BY STATE¹

(Kilograms)

| State | 2015 | 2016 | 2017 |
|--------------------|----------------------|----------------------|-----------|
| Alaska | 490,000 | 520,000 | 514,000 |
| Arizona | 99,200 | 86,700 | 78,900 |
| Nevada | 290,000 | 278,000 | 265,000 |
| Other ² | 211,000 ^r | 264,000 ^r | 173,000 |
| Total | 1,090,000 | 1,150,000 | 1,030,000 |

^rRevised.

¹Table includes data available through April 27, 2020. Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes California, Colorado, Idaho, Missouri, Montana, New Mexico, South Dakota, and Utah.

TABLE 3
LEADING SILVER-PRODUCING MINES IN THE UNITED STATES IN 2017, IN ORDER OF OUTPUT¹

| Rank | Mine | County and State ² | Operator | Source of silver |
|------|-------------------------|--------------------------------|--|------------------------|
| 1 | Greens Creek | Southeastern Region, AK | Hecla Mining Co. | Silver-zinc ore. |
| 2 | Red Dog | Northern Region, AK | Teck Alaska Inc. | Zinc-lead ore. |
| 3 | Rochester | Pershing, NV | Coeur Mining, Inc. | Silver ore. |
| 4 | Bingham Canyon | Salt Lake, UT | Rio Tinto Kennecott ³ | Copper-molybdenum ore. |
| 5 | Mission Complex | Pima, AZ | ASARCO LLC ⁴ | Copper ore. |
| 6 | Phoenix | Lander, NV | Newmont Mining Corp. | Gold-copper ore. |
| 7 | Galena Complex | Shoshone, ID | Americas Silver Corp. | Silver ore. |
| 8 | Round Mountain | Nye, NV | Kinross Gold Corp. | Gold ore. |
| 9 | Lucky Friday | Shoshone, ID | Hecla Mining Co. | Silver ore. |
| 10 | Midas | Elko, NV | Klondex Mining Ltd. | Gold ore. |
| 11 | Bagdad | Yavapai, AZ | Freeport-McMoRan Inc. | Copper-molybdenum ore. |
| 12 | Continental Pit | Silver Bow, MT | Montana Resources LLP | Do. |
| 13 | Chino | Grant, NM | Freeport-McMoRan Inc. | Do. |
| 14 | Morenci | Greenlee, AZ | do. | Do. |
| 15 | Carlin Mines Operations | Elko, Eureka, and Humboldt, NV | Newmont Mining Corp. | Gold ore. |
| 16 | Pinto Valley | Gila, AZ | Capstone Mining Corp. | Copper-molybdenum ore. |
| 17 | Soledad Mountain | Kern, CA | Golden Queen Mining Co. Ltd. (50%), Jefferies Financial Group (37.73%), Auvergne, LLC (12.27%) | Gold ore. |
| 18 | Rawhide | Mineral, NV | Coral Reef Capital L.L.C. | Do. |
| 19 | Goldstrike | Elko and Eureka, NV | Barrick Gold Corp. | Do. |
| 20 | Ray | Pinal, AZ | ASARCO LLC ⁴ | Copper ore. |
| 21 | Cortez Operations | Eureka and Lander, NV | Barrick Gold Corp. | Gold ore. |
| 22 | Bald Mountain | White Pine, NV | Kinross Gold Corp. | Do. |
| 23 | Fire Creek | Lander, NV | Klondex Mining Ltd. | Do. |
| 24 | Wharf | Lawrence, SD | Coeur Mining, Inc. | Do. |
| 25 | Hollister | Elko, NV | Klondex Mining Ltd. | Do. |

Do., do. Ditto.

¹Table includes data available through April 27, 2020. The mines on this list accounted for more than 99% of U.S. mine production in 2017.

²For Alaska, mines are located by geographic region, as delineated by the Alaska Division of Geological & Geophysical Surveys in its Special Report 73, Alaska's mineral industry 2017.

³Wholly owned subsidiary of Rio Tinto plc.

⁴Wholly owned subsidiary of Grupo México, S.A.B. de C.V.

TABLE 4
U.S. EXPORTS OF REFINED SILVER, BY COUNTRY OR LOCALITY¹

| Year and country or locality | Ores and concentrates | | Bullion | | Dore | | Total | |
|------------------------------|-------------------------------|----------------------|-------------------------------|----------------------|-------------------------------|----------------------|-------------------------------|----------------------|
| | Silver content (kilograms) | Value (thousands) | Silver content (kilograms) | Value (thousands) | Silver content (kilograms) | Value (thousands) | Silver content (kilograms) | Value (thousands) |
| 2016 | 15,900 | \$27,500 | 237,000 | \$139,000 | 35,800 | \$21,300 | 289,000 | \$188,000 |
| 2017: | | | | | | | | |
| Argentina | -- | -- | -- | -- | 50 | 28 | 50 | 28 |
| Australia | 3 | 17 | 7,620 | 4,280 | 441 | 199 | 8,060 | 4,490 |
| Canada | 308 | 699 | 55,700 | 32,700 | -- | -- | 56,000 | 33,400 |
| Cayman Islands | -- | -- | 1,960 | 1,230 | -- | -- | 1,960 | 1,230 |
| Chile | 13 | 6 | 2,420 | 1,720 | -- | -- | 2,430 | 1,720 |
| China | 9,020 | 7,560 | 40 | 16 | 22 | 13 | 9,080 | 7,590 |
| Germany | -- | -- | 5,380 | 2,670 | 3,070 | 1,810 | 8,450 | 4,480 |
| Hong Kong | -- | -- | 136 | 160 | 433 | 329 | 569 | 489 |
| India | -- | -- | 2,000 | 1,200 | 11,100 | 8,950 | 13,100 | 10,200 |
| Israel | -- | -- | -- | -- | 263 | 163 | 263 | 163 |
| Italy | -- | -- | 3,750 | 2,380 | 1,130 | 645 | 4,880 | 3,020 |
| Japan | 133 | 532 | 36 | 111 | -- | -- | 169 | 643 |
| Korea, Republic of | 6,680 | 17,900 | 20 | 13 | 410 | 238 | 7,110 | 18,100 |
| Mexico | -- | -- | 3,470 | 1,950 | 3,250 | 2,920 | 6,720 | 4,880 |
| New Zealand | -- | -- | 693 | 407 | 987 | 510 | 1,680 | 917 |
| Norway | -- | -- | 74 | 33 | 1,120 | 706 | 1,190 | 739 |
| Panama | -- | -- | 272 | 154 | -- | -- | 272 | 154 |
| Singapore | 14 | 8 | 4,630 | 2,270 | 4,230 | 2,470 | 8,870 | 4,740 |
| South Africa | 6 | 11 | 109 | 67 | 1,590 | 895 | 1,710 | 973 |
| Sweden | -- | -- | 1,850 | 1,690 | 17 | 4 | 1,870 | 1,700 |
| Switzerland | -- | -- | -- | -- | 13,600 | 10,100 | 13,600 | 10,100 |
| Taiwan | 123 | 77 | 10 | 13 | -- | -- | 133 | 90 |
| Thailand | -- | -- | 130 | 125 | -- | -- | 130 | 125 |
| United Arab Emirates | -- | -- | 28 | 17 | 2,220 | 1,220 | 2,250 | 1,230 |
| United Kingdom | -- | -- | 1,070 | 646 | 5,240 | 3,340 | 6,310 | 3,980 |
| Other | 18 | 18 | 348 | 247 | 196 | 121 | 562 | 386 |
| Total | 16,300 | 26,800 | 91,800 | 54,100 | 49,400 | 34,700 | 157,000 | 116,000 |

-- Zero.

¹Table includes data available through April 27, 2020. Data are rounded to no more than three significant digits; may not add to totals shown.

Source: U.S. Census Bureau.

TABLE 5
U.S. EXPORTS OF SILVER, BY COUNTRY OR LOCALITY¹

| Year and country or locality | Other unwrought silver | | | Metal powder | | | Silver nitrate | | | Semimanufactured forms ² | | | Waste and scrap | |
|------------------------------|--------------------------|-------------------|-----------|--------------------------|-------------------|---------|--------------------------|-------------------|------------|-------------------------------------|-------------------|--|--------------------------|-------------------|
| | Gross weight (kilograms) | Value (thousands) | | Gross weight (kilograms) | Value (thousands) | | Gross weight (kilograms) | Value (thousands) | | Gross weight (kilograms) | Value (thousands) | | Gross weight (kilograms) | Value (thousands) |
| 2016 | 233,000 † | \$167,000 † | 771,000 † | \$467,000 † | 43,600 | \$4,040 | 722,000 † | \$427,000 † | 13,400,000 | \$1,480,000 † | | | | |
| 2017: | | | | | | | | | | | | | | |
| Australia | 88 | 36 | 22 | 17 | 608 | 97 | 4,310 | 2,230 | 34 | 83 | | | | |
| Austria | 9 | 34 | 154 | 98 | 139 | 29 | 2,650 | 1,470 | -- | -- | | | | |
| Belgium | -- | -- | 5,090 | 3,260 | -- | -- | 24 | 12 | 919,000 | 42,300 | | | | |
| Brazil | -- | -- | 1,790 | 1,800 | 13 | 3 | 764 | 443 | 890 | 37 | | | | |
| Canada | 53,900 | 28,300 | 12,600 | 11,000 | 30,200 | 1,220 | 121,000 | 69,300 | 1,820,000 | 224,000 | | | | |
| China | 665 | 434 | 81,800 | 51,700 | 128 | 35 | 13,300 | 8,340 | 2,050 | 1,610 | | | | |
| Colombia | 58 | 68 | 10 | 12 | -- | -- | 454 | 234 | 24 | 14 | | | | |
| Costa Rica | 1,970 | 1,040 | 134 | 94 | 824 | 164 | 2,000 | 1,160 | 449 | 6 | | | | |
| Dominican Republic | 519 | 332 | 124 | 82 | 96 | 36 | 995 | 647 | 8 | 4 | | | | |
| France | 181 | 142 | 58,900 | 36,800 | 335 | 9 | 6,080 | 3,340 | 4 | 20 | | | | |
| Germany | 1,950 | 1,260 | 27,900 | 18,200 | 666 | 243 | 10,900 | 6,520 | 2,850,000 | 575,000 | | | | |
| Hong Kong | 6,680 | 3,800 | 13,300 | 8,630 | -- | -- | 2,660 | 2,820 | 2,740 | 2,450 | | | | |
| India | 38,800 | 18,400 | 1,580 | 1,020 | 60 | 28 | 8,560 | 5,230 | 18 | 434 | | | | |
| Ireland | 17 | 5 | 60 | 46 | -- | -- | 24,800 | 13,500 | -- | -- | | | | |
| Israel | 212 | 50 | 57 | 35 | -- | -- | 1,070 | 760 | 6 | 30 | | | | |
| Italy | 2 | 5 | 57,100 | 31,000 | -- | -- | 1,510 | 874 | 1,830,000 | 459,000 | | | | |
| Japan | 20 | 34 | 54,100 | 37,800 | -- | -- | 141,000 | 80,900 | 2,580,000 | 135,000 | | | | |
| Korea, Republic of | 170 | 110 | 51,400 | 32,300 | 73 | 16 | 26,100 | 16,800 | 84,600 | 16,300 | | | | |
| Malaysia | 29 | 8 | 1,300 | 1,070 | 164 | 82 | 5,250 | 2,860 | 573 | 162 | | | | |
| Mexico | 4,820 | 3,340 | 10,700 | 9,590 | 7,240 | 1,780 | 71,100 | 38,200 | 187,000 | 31,000 | | | | |
| Netherlands | -- | -- | 16,400 | 10,200 | -- | -- | 66 | 39 | 51 | 253 | | | | |
| Philippines | 49 | 27 | -- | -- | 74 | 38 | 3,690 | 3,230 | 1 | 10 | | | | |
| Poland | -- | -- | -- | -- | -- | -- | 1,060 | 571 | 122 | 12 | | | | |
| Singapore | 235 | 142 | 318,000 | 189,000 | 2,620 | 1,000 | 4,670 | 2,870 | 140 | 24 | | | | |
| Spain | -- | -- | 186 | 132 | -- | -- | 8,240 | 4,230 | -- | -- | | | | |
| Sweden | -- | -- | -- | -- | 185 | 38 | 5,070 | 2,350 | 2,270,000 | 56,400 | | | | |
| Switzerland | 648 | 805 | 15 | 13 | -- | -- | 3,400 | 2,160 | 496 | 10,500 | | | | |
| Taiwan | 70 | 44 | 127,000 | 78,700 | -- | -- | 1,100 | 686 | 168 | 52 | | | | |
| Thailand | 4,840 | 1,940 | 1,560 | 972 | -- | -- | 4,730 | 2,690 | 16 | 84 | | | | |
| United Arab Emirates | 455 | 108 | -- | -- | -- | -- | 2,640 | 1,310 | -- | -- | | | | |
| United Kingdom | 118 | 52 | 29,400 | 22,400 | 426 | 16 | 18,600 | 10,500 | 448,000 | 249,000 | | | | |
| Other | 3,280 | 1,500 | 616 | 431 | 7,060 | 333 | 10,600 | 5,680 | 5,290 | 3,080 | | | | |
| Total | 120,000 | 62,000 | 872,000 | 546,000 | 50,900 | 5,170 | 508,000 | 292,000 | 13,000,000 | 1,810,000 | | | | |

¹Revised. --Zero.

²Table includes data available through April 27, 2020. Data are rounded to no more than three significant digits; may not add to totals shown.

³Containing 99.5% or more by weight of silver.

Source: U.S. Census Bureau.

TABLE 6
U.S. IMPORTS FOR CONSUMPTION OF REFINED SILVER, BY COUNTRY OR LOCALITY¹

| Year and country or locality | Ores and concentrates, ash, and residues | | Bullion | | Dore | | Total | |
|------------------------------|---|----------------------|----------------------------------|----------------------|----------------------------------|----------------------|----------------------------------|----------------------|
| | Silver content (kilograms) | Value (thousands) | Silver content (kilograms) | Value (thousands) | Silver content (kilograms) | Value (thousands) | Silver content (kilograms) | Value (thousands) |
| 2016 | 4,790 ^r | \$1,520 ^r | 4,870,000 | \$2,680,000 | 1,290,000 | \$1,090,000 | 6,160,000 | \$3,770,000 |
| 2017: | | | | | | | | |
| Argentina | -- | -- | 13,500 | 14,700 | 77,900 | 88,800 | 91,400 | 104,000 |
| Australia | -- | -- | 18,800 | 9,680 | -- | -- | 18,800 | 9,680 |
| Belgium | -- | -- | 111,000 | 54,300 | -- | -- | 111,000 | 54,300 |
| Bolivia | -- | -- | 23,000 | 12,600 | 72,100 | 40,100 | 95,000 | 52,700 |
| Brazil | 10 | 236 | 534 | 266 | -- | -- | 544 | 502 |
| Canada | 5,940 | 1,960 | 1,170,000 | 638,000 | 5,540 | 3,020 | 1,180,000 | 643,000 |
| Chile | -- | -- | 204,000 | 111,000 | -- | -- | 204,000 | 111,000 |
| China | -- | -- | 54,800 | 29,100 | 18,000 | 10,200 | 72,800 | 39,200 |
| Colombia | -- | -- | -- | -- | 1,590 | 789 | 1,590 | 789 |
| Curacao | -- | -- | -- | -- | 1,130 | 645 | 1,130 | 645 |
| Dominican Republic | -- | -- | -- | -- | 1,020 | 589 | 1,020 | 589 |
| Ecuador | -- | -- | -- | -- | 665 | 358 | 665 | 358 |
| Germany | -- | -- | 39,700 | 17,400 | 3,550 | 2,060 | 43,200 | 19,500 |
| Guatemala | -- | -- | -- | -- | 30,700 | 33,800 | 30,700 | 33,800 |
| Italy | -- | -- | 28,700 | 17,700 | 2,220 | 1,310 | 30,900 | 19,000 |
| Kazakhstan | -- | -- | 14,600 | 7,870 | -- | -- | 14,600 | 7,870 |
| Korea, Republic of | -- | -- | 126,000 | 71,400 | -- | -- | 126,000 | 71,400 |
| Mexico | 803 | 171 | 1,780,000 | 973,000 | 691,000 | 619,000 | 2,480,000 | 1,590,000 |
| Panama | -- | -- | 331 | 168 | 165 | 144 | 496 | 312 |
| Peru | -- | -- | 136,000 | 74,300 | 177,000 | 155,000 | 313,000 | 230,000 |
| Poland | -- | -- | 175,000 | 97,300 | -- | -- | 175,000 | 97,300 |
| Russia | -- | -- | 4,910 | 2,730 | -- | -- | 4,910 | 2,730 |
| Switzerland | -- | -- | 45 | 25 | 1,350 | 938 | 1,390 | 963 |
| United Kingdom | -- | -- | 54,600 | 28,500 | 774 | 520 | 55,400 | 29,000 |
| Other | 90 | 3 | 113 | 66 | 192 | 249 | 395 | 318 |
| Total | 6,840 | 2,370 | 3,950,000 | 2,160,000 | 1,080,000 | 958,000 | 5,050,000 | 3,120,000 |

^rRevised. -- Zero.

¹Table includes data available through April 27, 2020. Data are rounded to no more than three significant digits; may not add to totals shown.

Source: U.S. Census Bureau.

TABLE 7
U.S. IMPORTS FOR CONSUMPTION OF SILVER, BY COUNTRY OR LOCALITY¹

| Year and country or locality | Other unwrought silver | | Metal powder | | Silver nitrate | | Semimanufactured forms ² | | Waste and scrap | |
|------------------------------|--------------------------|-------------------|--------------------------|-------------------|--------------------------|-------------------|-------------------------------------|-------------------|--------------------------|-------------------|
| | Gross weight (kilograms) | Value (thousands) | Gross weight (kilograms) | Value (thousands) | Gross weight (kilograms) | Value (thousands) | Gross weight (kilograms) | Value (thousands) | Gross weight (kilograms) | Value (thousands) |
| 2016 | 343,000 | \$164,000 | 358,000 [†] | \$52,500 | 3,390 | \$731 | 692,000 | \$357,000 | 6,640,000 [†] | \$260,000 |
| 2017: | | | | | | | | | | |
| Belgium | -- | -- | -- | -- | 1 | 43 | -- | -- | 332,000 | 1,870 |
| Bolivia | -- | -- | 37,100 | 19,800 | -- | -- | -- | -- | 221 | 171 |
| Brazil | -- | -- | -- | -- | (3) | 38 | -- | -- | 760,000 | 5,140 |
| Canada | 91,500 | 23,400 | 21,800 | 978 | (3) | 141 | 104,000 | 57,500 | 578,000 | 70,100 |
| Chile | -- | -- | -- | -- | -- | -- | 114,000 | 62,900 | 15,100 | 3,390 |
| China | 69 | 72 | 42,800 | 1,850 | (3) | 5 | 18 | 11 | 301,000 | 12,800 |
| France | -- | -- | 20,000 | 2,110 | -- | -- | -- | -- | 38,000 | 157 |
| Germany | 2,290 | 1,520 | 15,000 | 9,020 | 2 | 129 | 2,510 | 1,440 | 1,750,000 | 211,000 |
| Honduras | -- | -- | -- | -- | -- | -- | -- | -- | 28,100 | 433 |
| Hong Kong | -- | -- | -- | -- | -- | -- | -- | -- | 62,300 | 136 |
| Hungary | -- | -- | 55,500 | 3,040 | -- | -- | -- | -- | -- | -- |
| India | 199 | 65 | 24 | 15 | (3) | 6 | 400 | 112 | 3,350 | 184 |
| Ireland | -- | -- | -- | -- | -- | -- | -- | -- | 86,700 | 291 |
| Israel | 6 | 5 | -- | -- | -- | -- | 11 | 10 | 5,910 | 1,260 |
| Italy | 2,400 | 1,280 | 9 | 3 | -- | -- | 74 | 148 | 16 | 59 |
| Japan | 69 | 78 | 233,000 | 20,900 | -- | -- | 16 | 26 | 3,310 | 432 |
| Korea, Republic of | 85 | 15 | 129 | 47 | (3) | 7 | 128,000 | 71,100 | 2,900 | 555 |
| Malaysia | -- | -- | 10 | 7 | -- | -- | -- | -- | 533,000 | 2,800 |
| Mexico | 262,000 | 142,000 | 179 | 106 | -- | -- | 85,500 | 42,100 | 251,000 | 14,400 |
| Netherlands | 7,460 | 249 | -- | -- | (3) | 19 | 23 | 13 | 11,100 | 124 |
| Peru | 24,900 | 13,500 | -- | -- | -- | -- | -- | -- | 3,450 | 114 |
| Poland | -- | -- | 9 | 7 | (3) | 4 | 25,200 | 10,100 | -- | -- |
| Singapore | -- | -- | 39 | 37 | -- | -- | 212 | 125 | 42,900 | 782 |
| Slovakia | -- | -- | -- | -- | -- | -- | -- | -- | 91,600 | 446 |
| South Africa | -- | -- | -- | -- | -- | -- | -- | -- | 10,900 | 2,810 |
| Spain | -- | -- | 41 | 35 | -- | -- | 95 | 69 | 1,850 | 35,700 |
| Sweden | -- | -- | 445 | 179 | -- | -- | -- | -- | 101,000 | 848 |
| Switzerland | -- | -- | 953 | 565 | (3) | 19 | 4 | 5 | -- | -- |
| United Kingdom | 42 | 30 | 1,620 | 965 | (3) | 158 | 1,110 | 503 | 20,400 | 680 |
| Vietnam | -- | -- | -- | -- | -- | -- | -- | -- | 214,000 | 4,250 |
| Other | 562 | 274 | 882 | 321 | 3 | 80 | 1,820 | 1,100 | 143,000 | 15,700 |
| Total | 392,000 | 182,000 | 430,000 | 60,000 | 6 | 649 | 462,000 | 247,000 | 5,390,000 | 387,000 |

[†]Revised. -- Zero.

¹Table includes data available through April 27, 2020. Data are rounded to no more than three significant digits; may not add to totals shown.

²Containing 99.5% or more by weight of silver.

³Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 8
SILVER: WORLD MINE PRODUCTION, BY COUNTRY OR LOCALITY¹

(Kilograms)

| Country or locality | 2013 | 2014 | 2015 | 2016 | 2017 |
|---------------------------|------------------------|--------------------------|------------------------|------------------------|------------------------|
| Algeria | 27 | 16 | 15 ^e | 10 ^e | 10 ^e |
| Argentina | 890,152 ^r | 989,950 ^r | 1,175,760 | 1,055,700 ^r | 1,016,215 |
| Armenia | 19,458 | 19,333 | 14,346 | 3,210 ^r | 15,600 ^e |
| Australia | 1,735,000 ^r | 1,888,000 ^r | 1,506,000 ^r | 1,434,000 ^r | 1,200,000 ^e |
| Azerbaijan | 630 | 239 | 133 | 320 ^r | 705 |
| Bolivia | 1,287,200 | 1,398,163 ^r | 1,306,098 ^r | 1,353,202 ^r | 1,243,000 |
| Botswana | 22,597 | 22,328 | 2,801 | -- ^r | -- |
| Brazil | 38,200 | 36,700 | 37,000 | 32,000 ^{r,e} | 30,000 ^e |
| Bulgaria | 55,637 | 50,200 | 37,955 ^r | 52,526 ^r | 57,000 ^e |
| Burkina Faso | 14,541 | 14,000 ^{r,e} | 12,441 | 21,772 | 21,800 |
| Canada ² | 640,362 ^r | 495,403 ^r | 383,807 ^r | 404,666 ^r | 395,000 |
| Chile | 1,174,000 | 1,572,000 | 1,504,000 | 1,497,037 | 1,260,000 |
| China | 3,673,320 | 3,567,572 ^r | 3,393,392 | 3,496,000 | 3,502,000 |
| Colombia | 13,968 | 11,498 | 10,155 | 10,427 ^r | 15,500 |
| Congo (Kinshasa) | 60,431 | 6,492 | 2,412 | 835 ^e | 500 ^e |
| Côte d'Ivoire | 572 | 586 ^r | 587 ^r | 594 | 485 |
| Cyprus | -- | -- | -- | -- | 96 |
| Dominican Republic | 80,439 | 135,108 | 99,800 | 121,749 ^r | 147,047 |
| Ecuador | 1,198 ^r | 577 ^r | 1,494 ^r | 934 ^r | 1,000 ^e |
| Eritrea | 15,799 ^r | 52,668 ^r | 70,330 | 13,200 ^r | 49,921 |
| Ethiopia | 900 ^{r,e} | 1,020 ^r | 1,000 ^{r,e} | 1,000 ^r | 1,000 ^e |
| Fiji ³ | 462 | 361 ^r | 354 ^r | 354 ^{r,e} | 350 |
| Finland | 12,000 ^{r,e} | 14,500 ^{r,e} | 13,051 ^r | 16,300 ^{r,e} | 13,700 ^e |
| Georgia | 1,100 ^e | 700 ^e | 800 ^e | 900 ^r | 500 ^e |
| Ghana ^e | 3,300 | 3,400 | 3,200 ^r | 2,300 ^r | 1,800 |
| Greece | 39,028 ^r | 35,785 ^r | 25,170 ^r | 29,409 ^r | 24,191 |
| Guatemala | 283,000 ^e | 631,382 ^r | 862,197 ^r | 793,083 ^r | 572,714 |
| Honduras | 50,917 | 56,827 | 34,369 ^r | 19,275 ^r | 21,400 ^e |
| India | 367,022 ^r | 338,084 ^r | 383,479 ^r | 445,367 | 526,000 |
| Indonesia | 123,109 | 119,189 | 151,934 | 185,234 ^r | 99,600 |
| Iran ^e | 85,000 ^r | 80,000 ^r | 90,000 ^r | 90,000 ^r | 90,000 |
| Ireland | 7,822 | 6,436 ^r | 3,770 ^r | 1,080 ^r | 1,340 |
| Japan | 3,644 | 3,541 | 4,616 | 5,076 | 3,424 |
| Kazakhstan | 584,435 ^r | 474,991 ^r | 370,404 ^r | 413,821 ^r | 441,056 |
| Korea, North ^e | 50,000 | 50,000 | 50,300 | 50,400 | 50,000 |
| Korea, Republic of | 2,925 ^r | 3,289 | 4,586 ^r | 6,579 ^r | 6,700 |
| Kyrgyzstan | 9,331 | 9,331 | 9,890 ^r | 18,410 ^r | 19,320 |
| Laos | 32,262 ^r | 39,806 ^r | 51,763 ^r | 50,904 ^r | 49,900 |
| Malaysia | 361 ^r | 533 ^r | 945 ^r | 1,075 ^r | 1,404 |
| Mexico | 5,820,991 | 5,765,662 | 5,591,510 ^r | 5,408,521 ^r | 6,108,722 |
| Mongolia | 38,000 ^{r,e} | 51,451 ^r | 60,000 ^{r,e} | 69,000 ^{r,e} | 160,000 ^e |
| Morocco | 194,080 | 185,770 | 207,740 ^r | 316,000 ^r | 850,000 ^e |
| Namibia ⁴ | 1,400 | 1,129 ^{r,5} | 11,555 ^{r,6} | 4,702 ^{r,7} | 4,000 ^e |
| New Zealand | 11,223 | 15,811 ^r | 12,498 ^r | 7,960 ^r | 7,919 |
| Nicaragua | 13,743 ^r | 13,889 ^r | 18,577 ^r | 21,382 ^r | 19,000 |
| Niger | 50 ^{r,e} | 67 ^r | 119 ^r | 120 ^{r,e} | 120 ^e |
| Pakistan | 1,988 ^r | 1,609 ^r | 9,693 ^r | 3,110 | 3,000 ^e |
| Papua New Guinea | 82,702 ^r | 91,843 ^r | 77,666 ^r | 90,498 ^r | 90,000 |
| Peru | 3,674,283 | 3,768,147 ^r | 4,101,568 ^r | 4,375,337 ^r | 4,303,541 |
| Philippines | 40,043 | 23,005 | 29,952 ^r | 35,186 ^r | 32,351 |
| Poland | 1,393,000 ^r | 1,384,000 ^r | 1,407,000 ^r | 1,482,000 ^r | 1,290,000 ^e |
| Portugal | 37,025 ^r | 39,350 ^r | 37,677 ^r | 35,211 ^r | 36,713 |
| Russia | 2,175,600 ^r | 2,360,000 ^{r,e} | 2,297,000 ^r | 2,200,000 ^r | 2,030,000 |
| Slovakia | 508 | 437 | 440 | 500 ^{r,e} | 500 ^e |
| Solomon Islands | 413 | 280 | -- | -- | -- |
| South Africa | 68,777 ^r | 49,220 ^r | 51,861 ^r | 52,127 | 56,000 ^e |

See footnotes at end of table.

TABLE 8—Continued
SILVER: WORLD MINE PRODUCTION, BY COUNTRY OR LOCALITY¹

(Kilograms)

| Country or locality | 2013 | 2014 | 2015 | 2016 | 2017 |
|---------------------|-------------------------|-------------------------|-------------------------|-------------------------|---------------------|
| Spain | 27,979 | 27,306 | 27,287 | 26,099 | 30,596 |
| Sweden | 341,346 | 382,611 | 479,700 ^r | 498,686 ^r | 467,500 |
| Tajikistan | 1,800 | 3,000 ^e | 4,000 ^e | 3,000 ^r | 3,000 ^e |
| Tanzania | 12,159 | 15,569 ^r | 15,569 ^r | 17,984 ^r | 25,914 |
| Thailand | 32,381 ^r | 31,046 ^r | 21,047 ^r | 35,954 ^r | 35,000 ^e |
| Turkey | 189,600 | 183,880 | 190,550 ^r | 376,640 ^r | 249,484 |
| United Kingdom | 82 | -- ^e | -- | -- | -- |
| United States | 1,050,000 | 1,180,000 | 1,090,000 | 1,150,000 | 1,030,000 |
| Uzbekistan | 61,000 ^e | 54,000 | 47,000 | 22,024 ^r | 21,864 |
| Zambia | 16,000 | 15,000 | 15,000 | 15,000 | 15,000 |
| Zimbabwe | 1,150 ^r | 1,297 ^r | 1,212 ^r | 1,463 ^r | 1,480 |
| Total | 26,700,000 ^r | 27,800,000 ^r | 27,400,000 ^r | 27,900,000 ^r | 27,800,000 |

^eEstimated. ^rRevised. -- Zero.

¹Table includes data available through August 6, 2018. All data are reported unless otherwise noted. Totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

²Metal content of concentrate produced.

³Mine output, silver content.

⁴Metal content of concentrates, estimated.

⁵From copper concentrate.

⁶From gold bullion.

⁷From zinc concentrates.