



2017 Minerals Yearbook

GOLD [ADVANCE RELEASE]

GOLD

By Micheal W. George

Domestic survey data and tables were prepared by Kristi J. Simmons, statistical assistant.

In 2017, domestic mine production of gold increased by 3.7% to about 237,000 kilograms (kg) from 228,000 kg in 2016 (tables 1, 2). In 2017, the value of domestic production increased by nearly 4.5% to \$9.60 billion, owing to a slight increase in the average price of gold for the year and the increase in domestic gold production. Nevada and Alaska, the two leading producing States, accounted for 73% and 11%, respectively, of domestic gold production in 2017 (table 2). The remaining production, in descending order of quantity, came from mines in Colorado, California, Utah, South Carolina, South Dakota, Washington, Montana, New Mexico, Arizona, Michigan, and Idaho. Gold was recovered at lode mines in all the gold-producing States, at two large placer mines in Alaska, and at numerous small placer mines, mostly in Alaska. In addition, about 5% of domestic mined gold was recovered as a byproduct of the recovery of base metals, primarily copper, and other precious metals, primarily silver. The leading gold-producing operations, listed in table 3, accounted for more than 99% of domestic gold production.

According to S&P Global Market Intelligence (2017, p. 1–4), gold was the leading nonfuel mineral exploration target worldwide in 2017; overall, the global exploration budget for gold increased by 22% from that in 2016 to \$4 billion and accounted for about 51% of the budgeted nonfuel mineral exploration expenditures of about \$8 billion. Gold exploration in Australia, Canada, and the United States accounted for 41% (\$1.67 billion) of the budgeted 2017 global gold exploration expenditure. Canada overtook Australia as the leading single country target for gold exploration. Latin America was the leading region for gold exploration with 26% of the total gold exploration budget; Mexico accounted for the largest expenditures, followed by Brazil, Chile, Peru, and Colombia.

Total world mine production of gold in 2017 was about 3,230,000 kg, slightly more than production in 2016 (table 8). In 2017, the top five gold-producing countries, in descending order of production, were China, Australia, Russia, the United States, and Canada; these accounted for 43% of global gold production.

Commercial-grade refined gold was produced by about two dozen domestic companies. Many of these companies produced gold from domestic and imported products (bullion, concentrates, dore, and scrap) and were located mainly in Florida, Massachusetts, New Jersey, New York, Ohio, Rhode Island, and Utah. Among several thousand companies and artisans, a few dozen companies dominated the fabrication of gold into commercial products. Jewelry manufacturing in the United States was heavily concentrated in the New York, NY, and Providence, RI, areas, with other major manufacturers in California, Florida, and Texas. In 2017, the estimated percentages of gold consumed for commercial products (excluding investment products but including official coinage)

were jewelry, 46%; electrical and electronics, 40%; official coins, 9%; dental and medical, 4%; and other uses, 1%.

In March 2017, a Federal prosecutor charged three South Florida traders with money laundering, which involved the purchase of \$3.6 million worth of smuggled gold from narcotics traffickers in Latin America that was refined at Ohio Precious Metal, LLC's Jackson refinery in Ohio. The South Florida traders worked for a subsidiary of Elemetal LLC, the Dallas-based firm that merged with Ohio Precious Metals in 2012. Elemetal lost industry certifications to trade gold, and the refinery was closed in April 2017 (Nehamas, 2018).

As of yearend 2017, global estimated historical gold mine production has totaled about 190,000 metric tons (t) of gold. Because gold has been nearly 100% recycled and is resistant to corrosion and oxidation, about 98% of the gold that has been produced throughout history is still available. As of yearend 2017, about 90,200 t of gold was held privately as jewelry, about 41,300 t was held privately as investments, about 31,900 t was in official bullion holdings worldwide, about 23,300 t was in other fabricated products, and about 3,700 t was unaccounted for (O'Connell and others, 2018, p. 30).

Legislation and Government Programs

Gold mining has been identified as a potential source of funding for armed groups involved in civil unrest in several countries, especially in the Democratic Republic of the Congo [Congo (Kinshasa)] and adjoining countries. The United States, through the enactment of Section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act) on July 21, 2010, made it a statutory obligation for all companies registered with the U.S. Securities and Exchange Commission (SEC) to perform due diligence to determine whether the products they manufacture, or the components of the products they manufacture, contain tantalum, tin, tungsten, or gold (3TG minerals) and, if so, to determine whether these minerals were sourced from Congo (Kinshasa) and (or) its bordering countries. Accordingly, companies were required to file a specialized disclosure form (SD form) with the SEC including their findings as to whether 3TG minerals used in their products and components were sourced from the conflict region (U.S. Government Printing Office, 2010, p. 2213–2220). In 2017, a total of 1,165 companies filed conflict minerals SD forms (1,230 companies filed disclosures in 2016). Of the 2017 filings, 53% of the reporting companies were able to determine the country of origin of their conflict minerals, compared with 49% in 2016. The ability of reporting companies to identify the country of origin of their conflict minerals was hindered when there were multiple tiers of suppliers between the reporting company and the upstream concentrate-processing facility. For those reporting companies that identified the

country of origin of their conflict minerals, a majority could not determine whether or not the conflict minerals financed or benefited armed groups in the covered countries. This was because of uncertainties about source and chain of custody of the conflict minerals processed at the processing facilities. However, some companies have noted improvements in their data collection because of an increased awareness among suppliers about conflict minerals and the process for collecting data on supply chains had become more routine and standardized. Although reporting companies were not required to identify which conflict minerals they used, of those that did, 63% reported using gold in 2017 (U.S. Government Accountability Office, 2018, p. 9–11).

Other countries, groups, and international organizations were developing programs to assist companies in avoiding contributing to regional conflicts; among entities developing programs were the Electronic Industry Citizenship Coalition, the European Parliament, the Government of Canada, the London Bullion Trade Association, the Organisation for Economic Co-operation and Development, the Public Private Alliance on Responsible Mineral Trade, the Responsible Jewellery Council, the United Nations, and the World Gold Council. Some agencies have reported that efforts to document or curtail the supply of conflict minerals have hampered legal formal and artisanal mining while encouraging other criminal mining activities in the region. Once gold is melted down and combined with gold from other sources, it is difficult to track (Webb, 2015).

Production

Domestic lode mine production data for gold were compiled by the U.S. Geological Survey (USGS) from two separate voluntary monthly surveys of U.S. mining operations and from publicly available sources; the surveys represented 99% of this chapter's tabulated domestic gold production. Data on placer gold production in Alaska were provided by the Alaska Division of Geological & Geophysical Surveys and were included in the domestic production figures. However, individual company production data listed in table 3 or cited elsewhere in this chapter were obtained from published sources, such as company annual reports.

Alaska.—In 2017, Alaska produced 26,200 kg of gold (table 2), from both lode and placer operations, valued at \$1.06 billion. This was 5% less by quantity and 4% less by value than output in 2016. Gold was produced at 1 open pit gold mine, 2 underground gold mines, 1 underground silver-zinc mine, and about 240 placer operations. Kinross Gold Corp.'s open pit Fort Knox Mine near Fairbanks was Alaska's leading gold producer and produced 11,900 kg of gold equivalent (which includes other metals converted to gold weight, based on the value of the metal) in 2017, 7% less than that in 2016. Despite a higher average gold ore grade, decreased production at the mine reflected a reduction in the ore tonnage leached because less ore was placed on the leach pad during the year (Kinross Gold Corp., 2018, p. 4, 10).

Coeur Mining, Inc.'s underground Kensington Mine, 74 kilometers (km) northwest of Juneau, produced 3,580 kg of gold, a 7% decrease from that produced in 2016 owing to lower ore grades (Coeur Mining, Inc., 2018, p. 8). The underground

Pogo Mine, 145 km southeast of Fairbanks, produced 8,400 kg of gold in 2017, slightly more than 2016 production (Lasley, 2018).

The remaining lode-gold production in Alaska was as a byproduct from Hecla Mining Co.'s underground Greens Creek silver-zinc mine on Admiralty Island near Juneau, which produced 1,580 kg of gold, 6% less than that in 2016 because of lower recoveries and slightly lower ore grades (Hecla Mining Co., 2018, p. 3).

California.—In 2017, gold was produced at the Mesquite Mine and the Soledad Mountain Mine. New Gold Inc.'s Mesquite Mine, 70 km northwest of Yuma, AZ, produced 5,250 kg of gold, 52% more than that produced in 2016, owing to an increase in ore mined and an increase in the amount of gold-bearing solution flow from the leach pad. The mine production exceeded production guidance for 2017 and 2018, which are 4,400 to 4,700 kg of gold (New Gold Inc., 2018, p. 41–42). Golden Queen Mining Co. Ltd.'s 50%-owned Soledad Mountain Mine, 8 km south of Mojave in Kern County, CA, began production in March 2016, and produced 1,430 kg of gold during its first full year of production in 2017 (Golden Queen Mining Co. Ltd., 2018, p. 27).

Small quantities of gold were also produced in California as a byproduct from industrial mineral operations (such as limestone and sand and gravel operations), from several small underground mines that primarily recovered specimen gold products, and from small artisanal placer workings. This production was not included in the USGS production data.

Colorado.—In 2017, Newmont Mining Corp.'s open pit Cripple Creek Mine, near the town of Victor, produced 14,000 kg, about 14% more than 2016 production owing to an increase in ore placement and recovery at the Valley Leach Fill 2, which opened in January 2016 and reached full production in 2017 (Newmont Mining Corp., 2018a, p. 72; 2018b, p. 1).

Montana.—Gold production at Barrick Gold Corp.'s underground Golden Sunlight Mine, 48 km east of Butte, increased by about 21% in 2017 compared with that in 2016 to 1,280 kg; an increase in ore mined and the recovery rate more than offset a decrease in ore grade (Barrick Gold Corp., 2018a).

Nevada.—In 2017, Nevada produced about 173,000 kg of gold valued at \$7.02 billion, which was slightly more by quantity and value than that produced in 2016, and retained its long-standing position as the Nation's leading gold-producing State.

In 2017, Barrick produced 71,500 kg of gold from mines in north central Nevada, 10% less than in 2016, from its wholly owned Cortez Operations and Goldstrike Mine; its 75% share of the Turquoise Ridge Mine; and its 60% share of the Arturo Mine. The decreased production was due to processing lower ore grades from the Goldstrike open pit mine at the Goldstrike roaster, a decrease in the amount of ore mined from the Goldstrike underground mine, and fewer tons mined and placed on the leach pads at Cortez. Gold production from the Turquoise Ridge Mine decreased by 21% compared with that of 2016 owing to lower gold ore grades. These decreases were partially offset by an increase in the average ore grade from the Cortez Hills open pit mine and an increase in throughput at the oxide mill (Barrick Gold Corp., 2018a; 2018b, p. 50–52, 62).

Newmont's operations in north central Nevada produced 56,900 kg of gold, a 7% increase compared with 2016, from the Carlin Mines Operations and the Long Canyon, Phoenix, Twin Creeks, and the joint-venture Turquoise Ridge (25% share) Mines. Long Canyon started production in November 2016 and produced 5,410 kg of gold in 2017, almost seven times more than 2016 production. The Carlin Mines Operations produced 30,200 kg, 3% more than 2016 production primarily because the higher ore grade at the Leeville Mine more than offset halted mining activity at the Silverstar Mine; the latter's cessation was due to geotechnical issues in the fourth quarter of 2016 and was closed during all of 2017. In 2017, gold produced at the Twin Creeks Mine decreased by 17% owing to lower ore grades, lower mill throughput at the Juniper mill owing to harder ore, and lower ore grades processed at the Sage mill. The Phoenix project operations produced 14% more gold in 2017 than in 2016 owing to higher mill grades and an increase in ore placement on the leach pads from the Brooks pit at Lone Tree (Newmont Mining Corp., 2018a, p. 61–62; 2018b, p. 1).

In 2017, Kinross's Round Mountain produced 13,600 kg of gold equivalent, about 16% more than 2016 production mainly owing to an increase in mill grades. Production at the Bald Mountain Mine was 8,790 kg of gold equivalent, which was more than double that in 2016 owing to higher ore grades and an increase in the amount of ore placed on the leach pads (Kinross Gold Corp., 2018, p. 5, 10).

In 2017, Klondex Mines Ltd. produced 4,670 kg, 14% more than that produced in 2015 owing to the increased amount of ore processed and higher mill grades. Klondex owned and operated the Aurora, Fire Creek, Hollister, and Midas Mines. In 2017, Fire Creek and Midas Mines produced 3,330 kg and 1,070 kg of gold, respectively. The Aurora and Hollister Mines, which were purchased from Carlin Resources, LLC, a subsidiary of Waterton Precious Metals Fund II Cayman, LP, were restarted in the third quarter of 2017 (Klondex Mines Ltd., 2016; 2017, p. 23; 2018, p. 9–10). Gold production at Coeur's Rochester silver mine was about 1,590 kg in 2017, a slight increase from production in 2016 (Coeur Mining, Inc., 2018, p. 6).

Other mines in Nevada recorded decreased gold production in 2017. Scorpio Gold Corp.'s 70%-owned Mineral Ridge operations produced 592 kg of gold, 48% less than production in 2016 owing to a 47% decrease in the amount of ore mined and the temporary suspension of mining in early November 2017 (Scorpio Gold Corp., 2018). SSR Mining Inc., formerly Silver Standard Resources Inc., operated the Marigold Mine in Humboldt County. The mine produced 6,290 kg of gold in concentrates, slightly less than that produced in 2016 because of a decrease in ore production (SSR Mining Inc., 2018, p. 11).

South Carolina.—On January 20, 2017, OceanaGold Corp. announced the start of gold production at its Haile Gold Mine in South Carolina and produced 3,690 kg of gold during the year (OceanaGold Corp., 2017; 2018, p. 5). Haile was the first active gold mining operation east of the Mississippi River since Kennecott Minerals Co. closed the Ridgeway Mine in South Carolina in 1999.

South Dakota.—Coeur Mining's Wharf Mine near Lead produced about 2,970 kg of gold in 2017, 13% less than 2016

production. Lower ore grades and recovery more than offset an increase in ore mined (Coeur Mining, Inc., 2018, p. 7).

Utah.—Rio Tinto Kennecott Corp.'s Bingham Canyon Mine near Salt Lake City produced 5,530 kg of gold as a byproduct from copper and molybdenum mining. Gold production was 16% more than that of 2016 owing to increases in ore grade and amount of ore processed (Rio Tinto plc, 2018, p. 24).

Washington.—Kinross's underground Kettle River-Buckhorn Mine in the north-central part of the State produced about 2,380 kg of gold equivalent, 32% less than that produced in 2016 because mine activities were completed in the third quarter of 2017. Ore was shipped to the Kettle River mill adjacent to the closed Kettle River Mine, which was about 76 km from the Kettle River-Buckhorn Mine. The company continued exploration in the area (Kinross Gold Corp., 2018, p. 5, 10).

Consumption

Thomson Reuters Gold Fields Mineral Services Ltd. (GFMS) reported that total global fabrication (excluding retail investment) in 2017, including scrap, consumed 2,590 t of gold, almost 10% more than revised consumption in 2016; this was the first increase since 2013. The major reason for the higher 2017 consumption was a 13% increase in jewelry fabrication to 2,210 t. Jewelry manufacturers in India were reported to have increased their stocks of gold during the year before the introduction of an Indian Good & Services Tax, which would be implemented in early 2018. In 2017, the six leading jewelry-manufacturing countries, in descending order by gold consumed for jewelry, were India (718 t), China (674 t), Turkey (83 t), Italy (80 t), the United States (67 t), and the United Arab Emirates (53 t), and these accounted for almost 76% of the world's gold jewelry fabrication. In 2017, seven countries had significant (more than 3-t) increases in gold consumption for jewelry—India (up by 264 t), United Arab Emirates (11.4 t), Turkey (5.6 t), Sri Lanka (4.1 t), Russia (3.5 t), Pakistan (3.3 t), and Iran (3.2 t). Only four countries had significant (more than 3-t) decreases in gold used in jewelry fabrication owing to currency weaknesses that affected demand—China (down by 17.5 t), Saudi Arabia (5.1 t), Egypt (3.9 t), and Malaysia (3.6 t) (O'Connell and others, 2018, p. 37–43).

In 2017, global consumption of gold for industrial uses increased by 4%, the first increase since 2010 owing to a stronger global economic environment and an increase in consumption by the electronics industry, mainly by semiconductor manufacturers. Globally, gold consumption for electronics (277 t) and other industrial and decorative applications (73.2 t) increased by 5% and 3%, respectively. Gold used in dental and medical applications was 29.4 t, a decrease of 3% (O'Connell and others, 2018, p. 45–47).

According to GFMS, the 2017 domestic gold consumption used in fabrication (excluding retail investment) was 111 t, a 6% decrease compared with 2016 consumption. Much of the consumption was used in the fabrication of jewelry, which increased slightly to 67 t in 2017. Gold contained in jewelry that was purchased in the United States was 145 t, a 6% increase compared with 136 t in 2016. Consumption of gold

for industrial uses increased by 13% to 44 t, mainly from the increase in domestic production of electronics and a minor increase in dental uses (O'Connell and others, 2018, p. 37–42, 45–47, 63–64).

Prices and Investment

The Engelhard daily price began the year at \$1,152.10 per troy ounce, the lowest level for the year. The price was volatile during most of 2017 but increased to the yearly high of \$1,351.44 per troy ounce on September 8 before it trended downward and ended the year at \$1,302.86 per troy ounce. Gold prices traded in a narrower range as compared with 2016. The annual average daily price for 2017 of \$1,260.90 per troy ounce was \$8.73 per troy ounce higher than the average annual price in 2016, the smallest change since 2001.

The components of gold investments are the retail investments—gold bars, official coins, medals, and imitation coins—and the change in physical gold held by gold exchange-traded funds (ETFs). Global net gold investment in 2017 decreased to 1,210 t, a 23.8% decline compared with the record high in 2016, as a result of less investment in gold ETFs. The ETFs purchased a net of 177 t of gold in 2017, a 67.1% decrease compared with the net purchases of 539 t in 2016. The bulk of the global net retail investment was purchases of gold bars totaling 780 t, slightly less than 2016 purchases. In 2017, global purchases of official coins, medals, and imitation coins decreased by 3.5% to 248 t (O'Connell and others, 2018, p. 17–21). In 2017, the U.S. Mint sold 9,409 kg of American Eagle gold bullion coins and 3,095 kg of American Buffalo gold bullion coins, decreases of 69% and 55%, respectively, from quantities sold in 2016; the 2017 sales were the lowest levels since 2007 (U.S. Mint, 2018).

According to GFMS estimates, the official sector (Governments and national banks) purchased a net 366 t of gold in 2017, which was 36% more than 2016 net purchases. It was the eighth consecutive year of net purchases. Some of the leading buyers in 2017 were Russia (224 t), Turkey (86 t), Kazakhstan (43 t), and Colombia (4.6 t). Germany and Venezuela were the major net sellers with sales of 4 t and 25 t, respectively (O'Connell and others, 2018, p. 34–35).

Foreign Trade

The United States was a net exporter (exports minus imports) of nearly 207 t of gold contained in bullion, dore, and ores and concentrates (tables 4, 6). Based on unrounded data, refined bullion constituted 61% of exports (table 4) and 39% of U.S. total gold imports (table 6).

In 2017, exports of refined bullion were 281,000 kg, 17% more than 2016 exports. The United Kingdom (41%), Hong Kong (35%), Switzerland (11%), and China and India (5% each) were the principal destinations for refined bullion exports from the United States in 2017 (table 4). Imports of refined bullion were 99,900 kg, 77% less than 2016 imports. Canada (43%), Peru (20%), Brazil (11%), and Mexico (7%) were the leading sources of refined bullion imported into the United States in 2017 (table 6).

Dore exports in 2017 were 176,000 kg, a 17% increase compared with that of 2016. The primary destinations were

Switzerland (67%), India (22%), and the United Arab Emirates (8%) (table 4). In 2017, imports of dore were 154,000 kg, 27% less than imports in 2016. Mexico (42%), Peru (15%), Colombia (14%), and Canada (11%) were the principal sources of dore in 2017 (table 6).

World Review

According to the GFMS annual review of world gold supply and demand, total global supply of gold in 2017 was 4,420 t, about 3.8% less than in 2016. The supply decrease included a 4-t decrease in global primary production and a 73-t net increase in producer stocks. Gold recovery from old scrap decreased for the first time since 2013 and decreased by 7.4% to 1,210 t. Because the gold price did not increase by a significant amount compared with previous years, scrap sellers were less motivated to sell. China, the leading scrap-producing country, produced 223 t of gold contained in scrap, which was a decrease of 4.2% compared with 2016 production. Much of the decrease was from the Indian subcontinent but East Asia, the Middle East, and North America also contributed to the reduction in gold recovered from old scrap (O'Connell and others, 2018, p. 7, 30–32). In 2017, U.S. recovery of gold from old and new scrap was 96,300 kg, 21.9% less than that in 2016 (table 1).

In 2017, world mine output of gold from the almost 100 countries having reported or production was about 3,230 t, slightly more than that in 2016 (table 8). This was the ninth consecutive year of increase.

The 12 leading gold-producing countries, in decreasing order of production, were China, Australia, Russia, the United States, Canada, Peru, South Africa, Ghana, Mexico, Sudan, Uzbekistan, and Kazakhstan; these accounted for about 69% of global production. The next 12 leading gold-producing countries accounted for about 20% of global gold production. Gold production increased by more than 8 t in eight countries—Russia (up by 16,637 kg), Sudan (14,000 kg), Australia (13,700 kg), Bolivia (12,078 kg), Kazakhstan (10,292 kg), Kyrgyzstan (8,900 kg), the United States (8,520 kg), and Burkina Faso (8,100 kg). Major decreases were recorded in China (down by 27,358 kg), Chile (10,401 kg), and Colombia (9,600 kg).

Argentina.—In 2017, gold production was estimated to be 63,000 kg, 11% more than 2016 production. About one-half of the increase was because of production increases at Goldcorp Inc.'s Cerro Negro Mine, which produced 14,100 kg of gold, up by 25%. The increase was due to the increased amount of ore mined (Goldcorp Inc., 2018, p. 33–34).

Australia.—In 2017, gold production in Australia was 301,000 kg, up by 5%. Some of the increase was from Kirkland Lake Gold Ltd.'s Fosterville Mine. Kirkland acquired the mine in November 2016. The mine produced 8,210 kg of gold in 2017, about 3,500 kg or 74% more than the amount produced in 2016 (Kirkland Lake Gold Ltd., 2018, p. 25; O'Connell and others, 2018, p. 23). A production increase was also reported by the Tropicana Mine, a joint venture between AngloGold Ashanti Ltd. (70%) and Independence Group NL (30%), which produced 14,300 kg of gold, 10% more than 2016 production owing to an increase in mill throughput (AngloGold Ashanti Ltd., 2018,

p. 105, 121). Northern Star Resources Ltd. produced a combined 17,000 kg of gold from three operations in Australia, 15% more than 2016 production. Much of the increase was from the Jundee Mine; gold production was 8,470 kg in 2017, 42% more than production in 2016, because of increased tonnage mined and higher gold ore grades (Northern Star Resources Ltd., 2017, p. 4–5; 2018, p. 4–5).

Production declines were reported by several mines. Newmont's Kalgoorlie Mine produced 11,400 kg of gold, 4% less than 2016 production owing to lower mill throughput and ore grades. Newmont's other mines (Boddington and Tanami) produced a total of 37,500 kg of gold in 2017, compared with 39,200 kg in 2016; lower ore grades more than offset higher mill throughput (Newmont Mining Corp., 2018a, p. 64; 2018b). Newcrest Mining Ltd.'s Cadia Mine produced 17,000 kg of gold, 28% less than that in 2016. A large seismic event in April resulted in limited production at the mine for the rest of the year. Newcrest's Telfer open pit mine produced 11,900 kg of gold, 13% less than 2016 production because of record levels of rain in the first quarter 2017 (Newcrest Mining Ltd., 2017, p. 2–5; 2018, p. 2–5).

Azerbaijan.—In 2017, gold production more than tripled. Much of the country's production took place in the Gedabek and Gosha fields in the western regions under a production sharing agreement with Anglo Asian Mining (AAM) plc (49%), with the Government owning 51% (Russia & CIS Metals and Mining Weekly, 2018a).

Burkina Faso.—Gold mine production was 46,200 kg, 21% more than 2016 production. Several new mines began production in 2016 and continued to ramp up to their full production rate in 2017. The new operations included Endeavour Mining Corp.'s Hounde and Karma Mines, Nordgold SE's Bouly Mine, and Roxgold Inc.'s Yaramoko Mine (Endeavour Mining Corp., 2018, p. 4, 7; Nordgold SE, 2018, p. 7; Roxgold Inc., 2018, p. 5). The increases more than offset a 14% decrease in gold production from SEMAFO Inc.'s Mana Mine (SEMAFO Inc., 2018, p. 24).

Canada.—Canada's gold mine output increased slightly in 2017 to 164,313 kg. The leading producer in the country was the Canadian Malartic Mine, jointly owned by Agnico Eagle Mines Ltd. (50%) and Yamana Gold Inc. (50%); output in 2017 was 19,700 kg of gold, 8% more than 2016 production owing to increased mill throughput and gold ore grades (Yamana Gold Inc., 2018, p. 63). The Detour Lake Mine (Detour Gold Corp.) produced 17,800 kg of gold in 2017, 6% more than that in 2016, owing to an increase in mill throughput and higher gold ore grades (Detour Gold Corp., 2018, p. 15). Agnico Eagle's LaRonde and Meadowbank Mines produced 10,900 kg (up by 14%) and 11,000 kg of gold (up by 13%), respectively. This more than offset the 8% production decrease from the company's Goldex Mine, which produced 3,450 kg during the year (Agnico Eagle Mines Ltd., 2018, p. MDA42–MDA44). Production from Goldcorp's Red Lake Mine was 6,500 kg of gold, 35% less than that produced in 2016 owing to lower ore grades and lower tonnage mined. The Musselwhite Mine produced 7,340 kg of gold, 10% less than in 2016, because lower ore grades more than offset the increased tonnage mined. The Éléonore Mine produced 9,490 kg, 11% more than in 2016 owing to increased ore tonnage mined and gold ore grades (Goldcorp Inc., 2018, p. 37–40). Gold production at Alamos

Gold Inc.'s Young-Davidson Mine was 6,220 kg, 18% more than 2016 production owing to an increase in ore production and higher gold ore grades (Alamos Gold Inc., 2018, p. 7). Kirkland Lake's Macassa Mine produced 6,040 kg of gold in 2017, an 11% increase from that in 2016, owing to more ore processed and an increase in gold ore grades (Kirkland Lake Gold Ltd., 2018, p. 21). Barrick's Hemlo Mine produced 6,100 kg of gold, 17% less than in 2016, because of a drop in gold ore grades (Barrick Gold Corp., 2018a; 2018b, p. 41).

Chile.—Reported gold production decreased by 22% in 2017 to 35,932 kg, mainly because of the temporary suspension of mining at Kinross's Maricunga Mine in August 2016. In 2017, the mine produced 2,830 kg of gold equivalent, or 48% less than the output in 2016 (Kinross Gold Corp., 2018, p. 5, 10). Yamana Gold Inc.'s El Peñón gold mine produced 4,990 kg of gold, 27% less than in 2016 owing to the temporary suspension of mining at the beginning of 2017 so as to allow the start of an optimization plan (Yamana Gold Inc., 2018, p. 62). The polymetallic Centinela Mine (Antofagasta plc, 70%, and Marubeni Corp., 30%) produced 4,880 kg of gold, 26% less than in 2016 owing to lower ore grades and recoveries (Antofagasta plc, 2018, p. 39).

China.—China continued to be the world's leading gold producer in 2017 despite a 6% decrease in production compared with that in 2016. In 2017, gold production was 426,142 kg. This was the first decrease since 2000 and stemmed from reforms to environmental and resource taxes, revocation of mineral rights for environmental protection, and suspended production at several mines. Gold production from gold mines was 369 t and byproduct output from other nonferrous metals mining was 57 t. The leading four companies—China Gold International Resources Corp. Ltd., Shandong Gold Group Co. Ltd., Zijin Mining Group Co. Ltd., and Shandong Zhaojin Group Co. Ltd. (in descending order of production)—produced almost one-half of the country's gold production (Precious Metals Monthly, 2018a, b).

According to the China Gold Association, China's gold consumption (which includes bullion consumption) in 2017 was 1,089,000 kg, an increase of 9.41%. The largest consumption of gold was for jewelry (697,000 kg), up by 10.4% or 65,700 kg. Consumption of gold bullion was 276,000 kg, an increase of 7.28% or 18,700 kg; consumption of gold for coin minting was 26,000 kg, an increase of 16.6% or 3,700 kg; and consumption of gold for industrial and other applications was 90,200 kg, an increase of 19.6% or 14,800 kg compared with that in 2016 (Precious Metals Monthly, 2018b).

Colombia.—Production was 52,200 kg of gold in 2017, a decrease of 16% when compared with 2016 production. Much of the decrease was caused by the Government's seizure of 45 illegal gold mines and its peace agreement with the Revolutionary Armed Forces of Colombia, which were involved in illegal gold mining. According to the United Nations Office on Drug and Crime, cultivation of coca had been rising in areas of illegal gold mines (O'Connell and others, 2018, p. 23).

Ghana.—Reported production of gold from large-scale producers in 2017 was 87,573 kg, which was 11% more than that in 2016. Estimated gold production from artisanal and small-scale producers was 40,000 kg, an 11% decrease owing

to Governmental programs to reduce environmental damages and the number of illegal mines. Kinross's Chirano Mine produced 7,650 kg of gold equivalent in 2017, about 16% more than production in 2016 owing to higher ore grades (Kinross Gold Corp., 2018, p. 10). Perseus Mining Ltd.'s Edikan Mine produced 6,480 kg of gold, 36% more than that in 2016 owing to improved mill efficiency and throughput (Perseus Mining Ltd., 2017, p. 2–3; 2018, p. 2–3). Asanko Gold Inc.'s Asanko Mine, which started up in 2016, continued to ramp up its operations; output for the year was 6,380 kg (Asanko Gold Inc., 2018, p. 6). Golden Star Resources Ltd.'s Wassa Mine produced 4,270 kg of gold, up by 31% because of increased mill throughput and gold ore grades from the underground operations. Golden Star's other mine, Prestea, produced 4,050 kg of gold in 2017, 45% more than in 2016 because of increased gold ore grades, mill throughput, and the ramp up of the underground operation (Golden Star Resources Ltd., 2018, p. 14, 16). In 2017, Ghana's three leading mines produced at similar levels to those in 2016—Gold Fields Ltd.'s Tarkwa Mine (17,600 kg), Newmont's Akyem Mine (14,700 kg), and Newmont's Ahafo Mine (10,900 kg) (Gold Fields Ltd., 2018, p. 49; Newmont Mining Corp., 2018a, p. 65).

Greece.—The reported gold production was 822 kg in 2017, a 713-kg increase over the 2016 production. On December 31, 2017, Eldorado Gold Corp.'s Olympias Mine achieved commercial production after completing the second phase of a mine redevelopment project. Olympias produced 575 kg of gold during the precommercial operations in 2017 (Eldorado Gold Corp., 2018, p. 17).

Guatemala.—With the closure of Goldcorp's Marlin Mine at the end of May 2017 (Goldcorp Inc., 2018, p. 10), gold production for the country decreased by 95% to 173 kg.

Indonesia.—In 2017, gold production, excluding illegal artisanal and small-scale gold mining, was an estimated 75,000 kg, slightly more than output in 2016. Freeport-McMoRan Inc.'s Grasberg Mine accounted for about 64% of gold production in Indonesia. Gold production at the copper mine Grasberg increased by 46% in 2017 to 48,300 kg owing to increases in gold ore grades and recovery rates (Freeport-McMoRan Inc., 2018, p. 24). Newcrest Mining Ltd.'s Gosowong Mine produced 9,360 kg of gold in 2017, a 67% increase compared with that in 2016; output in 2016 was affected by the temporary suspension of mining at the Kencana deposit to conduct a geotechnical study (Newcrest Mining Ltd., 2017, p. 5; 2018, p. 6). In contrast, gold output by PT Amman Mineral Internasional's Batu Hijau copper mine decreased by 20% to an estimated 20,000 kg. Although difficult to estimate, output by illegal artisanal and small-scale gold mines appeared to have decreased because of stricter environmental controls on mercury and cyanide (O'Connell and others, 2018, p. 22–23).

Kazakhstan.—The reported gold production was 85,029 kg in 2017, a 10,292-kg increase from that in 2016. In 2017, Kazzinc Ltd., a Glencore plc subsidiary, produced 18,200 kg of gold, 12% more than 2016 production. The increase in gold production was because of higher gold ore grades and recoveries at the Vasilkovsky Mine, combined with initial gold production from the Dolinnoe Mine (Glencore plc, 2018, p. 71). Production from Polymetal International plc's Varvara group of operations

[the Komar, Maminskoye (in Russia), Tarutin, and Varvara Mines] increased by 53% to 3,830 kg of gold. The growth was mainly because of increased ore production and gold ore grades at the Komar Mine, which more than offset the reduction in tonnage mined at the Varvara Mine (Polymetal International plc, 2018, p. 40, 176).

Mali.—The reported 2017 gold mine production increased by 12% to 46,483 kg owing to additional production from recently opened mines. On September 25, 2017, B2Gold Corp. began operations at its Fekola Mine and produced 3,470 kg of gold during the year (B2Gold Corp., 2018, p. 1). Robex Resources Inc.'s Nampala Mine began production in 2016 and in 2017 produced 1,150 kg of gold (Robex Resources Inc., 2018, p. 6–7). The leading gold producer was Randgold Resources Ltd.'s Loulo-Gounkoto complex, which produced 22,700 kg of gold, a 3% increase over the 2016 production (Randgold Resources Ltd., 2018, p. 23).

Mauritania.—The 2017 reported gold mine production increased to 9,096 kg, 28% more than output in 2016 because of increased gold production from Kinross's Tasiast Mine. The mine produced 7,570 kg of gold equivalent, a 39% increase compared with 2016 production owing to increased mill throughput and ore grades in 2017 and the impact of a temporary suspension of mining in 2016 (Kinross Gold Corp., 2018, p. 5, 10).

Mexico.—In 2017, estimated gold mine production in Mexico was 126,000 kg, a decrease of 5% from that in 2016. The leading gold-producing mine was Goldcorp's Peñasquito Mine, which produced 14,800 kg, slightly more than 2016 production (Goldcorp Inc., 2018, p. 29). In 2017, Fresnillo plc produced 28,300 kg of gold from seven mines in Mexico, 3% less than in 2016. A reduction in high-grade ore stockpiles at the Herradura Mine in 2016 and lower ore grades in 2017 were cited as reasons for the production decrease (Fresnillo plc, 2018, p. 3, 28, 60). On November 3, 2017, a blockade was started by a competing labor union with demands to change labor unions at Torex Gold Resources Inc.'s El Limón Guajes mining complex. The blockade resulted in a complete shutdown of the mine lasting until January 15, 2018. The complex's gold production was 7,490 kg, 14% less than 2016 production (Torex Gold Resources Inc., 2018, p. 1, 13).

Peru.—In 2017, gold production was 151,104 kg, slightly less than that in 2016. Production at large-scale mines increased slightly while placer production decreased by 17%, owing to Governmental enforcement against illegal artisanal mining in the La Pampa region; some output of which, however, was smuggled into Bolivia, and may have been reported as Bolivian production (O'Connell and others, 2018, p. 23). One of the largest year-on-year increases in gold production took place at Compañía de Minas Buenaventura S.A.A.'s Tambomayo project, located in Arequipa, which was commissioned in December 2016 (Compañía de Minas Buenaventura S.A.A., 2017). The Yanacocha Mine, jointly owned by Newmont and Compañía de Minas Buenaventura, produced about 16,600 kg of gold in 2017, a decline of 18% from that produced in 2016 because of lower mill grade, recovery, and throughput; the mine was nearing its end of mining operations (Newmont Mining Corp., 2018a, p. 63). In 2017, Barrick's Lagunas Norte Mine

produced 12,000 kg of gold, 11% less than 2016 production owing to a decrease in the gold ore grades and slower recovery rates resulting from processing older ore stockpiles (Barrick Gold Corp., 2018b, p. 55).

Russia.—In 2017, Russia produced 270,216 kg of gold, 6.7% more than production in 2016. The leading 10 mining companies in Russia were, in descending order of production, PJSC Polyus Gold (67,200 kg of gold, up by 10% compared with 2016), Polymetal International (28,800 kg, up by 16%), Kinross (16,300 kg, down by 21%), Yuzhuralzoloto ZAO (15,000 kg, up by 3%), Petropavlovsk PLC (13,700 kg, up by 5%), Nordgold (7,380 kg, down by 11%), PJSC “Vysochaishy” (GV Gold) (6,980 kg, up by 37%), Highland Gold Mining Ltd. (6,750 kg, down slightly), Arlan Investment Co. (6,390 kg, up by 75%), and Zoloto Kamchatki JSC (5,170 kg, down by 6%). Some of the notable increases were from new projects, such as GV Gold’s Taryn and Ugakhan Mines, Polyus’s Natalka Mine, and a new recovery plant at PJSC Seligdar’s Ryabinovaya Mine. Other operations that had an increase in production were Arlan’s Pavlik Mine, Polymet’s Svetloye and Solovyevskeye Mines, Seligdar’s Samolazovsk Mine, and Yuzhuralzoloto’s Berezyakovskaya Mine (Russia & CIS Metals and Mining Weekly, 2018b).

The increases were partially offset by a 21% decrease in production from Kinross’ 75%-owned Kupol operations owing to lower ore grades (Kinross Gold Corp., 2018, p. 5, 10). In 2017, Nordgold disposed of the Aprelkovo operations during bankruptcy procedures, and the mine produced almost 80% less compared with production in 2016. Nordgold’s Buryatzoloto and Neryungri Mines produced 22% and 16% less gold in 2017, respectively (Nordgold SE, 2018, p. 26, 100).

South Africa.—In 2017, gold production was 136,833 kg, almost 4% less than output in 2016. AngloGold’s South Africa gold production (the Kopanang, Moab Khotsong, Mponeng, and TauTona Mines, and sundry production from surface ore dumps and tailings) was 28,100 kg, 7% less than 2016 production. Production at the Mponeng Mine decreased because of safety-related work stoppages and lower gold ore grades, while production at the Moab Khotsong Mine increased because of a reduction in safety-related work stoppages. In September 2017, AngloGold decided to cease operations at the TuaTona Mine, because of production challenges owing to depleted ore reserves, lower ore grades, and more complex ore geology (AngloGold Ashanti Ltd., 2018, p. 75–78). Sibanye Gold Ltd. (Sibanye-Stillwater) operated four mines in South Africa (the Beatrix, Cooke, Driefontein, and Kloof Mines) and produced 43,600 kg of gold, 7% less than 2016 production. The primary reason for the decrease was the cessation of underground operations at Cooke, for which gold production in 2017 was 2,340 kg, 52% less than 2016 production (Sibanye Gold Ltd., 2018, p. 43). In 2017, Harmony Gold Mining Co. Ltd. produced 31,800 kg of gold from its South Africa operations, which was 9% more than 2016 production. Much of the increased gold production came from Doornkop and Target 1 Mines (Harmony Gold Mining Co. Ltd., 2017, p. 8–9; 2018, p. 4, 6). In 2017, Gold Fields Ltd.’s South Deep Mine produced 8,750 kg, 3% less than that in 2016 because of two fatal accidents and three fall-of-ground incidents in the first quarter of 2017 (Gold Fields Ltd., 2018, p. 2, 20).

Suriname.—In 2017, gold production increased by 7% to 27,300 kg as a result of increased production at Newmont’s newly opened Merian Mine, approximately 60 km south of Moengo. The mine produced 15,600 kg of gold during its first full year of production in 2017 (Newmont Mining Corp., 2018a, p. 63).

Tanzania.—The 2017 gold mine production decreased by 5% to 43,490 kg owing to a decrease in Acacia Mining plc’s Bulyanhulu output, which was 5,460 kg, 39% lower than that in 2016. The company decided to reduce operations because of the country’s export ban on copper and gold concentrates (Acacia Mining plc, 2018, p. 2).

Thailand.—With the closure of the Chatree gold mine, there was no production in 2017. Akara Resources Public Co. Ltd., a subsidiary of Kingsgate Consolidated Ltd., placed Chatree on care-and-maintenance status on January 1, 2017, in accordance with the closure order by the Thai Government over environmental concerns (Kingsgate Consolidated Ltd., 2018).

Turkey.—In 2017, gold production was estimated to have decreased by 14% to 21,000 kg. Eldorado Gold Corp.’s Kışladağ Mine produced 5,330 kg of gold, a 23% decrease compared with that in 2016 owing to a decrease in the amount of ore being placed on the leach pads (Eldorado Gold Corp., 2018, p. 14). In contrast, gold production at the Çöpler Mine (Alacer Gold Corp., 80%, and Çalık Holding AŞ, 20%) increased by 41% to 5,230 kg. Output rose because of an increase in the amount of higher grade ore placed on the leach pads (Alacer Gold Corp., 2018, p. 8–9).

Outlook

Historically, investors have purchased gold as a safe haven, hedge against economic failures, portfolio diversifier, and store of wealth. In 2018, global consumption of gold is expected to be about the same as in 2017, because any decline in jewelry purchases resulting from gold price increases is expected to be offset by increased gold demand by investors. Overall, worldwide gold mine production is expected to increase slightly; however, U.S. gold production is expected to decrease because of lower output from the Cortez, Cripple Creek, and Fort Knox Mines.

References Cited

- Acacia Mining plc, 2018, A committed partner—Annual report & accounts 2017: London, United Kingdom, Acacia Mining plc, 177 p. (Accessed August 29, 2018, at <http://www.acaciaming.com/~media/Files/A/Acacia/reports/2018/2017-acacia-annual-report-accounts.pdf>.)
- Agnico Eagle Mines Ltd., 2018, Preparing for the future—2017 annual report and management’s discussion and analysis: Toronto, Ontario, Canada, Agnico Eagle Mines Ltd., 160 p. (Accessed August 30, 2018, at https://s21.q4cdn.com/374334112/files/annual_reports/2017/AEM-/AR17.pdf.)
- Alacer Gold Corp., 2018, Management’s discussion and analysis—For the year ended December 31, 2017: Denver, CO, Alacer Gold Corp., 33 p. (Accessed September 13, 2018, at <http://www.alacergold.com/docs/default-source/Regulatory-Filings/2017-q4-mda-final3482da6bd1286d1694b8ff0000b8a5bc.pdf?sfvrsn=2>.)
- Alamos Gold Inc., 2018, Alamos Gold reports fourth quarter and year-end 2017 results: Toronto, Ontario, Canada, Alamos Gold Inc. news release, February 22, 26 p. (Accessed September 11, 2018, at https://s1.q4cdn.com/556167425/files/doc_news/2018/02/20170222-Alamos-Q4-2017-Earnings-Release_FINAL.pdf.)
- AngloGold Ashanti Ltd., 2018, Integrated report 2017: Johannesburg, South Africa, AngloGold Ashanti Ltd., 199 p. (Accessed September 18, 2018, at <http://www.aga-reports.com/17/download/AGA-IR17.pdf>.)

- Antofagasta plc, 2018, Annual report and financial statements 2017: London, United Kingdom, Antofagasta plc, 212 p. (Accessed September 18, 2018, at <http://www.antofagasta.co.uk/media/3388/antofagasta-2017-annual-report-and-financial-statements.pdf>.)
- Asanko Gold Inc., 2018, Management's discussion and analysis for the year ended December 31, 2017: Vancouver, British Columbia, Canada, Asanko Gold Inc., 33 p. (Accessed September 18, 2018, at https://s21.q4cdn.com/214525344/files/doc_financials/2017/q4/AKG-December-31-2017-MD-A_FINAL.pdf.)
- B2Gold Corp., 2018, Management's discussion and analysis for the year ended December 31, 2017: Vancouver, British Columbia, Canada, B2Gold Corp., 51 p. (Accessed September 17, 2018, at http://www.b2gold.com/_resources/financials/Final-MDA-as-filed-on-SEDAR-Q4-2017.pdf.)
- Barrick Gold Corp., 2018a, 2017 Q4 and year-end mine statistics: Toronto, Ontario, Canada, Barrick Gold Corp., 6 p. (Accessed March 20, 2018, at <https://barrick.q4cdn.com/788666289/files/quarterly-report/2018/Barrick-Mine-Stats-2017-Q4.pdf>.)
- Barrick Gold Corp., 2018b, A company of owners—Annual report 2017: Toronto, Ontario, Canada, Barrick Gold Corp., 180 p. (Accessed August 24, 2018, at https://barrick.q4cdn.com/788666289/files/doc_financials/annual/2017/Barrick-Annual-Report-2017.pdf.)
- Coeur Mining, Inc., 2018, Coeur reports fourth quarter and full-year 2017 results and provides 2018 cost guidance: Chicago, IL, Coeur Mining, Inc. news release, February 7, 24 p. (Accessed August 24, 2018, at https://www.coeur.com/_resources/news/nr_20180207.pdf.)
- Compañía de Minas Buenaventura S.A.A., 2017, Buenaventura reaches commercial production at Tambomayo: Lima, Peru, Compañía de Minas Buenaventura S.A.A. press release, September 5, 1 p. (Accessed September 13, 2018, at http://www.buenaventura.com/assets/uploads/reportes_de_prensa/2017/786a9e4c00fe9b3d9dfa7fe0163bcaa8-en.pdf.)
- Detour Gold Corp., 2018, Management's discussion and analysis—Years ended December 31, 2017 and 2016: Toronto, Ontario, Canada, Detour Gold Corp., 46 p. (Accessed August 30, 2018, via <http://www.detourgold.com>.)
- Eldorado Gold Corp., 2018, Tomorrow, together—Eldorado Gold year in review 2017: Vancouver, British Columbia, Canada, Eldorado Gold Corp., 84 p. (Accessed August 30, 2018, at [https://s2.q4cdn.com/536453762/files/doc_downloads/sustainability_report/0222_YIR_WEB-\(1\).pdf](https://s2.q4cdn.com/536453762/files/doc_downloads/sustainability_report/0222_YIR_WEB-(1).pdf).)
- Endeavour Mining Corp., 2018, Endeavour reports strong FY-2017 results: London, United Kingdom, Endeavour Mining Corp. news release, March 13, 30 p. (Accessed September 11, 2018, at https://s21.q4cdn.com/954147562/files/doc_news/2018/03/q4earnings.pdf.)
- Freeport-McMoRan Inc., 2018, Powered by copper—2017 annual report: Phoenix, AZ, Freeport-McMoRan Inc., 133 p. (Accessed August 29, 2018, at https://s22.q4cdn.com/529358580/files/doc_financials/annual/FCX_AR_2017.pdf.)
- Fresnillo plc, 2018, Creating value through growth and returns—Annual reports and accounts 2017: Mexico City, Mexico, Fresnillo plc, 280 p. (Accessed September 19, 2018, at <http://www.fresnilloplc.com/media/367009/FRES-28347-AR2017-WEB.pdf>.)
- Glencore plc, 2018, Annual report 2017: Baar, Switzerland, Glencore plc, 220 p. (Accessed September 20, 2018, at <http://www.glencore.com/dam/jcr:62bed41c-1627-4bf5-bc43-cf5518ba1193/glen-2017-annual-report.pdf>.)
- Gold Fields Ltd., 2018, 2017 integrated annual report: Johannesburg, South Africa, Gold Fields Ltd., 140 p. (Accessed August 30, 2018, at <https://www.goldfields.com/pdf/investors/integrated-annual-reports/2017/iar-2017.pdf>.)
- Goldcorp Inc., 2018, Annual report 2017: Vancouver, British Columbia, Canada, Goldcorp Inc., 66 p. plus financial statements. (Accessed August 29, 2018, at https://s22.q4cdn.com/653477107/files/doc_financials/2017/Goldcorp-2017-Annual-Report.pdf.)
- Golden Queen Mining Co. Ltd., 2018, Form 10-K—2017: U.S. Securities and Exchange Commission, 52 p. (Accessed April 4, 2018, at <https://www.goldenqueen.com/assets/docs/pdf/financials/GQM.Form10K.MASTER.pdf>.)
- Golden Star Resources Ltd., 2018, Management's discussion and analysis for the year ended December 31, 2017: Toronto, Ontario, Canada, Golden Star Resources Ltd., 26 p. (Accessed September 18, 2018, at http://s1.q4cdn.com/789791377/files/doc_financials/2017/FullYear2017MD-A.PDF.)
- Harmony Gold Mining Co. Ltd., 2017, FY17 interim results—For the six months ended 31 December 2016: Randfontein, South Africa, Harmony Gold Mining Co. Ltd., 30 p. (Accessed September 18, 2018, at <https://www.harmony.co.za/downloads/send/121-q2-fy2017/2294-interim-results-for-the-six-months-ended-31-december-2016>.)
- Harmony Gold Mining Co. Ltd., 2018, FY18 interim results—For the six months ended 31 December 2017: Randfontein, South Africa, Harmony Gold Mining Co. Ltd., 30 p. (Accessed September 18, 2018, at <https://www.harmony.co.za/downloads/send/132-q2-fy2018/2600-interim-results-for-the-six-months-ended-31-december-2017>.)
- Hecla Mining Co., 2018, Hecla reports fourth quarter and year 2017 results: Coeur d'Alene, ID, Hecla Mining Co. press release, February 15, 18 p. (Accessed March 21, 2018, at <http://ir.hecla-mining.com/file/Index?KeyFile=392200669>.)
- Kingsgate Consolidated Ltd., 2018, Quarterly report for the period ending 31 December 2017: Sydney, New South Wales, Australia, Kingsgate Consolidated Ltd., 7 p. (Accessed September 11, 2018, at <http://www.kingsgate.com.au/wp-content/uploads/2018/01/1764503.pdf>.)
- Kinross Gold Corp., 2018, Kinross reports 2017 fourth-quarter and full-year results: Toronto, Ontario, Canada, Kinross Gold Corp. news release, February 14, 21 p. (Accessed August 21, 2018, at http://s2.q4cdn.com/496390694/files/doc_news/2018/02/KGC-Q4-year-end-2017-news_release_Final.pdf.)
- Kirkland Lake Gold Ltd., 2018, Management's discussion and analysis—For the years ended December 31, 2017 and 2016: Toronto, Ontario, Canada, Kirkland Lake Gold Ltd., 60 p. (Accessed August 29, 2018, at http://s21.q4cdn.com/967674075/files/doc_financials/2017/Quarterly/q4/KLG-LTD-MDA-Q4-2017-Final-Clean.pdf.)
- Klondex Mines Ltd., 2016, Klondex announces agreement to acquire the Hollister Mine and C\$100 million subscription receipt offering: Vancouver, British Columbia, Canada, Klondex Mines Ltd. news release, July 25. (Accessed September 9, 2016, via <https://www.klondexmines.com>.)
- Klondex Mines Ltd., 2017, Form 10-K—2016: U.S. Securities and Exchange Commission, 88 p. plus exhibits. (Accessed September 28, 2017, via <https://www.klondexmines.com>.)
- Klondex Mines Ltd., 2018, Klondex reports fourth quarter and full-year 2017 financial results: Vancouver, British Columbia, Canada, Klondex Mines Ltd., March 14, 18 p. (Accessed March 21, 2018, via <https://www.klondexmines.com>.)
- Lasley, Shane, 2018, Pogo discoveries excite exploration team: North of 60 Mining News [Eagle River, AK], April 13. (Accessed August 28, 2018, at <https://www.miningnewsnorth.com/story/2018/04/06/news/pogo-discoveries-excite-exploration-team/5118.html>.)
- Nehamas, Nicholas, 2018, Three dirty Miami gold traders 'chewed up and spit out' hundreds of Ohio factory workers: Miami [FL] Herald, January 16. (Accessed March 28, 2018, at <http://www.miamiherald.com/news/nation-world/national/article194187909.html>.)
- New Gold Inc., 2018, Management's discussion and analysis—For the year ended December 31, 2017: Vancouver, British Columbia, Canada, New Gold Inc., 116 p. (Accessed March 21, 2018, at http://s1.q4cdn.com/240714812/files/documents_financials/2018/New-Gold-Management-Information-Circular-March-16-2018.pdf.)
- Newcrest Mining Ltd., 2017, Quarterly report—For the three months ended 30 June 2017: Melbourne, Victoria, Australia, Newcrest Mining Ltd., 15 p. (Accessed August 29, 2018, at http://www.newcrest.com.au/media/quarterly_reports/June_2017_Quarterly_Results.pdf.)
- Newcrest Mining Ltd., 2018, Quarterly report—For the three months ended 31 December 2017: Melbourne, Victoria, Australia, Newcrest Mining Ltd., 15 p. (Accessed August 29, 2018, at http://www.newcrest.com.au/media/quarterly_reports/Newcrest_Quarterly_Report_Final.pdf.)
- Newmont Mining Corp., 2018a, Leading in profitability and responsibility—2017 annual report and Form 10-K: Greenwood Village, CO, Newmont Mining Corp., [variously paged]. (Accessed July 10, 2018, at [https://s1.q4cdn.com/259923520/files/doc_financials/annual/2017/2017-Newmont-Annual-Report-Web-Posting-Bookmarked-PDF-\(002\).pdf](https://s1.q4cdn.com/259923520/files/doc_financials/annual/2017/2017-Newmont-Annual-Report-Web-Posting-Bookmarked-PDF-(002).pdf).)
- Newmont Mining Corp., 2018b, Regional operating statistics—Fourth quarter and full year 2017: Greenwood Village, CO, Newmont Mining Corp., 17 p. (Accessed March 21, 2018, at https://s1.q4cdn.com/259923520/files/doc_financials/quarterly/2017/Q1/Q12017_Operating-Statistics.pdf.)
- Nordgold SE, 2018, 10—A golden decade—2017 annual report: London, United Kingdom, Nordgold SE, 164 p. (Accessed August 28, 2018, at <http://www.nordgold.com/upload/iblock/c2c/2017%20Nordgold%20Annual%20Report.pdf>.)
- Northern Star Resources Ltd., 2017, December 2016 quarterly activities report—Northern Star on track to hit both guidance and growth targets: Subiaco, Western Australia, Australia, Northern Star Resources Ltd., 13 p. (Accessed August 30, 2018, at <https://www.nsrld.com/wp-content/uploads/2017/01/December-Quarterly-Report-Final-25-1-2017.pdf>.)

- Northern Star Resources Ltd., 2018, December 2017 quarterly activities report—Production and cost on track; growth strategy accelerated: Subiaco, Western Australia, Australia, Northern Star Resources Ltd., 13 p. (Accessed August 30, 2018, at <https://www.nsrltd.com/wp-content/uploads/2018/01/December-2017-Quarterly-Report-25-01-2018-Final.pdf>.)
- OceanaGold Corp., 2017, OceanaGold announces first gold pour at the Haile gold mine in South Carolina: Melbourne, Victoria, Australia, OceanaGold Corp. media release, January 20, 4 p. (Accessed February 7, 2018, at <http://www.oceanagold.com/wp-content/uploads/2017/01/170120-OceanaGold-Haile-First-Gold-Pour-News-Release.pdf>.)
- OceanaGold Corp., 2018, Full year 2017 results—Management discussion and analysis for the full year ended December 31, 2017: Melbourne, Victoria, Australia, OceanaGold Corp., February 22, 29 p. (Accessed July 11, 2018, at <http://www.oceanagold.com/wp-content/uploads/2018/02/OceanaGold-Q4-2017-MDA.pdf>.)
- O’Connell, Rhona, Alexander, Cameron, Strachan, Ross, Alway, Bruce, Nambiath, Sudheesh, Wiebe, Johanna, Li, Samson, Scott-Gray, Natalie, Aranda, Dante, and Chan, Zen, 2018, GFMS gold survey 2018: London, United Kingdom, Thomson Reuters Ltd., May, 83 p.
- Perseus Mining Ltd., 2017, December 2016 quarterly report: Subiaco, Western Australia, Australia, Perseus Mining Ltd. news release, January 27, 19 p. (Accessed February 2, 2018, at http://www.perseusmining.com/aurora/assets/user_content/1638369.pdf.)
- Perseus Mining Ltd., 2018, December 2017 quarter activities report: Subiaco, Western Australia, Australia, Perseus Mining Ltd. news release, January 30, 20 p. (Accessed September 18, 2018, at [http://perseusmining.com/aurora/assets/user_content/1763774\(1\).pdf](http://perseusmining.com/aurora/assets/user_content/1763774(1).pdf).)
- Polymetal International plc, 2018, 20 years of sustainable development—Annual report 2017: St. Helier, Jersey [United Kingdom], Polymetal International plc, 194 p. (Accessed September 20, 2018, at https://www.polymetalinternational.com/upload/iblock/fe3/Polymetal_annual_report_2017_interactive.pdf.)
- Precious Metals Monthly, 2018a, Annual output of gold in China shrinks for the first time since the year 2000: Precious Metals Monthly [published by Beijing Antaika Information Development Co., Ltd., or Antaika], no. 69, March, p. 19.
- Precious Metals Monthly, 2018b, Market overview—Gold: Precious Metals Monthly [published by Beijing Antaika Information Development Co., Ltd., or Antaika], no. 69, March, p. 2–8.
- Randgold Resources Ltd., 2018, Annual report 2017—Investing in the future: St. Helier, Jersey [United Kingdom], Randgold Resources Ltd., 272 p. (Accessed September 18, 2018, at http://reports.randgoldresources.com/sites/default/files/2018-04/RRL_Full_annual_report_2017_LowRes_incl_Financial_Statements_2.pdf.)
- Rio Tinto plc, 2018, Rio Tinto releases fourth quarter production results: London, United Kingdom, Rio Tinto plc, media release, January 16, 28 p. (Accessed March 21, 2018, at http://www.riotinto.com/documents/180116_Rio_Tinto_releases_fourth_quarter_production_results.pdf.)
- Robex Resources Inc., 2018, Management’s discussion and analysis—2017: Quebec City, Quebec, Canada, Robex Resources Inc., 31 p. (Accessed September 17, 2018, at <http://robexgold.com/wp-content/uploads/2018/04/Robex-MDA-2017.pdf>.)
- Roxgold Inc., 2018, Annual information form for the fiscal year ended December 31, 2017: Toronto, Ontario, Canada, Roxgold Inc., March 28, 79 p. (Accessed September 12, 2018, at https://s22.q4cdn.com/726251528/files/doc_financials/annual/Roxgold-AIF-2017.pdf.)
- Russia & CIS Metals and Mining Weekly, 2018a, Azerbaijan more than triples gold output in 2017: Russia & CIS Metals and Mining Weekly [published by Interfax Ltd.], v. 28, issue 02, January 12–18, p. 29.
- Russia & CIS Metals and Mining Weekly, 2018b, Russia could up gold production 3% to 328 tonnes in 2018—Gold Mining Union: Russia & CIS Metals and Mining Weekly [published by Interfax Ltd.], v. 28, no. 09, March 2–7, p. 4–5.
- S&P Global Market Intelligence, 2017, Corporate exploration strategies 2017—Trends in exploration budget by target: Charlottesville, VA, S&P Global Market Intelligence, 47 p. (Accessed November 29, 2017, via <http://www.snl.com/>.)
- Scorpio Gold Corp., 2018, Scorpio Gold reports annual gold production at Mineral Ridge operations, Nevada: Vancouver, British Columbia, Canada, Scorpio Gold Corp. news release, January 10. (Accessed March 21, 2018, at <http://www.scorpriogold.com/s/news.asp?ReportID=775307>.)
- SEMAFO Inc., 2018, Annual information form for the year ended December 31, 2017: Saint-Laurent, Quebec, Canada, SEMAFO Inc., March 29, 61 p. (Accessed September 12, 2018, at https://s2.q4cdn.com/795832262/files/doc_financials/2018/AIF_2017_EN.pdf.)
- Sibanye Gold Ltd., 2018, Integrated annual report 2017: Westonaria, South Africa, Sibanye Gold Ltd., 169 p. (Accessed September 19, 2018, at <http://reports.sibanyestillwater.com/2017/download/SBY-IAR2017.pdf>.)
- SSR Mining Inc., 2018, Management’s discussion and analysis for the year ended December 31, 2017: Vancouver, British Columbia, Canada, SSR Mining Inc., 40 p. (Accessed March 21, 2018, at [http://s22.q4cdn.com/546540291/files/doc_downloads/Shareholders/2018/SSR-Mining-2018-NAA-Dual-Notice-Final\).pdf](http://s22.q4cdn.com/546540291/files/doc_downloads/Shareholders/2018/SSR-Mining-2018-NAA-Dual-Notice-Final).pdf).)
- Torex Gold Resources Inc., 2018, Management’s discussion and analysis—For the year ended December 31, 2017: Toronto, Ontario, Canada, Torex Gold Resources Inc., p. 40 (Accessed September 19, 2018, at <https://www.torexgold.com/assets/docs/fs/MDA%20Q4%202017-%20FILING.pdf>.)
- U.S. Government Accountability Office, 2018, Conflict minerals rule—Company reports on mineral sources in 2017 are similar to prior years and new data on sexual violence are available: Washington, DC, U.S. Government Accountability Office, GAO–18–457, June, 28 p. (Accessed August 22, 2018, at <https://www.gao.gov/assets/700/692851.pdf>.)
- U.S. Government Printing Office, 2010, Public Law 111–203–21, 2010—Dodd-Frank Wall Street Reform and Consumer Protection Act: Washington, DC, U.S. Government Printing Office, July 21, 2,223 p.
- U.S. Mint, 2018, Bullion sales: Washington, DC, U.S. Mint. (Accessed June 6, 2018, via <https://www.usmint.gov/about/production-sales-figures/bullion-sales>.)
- Webb, Jonathan, 2015, Ridding the supply chain of conflict minerals: Forbes, November 16. (Accessed April 8, 2016, at <http://www.forbes.com/sites/jwebb/2015/11/16/ridding-the-supply-chain-of-conflict-minerals/#42212274656c>.)
- Yamana Gold Inc., 2018, Quality. Growth. Value.—Annual report 2017: Toronto, Ontario, Canada, Yamana Gold Inc., 182 p. (Accessed August 30, 2018, at https://s22.q4cdn.com/899716706/files/doc_financials/annual/2017/2017-Annual-Report-Final-e-sig.pdf.)

GENERAL SOURCES OF INFORMATION

U.S. Geological Survey Publications

- Conflict Minerals from the Democratic Republic of the Congo—Gold Supply Chain. Fact Sheet 2015–3075, 2015.
- Estimated Water Requirements for Gold Heap-Leach Operations. Open-File Report 2012–1085, 2012.
- Geology and Resources of Gold in the United States. Bulletin 1857, 1988.
- Gold. Ch. in Mineral Commodity Summaries, annual.
- Gold. Ch. in United States Mineral Resources, Professional Paper 820, 1973.
- Gold. Mineral Industry Surveys, monthly.
- Gold (Au). Ch. in Metal Prices in the United States Through 2010, Scientific Investigations Report 2012–5188, 2013.
- Gold Recycling in the United States in 1998. Ch. in Flow Studies for Recycling Metal Commodities in the United States, Circular 1196–A—M, 2004.
- Historical Statistics for Mineral and Material Commodities in the United States. Data Series 140.
- Principal Gold-Producing Districts of the United States. Professional Paper 610, 1968.
- Review of Selected Global Mineral Industries in 2011 and an Outlook to 2017. Open-File Report 2013–1091, 2013.

Other

- Gold. Ch. in Mineral Facts and Problems, U.S. Bureau of Mines Bulletin 675, 1985.
- World Gold—A Minerals Availability Appraisal. U.S. Bureau of Mines Special Publication 24, 1994.9

TABLE 1
SALIENT GOLD STATISTICS¹

		2013	2014	2015	2016	2017
United States:						
Production:						
Mine:						
Quantity	kilograms	230,000	210,000	214,000	228,000 ^r	237,000
Value	thousands	\$10,400,000	\$8,570,000	\$8,000,000	\$9,190,000 ^r	\$9,600,000
Gold recovered by cyanidation, leached in open heaps or dumps ²	kilograms	196,000	173,000	192,000	200,000	222,000
Refinery:						
From ore concentrates and dore	do.	223,000	253,000	248,000	248,000	212,000
From recycled materials (new and old scrap)	do.	210,000	135,000	124,000	123,000	96,300
Exports, refined bullion	do.	484,000	370,000	352,000	241,000	281,000
Imports for consumption, refined bullion	do.	98,700	121,000	89,800	177,000	99,900
Stocks, December 31:						
Industry ³	do.	5,940	7,540	7,330	4,110	1,770
Gold exchange traded funds holdings ⁴	do.	1,810,000	1,660,000	1,530,000	2,070,000 ^r	2,250,000
COMEX inventories	do.	243,000	325,000	198,000	285,000	284,000
U.S. Department of the Treasury	do.	8,140,000	8,140,000	8,140,000	8,140,000	8,140,000
Consumption:						
American Buffalo gold bullion coin ⁵	do.	7,430	5,520	6,860	6,830	3,100
American Eagle gold bullion coin ⁵	do.	24,100	16,300	24,900	30,600	9,410
Jewelry, industry, and the arts	do.	160,000	152,000	165,000	169,000 ^r	146,000
Price, average ⁶	dollars per troy ounce	1,414.80	1,269.45	1,163.33	1,252.17	1,260.90
Employment, mine and mill only ⁷		12,500	12,000	11,900	11,900	12,000
World:						
Production, mine	kilograms	2,960,000 ^r	3,050,000 ^r	3,120,000 ^r	3,180,000 ^r	3,230,000
Official bullion reserves ⁸	do.	31,900,000	32,000,000	32,700,000	33,300,000	33,600,000

^rRevised. do. Ditto.

¹Table includes data available through March 27, 2019. Data are rounded to no more than three significant digits, except prices.

²May include tailings, waste dumps, and previously mined ore at some inactive mines.

³Unfabricated refined gold held by refiners, fabricators, and dealers.

⁴Data from Gold Fields Mineral Services Ltd., Thomson Reuters.

⁵Data from the U.S. Mint.

⁶Annual average daily Engelhard quotation.

⁷Data from the U.S. Mine Safety and Health Administration.

⁸Held by central banks, Governments, and international monetary organizations at the end of the year. Data from the World Gold Council.

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

(Kilograms)

State	2016	2017
Alaska	27,600	26,200
Nevada	171,000 ^r	173,000
Other States ²	30,000	37,400
Total	228,000 ^r	237,000

^rRevised.

¹Table includes data available through March 27, 2019. Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes Arizona, California, Colorado, Idaho, Michigan, Montana, New Mexico, South Dakota, Utah, and Washington.

TABLE 3
LEADING GOLD-PRODUCING OPERATIONS IN THE UNITED STATES, IN ORDER OF PUBLICLY AVAILABLE OUTPUT¹

(Kilograms)

Rank	Operation	County and State ²	Majority owner ³	Quantity	
				2016	2017
1	Cortez Operations	Eureka and Lander, NV	Barrick Gold Corp.	37,000 ^r	38,500
2	Carlin Mines Operations ⁴	Elko, Eureka, and Humboldt, NV	Newmont Mining Corp.	29,400	30,200
3	Goldstrike	Elko and Eureka, NV	Barrick Gold Corp.	29,900 ^r	23,800
4	Cripple Creek	Teller, CO	Newmont Mining Corp.	12,300	14,000
5	Round Mountain	Nye, NV	Kinross Gold Corp.	11,800 ⁵	13,600 ⁵
6	Fort Knox	Eastern Interior Region, AK	do.	12,700 ⁵	11,900 ⁵
7	Twin Creeks	Humboldt, NV	Newmont Mining Corp.	14,100	11,700
8	Bald Mountain	White Pine, NV	Kinross Gold Corp.	4,050 ⁵	8,790 ⁵
9	Turquoise Ridge	Humboldt, NV	Barrick Gold Corp. (75%), Newmont Mining Corp. (25%)	11,000	8,750
10	Pogo	Eastern Interior Region, AK	Sumitomo Metal Mining Co., Ltd. (85%), Sumitomo Corp. (15%)	8,380	8,400
11	Phoenix	Lander, NV	Newmont Mining Corp.	6,500	7,430
12	Marigold	Humboldt, NV	SSR Mining Inc. ⁶	6,380 ⁷	6,290 ⁷
13	Bingham Canyon	Salt Lake, UT	Rio Tinto Kennecott Corp. ⁸	4,770	5,530
14	Long Canyon	Elko, NV	Newmont Mining Corp.	684	5,410
15	Mesquite	Imperial, CA	New Gold Inc.	3,460	5,250
16	Arturo	Elko, NV	Barrick Gold Corp. (60%), Premier Gold Mines Ltd. (40%)	6,940	4,440
17	Jerritt Canyon	do.	Sprout Mining Inc.	4,390 ^r	4,030
18	Haile	Lancaster, SC	OceanaGold Corp.	--	3,690
19	Kensington	Southeastern Region, AK	Coeur Mining, Inc.	3,870	3,580
20	Fire Creek	Lander, NV	Klondex Mines Ltd.	3,150 ^r	3,330
21	Wharf	Lawrence, SD	Coeur Mining, Inc.	3,410 ^r	2,970
22	Kettle River-Buckhorn	Okanogan, WA	Kinross Gold Corp.	3,490 ⁵	2,380 ⁵
23	Rochester	Pershing, NV	Coeur Mining, Inc.	1,580	1,590
24	Greens Creek	Southeastern Region, AK	Hecla Mining Co.	1,680	1,580
25	Soledad Mountain	Kern, CA	Golden Queen Mining Co. Ltd. (50%), Jefferies Financial Group (37.73%), Auvergne, LLC (12.27%)	592	1,430
26	Golden Sunlight	Jefferson, MT	Barrick Gold Corp.	1,060	1,280
27	Robinson	White Pine, NV	KGHM International Ltd.	1,530 ^r	1,180
28	Midas	Elko, NV	Klondex Mines Ltd.	920 ^r	1,070
29	Florida Canyon	Pershing, NV	Rye Patch Gold Corp.	338	876
30	Mineral Ridge	Esmeralda, NV	Scorpio Gold Corp. (70%), Waterton Global Resource Management, Inc. (30%)	1,150	592
31	Rawhide	Mineral, NV	Coral Reef Capital L.L.C.	559	572
32	Pan	White Pine, NV	Fiore Gold Ltd.	271	487
33	Hollister	Elko, NV	Klondex Mines Ltd.	--	239
34	Ruby Hill	Eureka, NV	Waterton Global Resource Management, Inc.	201	139
35	Golden Chest	Shoshone, ID	New Jersey Mining Co.	--	109
36	Hycroft	Humboldt and Pershing, NV	Hycroft Mining Co.	1,000 ^r	58
37	Aurora	Mineral, NV	Klondex Mines Ltd.	--	29
38	Borealis	do.	Waterton Global Resource Management, Inc. (64%), Gryphon Gold Corp. (36%)	19	9
XX	Briggs	Inyo, CA	DV Natural Resources LLC	NA	--
XX	Comstock	Storey, NV	Comstock Mining, Inc.	127	--
XX	Sterling	Nye, NV	Northern Empire Resources Corp.	11	--
(9)	Bagdad	Yavapai, AZ	Freeport-McMoRan Copper & Gold Inc.	NA	NA
(9)	Chino	Grant, NM	do.	NA	NA
(9)	Eagle	Marquette, MI	Lundin Mining Corp.	NA	NA
(9)	Morenci	Greenlee, AZ	Freeport-McMoRan Copper & Gold Inc.	NA	NA
(9)	Stillwater	Stillwater, MT	Sibanye Gold Ltd.	351	NA

See footnotes at end of table.

TABLE 3—Continued
LEADING GOLD-PRODUCING OPERATIONS IN THE UNITED STATES, IN ORDER OF PUBLICLY AVAILABLE OUTPUT¹

(Kilograms)

¹Revised. do. Ditto. NA Not available from publicly available information. XX Not applicable. -- Zero.

¹Table includes data available through March 27, 2019. Data are rounded to no more than three significant digits; the operations listed accounted for more than 99% of U.S. output in 2017. Data shown are from publicly available information and may differ from proprietary information used to generate the U.S. totals listed in tables 1 and 8.

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—Exploration activity.

³When multiple owners are listed, the operating owner is listed first, and when only one owner is listed, the company has full ownership. As of December 31, 2017.

⁴Includes four open pit operations and four underground operations. Does not include Long Canyon, Phoenix, Twin Creeks, and joint-venture underground Turquoise Ridge mines, which are listed separately.

⁵Quantity refers to the reported total gold equivalent of coproduct or byproduct metals recovered.

⁶On August 1, 2017, Silver Standard Resources Inc. was renamed as SSR Mining Inc.

⁷Quantity refers to total quantity of gold content of concentrates produced.

⁸Wholly owned subsidiary of Rio Tinto plc.

⁹The rank order is not shown to avoid disclosing company proprietary data.

Sources: Company annual reports, company 10-K reports submitted to the U.S. Securities and Exchange Commission, and State Geologists.

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

(Kilograms, gold content, and thousand dollars)

Year and country or locality	Ores and concentrates ²		Dore and precipitates		Refined bullion ³		Total	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
2016	4,220	157,000	147,000	5,730,000	241,000	9,650,000	393,000	15,500,000
2017:								
Australia	(4)	6	--	--	2,550	98,400	2,550	98,400
Austria	--	--	--	--	55	1,850	55	1,850
Bolivia	--	--	--	--	20	769	20	769
Canada	8	286	759	29,700	1,270	50,900	2,030	80,900
Cayman Islands	--	--	--	--	132	5,260	132	5,260
China	3,550	135,000	2	72	14,100	569,000	17,700	704,000
Germany	(4)	3	2	80	2,040	75,800	2,040	75,900
Guatemala	--	--	--	--	37	1,530	37	1,530
Hong Kong	33	1,350	2,000	85,300	97,600	3,840,000	99,600	3,930,000
India	1	50	38,900	1,580,000	14,200	570,000	53,100	2,150,000
Israel	1	18	13	533	3	133	17	684
Italy	--	--	1,770	69,400	380	14,400	2,150	83,800
Japan	1	39	--	--	6	221	6	261
Korea, Republic of	8	322	--	--	13	452	21	774
Laos	--	--	--	--	11	398	11	398
Liechtenstein	--	--	--	--	173	6,540	173	6,540
Malaysia	--	--	--	--	11	422	11	422
Mexico	--	--	102	4,350	796	31,800	898	36,100
Netherlands	--	--	--	--	21	685	21	685
Oman	--	--	--	--	32	1,260	32	1,260
Pakistan	--	--	--	--	55	2,210	55	2,210
Panama	--	--	39	1,520	10	379	49	1,900
Poland	--	--	--	--	188	6,960	188	6,960
Singapore	--	--	--	--	1,220	47,200	1,220	47,200
South Africa	--	--	--	--	7	276	7	276
Switzerland	--	--	117,000	4,800,000	30,900	1,250,000	148,000	6,040,000
Taiwan	--	--	--	--	25	892	25	892
Thailand	--	--	--	--	13	546	13	546
Turkey	--	--	--	--	261	10,500	261	10,500
United Arab Emirates	--	--	14,100	569,000	617	24,400	14,700	593,000
United Kingdom	(4)	7	1,060	43,500	115,000	4,690,000	116,000	4,730,000
Vietnam	--	--	(4)	6	51	1,980	51	1,980
Other	4	139	(4)	6	8	306	12	452
Total	3,610	137,000	176,000	7,180,000	281,000	11,300,000	461,000	18,600,000

-- Zero.

¹Table includes data available through March 27, 2019. Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes base-metal ores, concentrates, and matte destined for refining.

³Bullion also moves in both directions between U.S. markets and foreign stocks on deposit in the Federal Reserve Bank. Monetary gold is excluded.

⁴Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 5
U.S. EXPORTS OF GOLD-BEARING MATERIALS, BY COUNTRY OR LOCALITY¹

(Kilograms, gross weight, and thousand dollars)

Year and country or locality	Waste and scrap		Metal powder		Gold compounds	
	Quantity	Value	Quantity	Value	Quantity	Value
2016	321,000	2,260,000	438	11,100	1,060,000	106,000
2017:						
Canada	59,800	819,000	22	291	964	12,300
China	335	2,620	2	20	2,070	13,700
Costa Rica	--	--	21	123	317	5,870
Dominican Republic	--	--	10	131	484	662
Ecuador	--	--	--	--	650	35
France	(2)	9	5	151	139	107
Germany	7,080	11,600	2	55	64	683
Hong Kong	1,460	31,400	31	967	1,300	247
India	22	307	85	2,990	56	456
Israel	--	--	27	809	77	36
Japan	1,340	4,730	14	318	1,150	144
Korea, Republic of	148	389	6	101	747,000	24,600
Malaysia	--	--	--	--	498	8,400
Mexico	--	--	--	--	1,530	23,500
Nicaragua	--	--	--	--	452	3
Poland	--	--	--	--	41	504
Singapore	--	--	--	--	7,910	23,000
Switzerland	9,760	150,000	105	1,690	42	795
Taiwan	--	--	5	88	375	1,710
United Kingdom	34,200	17,900	28	578	26	53
Other	4	52	19	244	281	326
Total	114,000	1,040,000	382	8,550	766,000	117,000

-- Zero.

¹Table includes data available through March 27, 2019. Data are rounded to no more than three significant digits; may not add to totals shown.

²Less than ½ unit.

Source: U.S. Census Bureau.

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

(Kilograms, gold content, and thousand dollars)

Year and country or locality	Ores and concentrates ²		Dore and precipitates		Refined bullion ³		Total	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
2016	259 ^r	8,350 ^r	196,000	7,940,000	177,000	7,190,000	374,000	15,100,000
2017:								
Argentina	--	--	1,170	54,600	--	--	1,170	54,600
Aruba	--	--	12	519	--	--	12	519
Australia	--	--	8	311	142	5,460	150	5,770
Bahamas, The	--	--	5	198	--	--	5	198
Barbados	--	--	24	1,130	--	--	24	1,130
Belgium	--	--	(4)	12	7	332	7	344
Bolivia	--	--	1,800	72,900	--	--	1,800	72,900
Brazil	--	--	4,700	184,000	11,100	445,000	15,800	629,000
Canada	19	781	16,700	717,000	43,100	1,750,000	59,800	2,470,000
Chile	--	--	3,070	145,000	1,550	62,300	4,610	207,000
Colombia	--	--	21,100	839,000	3,680	145,000	24,800	984,000
Costa Rica	--	--	8	300	369	15,000	377	15,300
Curacao	--	--	2,210	87,200	2	76	2,210	87,300
Dominican Republic	--	--	1,250	49,100	(4)	7	1,250	49,100
Ecuador	1	38	3,780	150,000	--	--	3,780	150,000
France	--	--	(4)	7	388	15,200	388	15,200
Germany	--	--	28	1,150	498	20,700	526	21,800
Ghana	--	--	168	7,110	4	175	172	7,290
Greece	144	5,700	--	--	--	--	144	5,700
Guatemala	--	--	1,230	57,800	--	--	1,230	57,800
Guinea	--	--	24	940	--	--	24	940
Guyana	--	--	1,170	46,500	3,230	131,000	4,400	178,000
Honduras	--	--	1,430	59,600	1,160	46,300	2,590	106,000
Hong Kong	--	--	--	--	521	21,300	521	21,300
Ireland	178	2,600	--	--	--	--	178	2,600
Israel	--	--	--	--	19	736	19	736
Korea, Republic of	--	--	--	--	51	1,960	51	1,960
Liberia	--	--	--	--	10	315	10	315
Mexico	--	--	64,700	2,780,000	7,220	290,000	71,900	3,070,000
Nicaragua	--	--	3,810	156,000	2,230	93,400	6,040	249,000
Panama	--	--	87	3,510	468	18,500	555	22,000
Paraguay	--	--	8	315	48	1,890	56	2,210
Peru	--	--	23,200	989,000	19,600	803,000	42,800	1,790,000
South Africa	--	--	--	--	1,020	41,300	1,020	41,300
Switzerland	--	--	2,160	87,700	2,990	119,000	5,150	207,000
Trinidad and Tobago	--	--	--	--	5	195	5	195
Turkey	--	--	--	--	13	537	13	537
United Arab Emirates	--	--	40	1,620	320	12,800	360	14,500
United Kingdom	--	--	1	53	119	4,940	120	4,990
Uruguay	--	--	51	2,030	--	--	51	2,030
Venezuela	--	--	299	12,100	42	1,520	341	13,700
Other	--	--	5	209	7	271	12	481
Total	342	9,120	154,000	6,500,000	99,900	4,050,000	255,000	10,600,000

^rRevised. -- Zero.

¹Table includes data available through March 27, 2019. Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes base metal ores, concentrates, and matte destined for refining.

³Bullion also moves in both directions between U.S. markets and foreign stocks on deposit in the Federal Reserve Bank. Monetary gold is excluded.

⁴Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 7
U.S. IMPORTS OF GOLD-BEARING MATERIALS, BY COUNTRY OR LOCALITY¹

(Kilograms, gross weight, and thousand dollars)

Year and country or locality	Waste and scrap		Metal powder		Gold compounds	
	Quantity	Value	Quantity	Value	Quantity	Value
2016	23,000	464,000	260	8,970	44,400	6,210
2017:						
Antigua and Barbuda	7	151	--	--	--	--
Aruba	60	963	--	--	--	--
Bahamas, The	48	971	--	--	--	--
Barbados	31	411	--	--	--	--
Bolivia	35	865	--	--	--	--
Canada	6,970	148,000	8	334	--	--
Chile	226	5,770	--	--	--	--
China	35	672	--	--	8	34
Colombia	119	3,230	--	--	--	--
Costa Rica	1,400	34,500	2	60	--	--
Curacao	49	1,440	--	--	--	--
Dominica	11	187	--	--	--	--
Dominican Republic	940	19,200	--	--	--	--
Ecuador	101	2,120	--	--	--	--
El Salvador	374	6,170	--	--	--	--
French Polynesia	10	180	--	--	--	--
Germany	116	2,240	187	7,260	68	586
Grenada	9	173	--	--	--	--
Guatemala	497	8,200	--	--	--	--
Honduras	1,870	54,300	--	--	295	225
Italy	(2)	5	2	86	--	--
Jamaica	434	7,860	(2)	6	--	--
Japan	--	--	(2)	17	1,550	2,550
Malaysia	131	625	--	--	--	--
Martinique	10	281	--	--	--	--
Mexico	3,260	61,900	5	152	--	--
Nicaragua	510	12,900	--	--	--	--
Panama	505	10,100	--	--	--	--
Philippines	96	2,390	--	--	--	--
Portugal	85	1,820	--	--	--	--
Singapore	10	197	--	--	--	--
Spain	270	5,410	--	--	--	--
St. Vincent and the Grenadines	17	322	--	--	--	--
Switzerland	(2)	29	6	215	--	--
Trinidad and Tobago	17	277	1	12	--	--
United Kingdom	18	317	4	110	57	158
Venezuela	19	351	--	--	--	--
Other	30	543	(2)	14	--	--
Total	18,300	395,000	216	8,260	1,980	3,550

-- Zero.

¹Table includes data available through March 27, 2019. Data are rounded to no more than three significant digits; may not add to totals shown.

²Less than ½ unit.

Source: U.S. Census Bureau.

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

(Kilograms, gold content)

Country or locality ²	2013	2014	2015	2016	2017
Algeria	140	85	106 ^r	102 ^r	100 ^e
Argentina	48,966	60,162 ^r	61,310 ^r	56,998 ^r	63,000 ^e
Armenia	3,473	3,994	3,100	3,732 ^r	4,270 ^e
Australia	267,062 ^r	274,047 ^r	279,190 ^r	287,267 ^r	301,000
Azerbaijan	1,619	1,873	2,229	1,895	6,391
Bolivia	18,127	25,000 ^r	12,170 ^r	12,811	24,889
Botswana	1,205	958	756	833	920
Brazil	79,573	81,038	84,814 ^r	77,845 ^r	80,000 ^e
Bulgaria, concentrates	7,385	7,889	7,914 ^r	7,918 ^r	9,449
Burkina Faso ³	32,713	36,199 ^r	35,223 ^r	38,100 ^r	46,200
Burundi	400	650 ^r	549 ^r	396 ^r	880 ^e
Cameroon ^c	1,600	1,500	1,800	1,800	1,800
Canada	131,404 ^r	151,742 ^r	160,751 ^r	161,497 ^r	164,313
Chile	51,309	46,031	42,501	46,333 ^r	35,932
China	428,000	451,000	450,000	453,500 ^r	426,142
Colombia	55,745	57,015	59,202	61,805	52,200
Congo (Brazzaville) ^c	150	150	150	150	150
Congo (Kinshasa) ^c	17,000	31,000	37,000	37,000 ^r	37,000
Costa Rica ^c	100 ^r	100	100	100	100
Côte d'Ivoire	12,949 ^r	17,350 ^r	19,441 ^r	20,827	20,318
Cyprus	--	--	--	--	48
Denmark ⁴	100	--	--	--	--
Dominican Republic	26,084	35,081	30,454 ^r	37,933 ^r	33,910
Ecuador	8,676	7,322	7,723	6,367 ^r	7,320
Egypt	11,102	11,733	13,653	17,139	17,442
Eritrea	3,008	905	1,390	1,400 ^{r,e}	2,700 ^e
Ethiopia ⁵	12,581	11,970	9,040 ^r	8,577 ^r	11,000 ^e
Fiji	1,218 ^r	1,196 ^r	1,290 ^r	1,500 ^r	1,425
Finland	9,981	9,385	8,342	8,865	9,102
French Guiana	1,220	1,689 ^r	1,460 ^r	1,600 ^{r,e}	1,800 ^e
Gabon	1,136	1,012	1,301	1,020 ^r	1,000 ^e
Georgia ^e	4,300 ⁶	2,600	3,100	3,600	3,000
Ghana ⁷	134,060 ^r	137,090 ^r	125,325 ^r	124,196 ^r	127,573
Greece	567 ^r	503 ^r	465 ^r	109 ^r	822
Guatemala	6,386	5,928	5,641	3,826	173
Guinea	15,147	16,955	14,593 ^r	14,177 ^r	15,000 ^e
Guyana	14,964	12,053 ^r	14,029 ^r	22,168	20,334
Honduras	1,985	2,762	2,598	2,607 ^r	2,657
India	1,600 ^r	1,600 ^r	2,000 ^r	1,700 ^r	1,400
Indonesia ⁸	59,804	69,349	99,339 ^r	73,594 ^r	75,000 ^e
Iran ^{e,9}	2,500	3,300	3,500	3,700 ^r	3,700
Japan	7,411	7,115	7,700	6,455 ^r	6,372
Kazakhstan	42,552	50,339	63,614	74,737 ^r	85,029
Kenya	2,100	200	134 ^r	160	503
Korea, Republic of	413	284	269	361 ^r	24
Kyrgyzstan ^c	19,000	18,000	18,000 ^r	19,000 ^r	27,900
Laos	6,838	5,265	6,893	6,764	5,988
Liberia	587	620	883	4,704 ^r	6,369
Malaysia	3,823	4,308	4,732	2,249	2,124
Mali	41,392	39,692 ^r	40,889 ^r	41,356 ^r	46,483
Mauritania	9,513 ^r	9,625	8,804 ^r	7,127 ^r	9,096
Mexico	119,774	117,771	134,758 ^r	132,413 ^r	126,000 ^e
Mongolia	7,244	11,504 ^r	14,556 ^r	19,846 ^r	19,847
Morocco	320	212	448 ^r	352 ^r	400 ^e
Mozambique	198	197	242 ^r	2,644 ^r	2,394
Namibia	1,795 ^r	2,140 ^r	6,009 ^r	6,604 ^r	7,272
New Zealand	12,468	11,989	12,687	9,866 ^r	10,288
Nicaragua	8,612	8,648	6,814	8,391 ^r	7,377
Niger	1,150	732	1,220	999	1,000 ^e

See footnotes at end of table.

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

(Kilograms, gold content)

Country or locality ²	2013	2014	2015	2016	2017
Nigeria	-- ^r	16 ^r	5 ^r	23 ^r	20 ^e
Oman	76	165	102	67 ^r	3
Panama	2,141	2,954 ^r	2,000 ^e	400 ^{r,e}	400 ^e
Papua New Guinea	54,092	57,939	60,046	62,293	64,000 ^e
Peru	156,264	140,088 ^r	146,822 ^r	152,990 ^r	151,104
Philippines	17,248	18,423	21,314	23,053	22,699
Poland, metal	1,066	2,575	2,703	3,539	3,600 ^e
Russia	231,700	251,100 ^r	251,210	253,579 ^r	270,216
Rwanda	--	160	319	336 ^r	300 ^e
Senegal	6,445	6,588	5,670	6,874 ^r	6,732
Sierra Leone	98	43	107 ^r	188 ^r	125
Slovakia	533	582	611	490 ^{r,e}	500 ^e
Solomon Islands	1,886	1,403	--	--	--
South Africa	160,016	151,622	144,504	142,077 ^r	136,833
Spain	1,870	1,785 ^r	1,523 ^r	1,267 ^r	1,637
Sudan	70,000 ⁶	73,300 ^e	82,400 ^e	93,400 ^e	107,000 ^e
Suriname	32,300 ^r	27,900 ^r	23,900 ^r	25,500 ^r	27,300
Swaziland	--	--	--	30	30
Sweden	6,530	6,849	6,030	6,463 ^r	7,858
Tajikistan	2,774	3,477	4,200	6,987	5,500 ^e
Tanzania	42,534	40,964 ^r	43,725 ^r	45,816 ^r	43,490
Thailand	4,419	4,514	3,305	4,293	--
Togo ^{6,10}	21,086	20,583	15,568	14,000 ^{r,e}	14,000 ^e
Turkey	33,980	31,260	27,800	24,500 ^r	21,000 ^e
Uganda	3,000 ^r	3,000 ^r	3,000 ^r	3,000 ^r	1,800 ^e
United Kingdom	42	--	--	--	--
United States	230,000	210,000	214,000	228,000 ^r	237,000
Uruguay ¹¹	2,022	1,875	1,664	1,113	1,100
Uzbekistan ^e	98,000	100,000	100,000 ^r	102,000	104,000
Venezuela	1,675	1,056	558	558 ^r	480
Vietnam	1,872	164	--	35 ^r	--
Zambia	5,210	4,803 ^r	4,238 ^r	4,610 ^r	4,373
Zimbabwe	14,001	15,385	20,023	22,747 ^r	23,929
Total	2,960,000 ^r	3,050,000 ^r	3,120,000 ^r	3,180,000 ^r	3,230,000

^eEstimated. ^rRevised. -- Zero.

¹Table includes data available through November 13, 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.

²In addition to the countries and (or) localities listed, Benin, Cambodia, Central African Republic, Chad, Cuba, El Salvador, Equatorial Guinea, Haiti, Italy, Macedonia, Madagascar, Malawi, North Korea, Pakistan, Paraguay, Portugal, Saudi Arabia, and South Sudan may have produced gold (either as undocumented artisanal or byproduct production), but available information was inadequate to make reliable estimates of output.

³Does not include artisanal or byproduct production.

⁴All production is from Greenland.

⁵Production is based on the fiscal year, with a starting date of July 8 of the year shown.

⁶Reported exports.

⁷Includes artisanal and small-scale producers.

⁸Does not include production from so-called people's mines, which may be as much as 20,000 kilograms per year, but includes gold recovered as byproduct of copper mining.

⁹Includes gold recovered from the Mouteh gold mine and from the Sarcheshmeh copper complex.

¹⁰Data reported by the Government of Togo. Exports predominately include artisanal gold mine production transiting Togo from neighboring countries and to a lesser extent, domestic artisanal mine production. Data may include gold from other artisanal sources.

¹¹Production is based on the fiscal year, with a starting date of April 1 of the year shown.