



2010 Minerals Yearbook

GEMSTONES

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In 2010, the estimated value of natural gemstones produced in the United States was more than \$10.0 million, and the estimated value of U.S. laboratory-created gemstone production was more than \$30.8 million. The total estimated value of U.S. gemstone production was about \$40.8 million. The value of U.S. gemstone imports was \$19.6 billion, and the value of combined U.S. gemstone exports and reexports was estimated to be \$14.9 billion.

In this report, the terms “gem” and “gemstone” mean any mineral or organic material (such as amber, pearl, petrified wood, and shell) used for personal adornment, display, or object of art because it possesses beauty, durability, and rarity. Of more than 4,000 mineral species, only about 100 possess all these attributes and are considered to be gemstones. Silicates other than quartz are the largest group of gemstones in terms of chemical composition; oxides and quartz are the second largest (table 1). Gemstones are subdivided into diamond and colored gemstones, which in this report designates all natural nondiamond gems. In addition, laboratory-created gemstones, cultured pearls, and gemstone simulants are discussed but are treated separately from natural gemstones (table 2). Trade data in this report are from the U.S. Census Bureau. All percentages in the report were computed using unrounded data. Current information on industrial-grade diamond and industrial-grade garnet can be found in the U.S. Geological Survey (USGS) Minerals Yearbook, volume I, Metals and Minerals, chapters on industrial diamond and industrial garnet, respectively.

Gemstones have fascinated humans since prehistoric times. They have been valued as treasured objects throughout history by all societies in all parts of the world. Amber, amethyst, coral, diamond, emerald, garnet, jade, jasper, lapis lazuli, pearl, rock crystal, ruby, serpentine, and turquoise are some of the first stones known to have been used for making jewelry. These stones served as symbols of wealth and power. Today, gems are worn more for pleasure or in appreciation of their beauty than to demonstrate wealth. In addition to jewelry, gemstones are used for collections, decorative art objects, and exhibits.

Production

U.S. gemstone production data were based on a survey of more than 240 domestic gemstone producers conducted by the USGS. The survey provided a foundation for projecting the scope and level of domestic gemstone production during the year. However, the USGS survey did not represent all gemstone activity in the United States, which includes thousands of professional and amateur collectors. Consequently, the USGS supplemented its survey with estimates of domestic gemstone production from related published data, contacts with gemstone dealers and collectors, and information gathered at gem and mineral shows.

Commercial mining of gemstones has never been extensive in the United States. More than 60 varieties of gemstones have been produced commercially from domestic mines, but most of the deposits are relatively small compared with those of other mining operations. In the United States, much of the current gemstone mining is conducted by individual collectors, gem clubs, and hobbyists rather than by businesses.

The commercial gemstone industry in the United States consists of individuals and companies that mine gemstones or harvest shell and pearl, firms that manufacture laboratory-created gemstones, and individuals and companies that cut and polish natural and laboratory-created gemstones. The domestic gemstone industry is focused on the production of colored gemstones and on the cutting and polishing of large diamond stones. Industry employment is estimated to be between 1,000 and 1,200.

Most natural gemstone producers in the United States are small businesses that are widely dispersed and operate independently. The small producers probably have an average of less than three employees, including those who only work part time. The number of gemstone mines operating from year to year fluctuates because the uncertainty associated with the discovery and marketing of gem-quality minerals makes it difficult to obtain financing for developing and sustaining economically viable operations.

The total value of natural gemstones produced in the United States during 2010 was estimated to be about \$10.0 million (table 3). This production value was an 8% increase from that of 2009.

Natural gemstone materials indigenous to the United States are collected or produced in every State. During 2010, all 50 States produced at least \$1,360 worth of gemstone materials. There were 10 States that accounted for 85% of the total value, as reported by survey respondents. These States were, in descending order of production value, North Carolina, Arizona, Oregon, Utah, California, Tennessee, Montana, Colorado, Idaho, and Arkansas. Some States were known for the production of a single gemstone material—Tennessee for freshwater pearls, for example. Other States produced a variety of gemstones; for example, Arizona’s gemstone deposits included agate, amethyst, azurite, chrysocolla, garnet, jade, jasper, malachite, obsidian, onyx, opal, peridot, petrified wood, smithsonite, and turquoise. There was also a wide variety of gemstones found and produced in California, Idaho, Montana, and North Carolina.

In 2010, the United States had only one active operation in a known diamond-bearing area in Crater of Diamonds State Park near Murfreesboro in Pike County, AR. The State of Arkansas maintains a dig-for-fee operation for tourists and rockhounds at the park; Crater of Diamonds is the only diamond mine in the world that is open to the public. The diamonds occur in a

lamproite breccia tuff associated with a volcanic pipe and in the soil developed from the lamproite breccia tuff. In 2010, 601 diamond stones with an average weight of 0.218 carat were recovered at the Crater of Diamonds State Park. Of the 601 diamond stones recovered, 23 weighed more than 1 carat. Since the diamond-bearing pipe and the adjoining area became a State park in 1972, 29,906 diamond stones with a total carat weight of 5,981.1 have been recovered (Marge Jenks, park interpreter, Crater of Diamonds State Park, written commun., September 22, 2011). Exploration has demonstrated that this diamond deposit contains about 78.5 million metric tons (Mt) of diamond-bearing rock (Howard, 1999, p. 62). An Arkansas law enacted early in 1999 prohibits commercial diamond mining in the park (Diamond Registry Bulletin, 1999).

A few companies have expressed interest in exploration for diamond deposits in areas of Alaska, Colorado, Minnesota, Montana, and Wyoming with geologic settings and terrain that are similar to Canadian diamond mining areas. Even though some exploration has taken place in these States, they remain largely unexplored for diamonds (Iron Range Resources & Rehabilitation Board, 2012). Although exploration and field studies have found many diamond indicators and a number of large diamond deposits, none have attracted long-term investors or been operated commercially.

In addition to natural gemstones, laboratory-created gemstones and gemstone simulants were produced in the United States in 2010. Laboratory-created or synthetic gemstones have the same chemical, optical, and physical properties as the natural gemstones. Simulants have an appearance similar to that of a natural gemstone material, but they have different chemical, optical, and physical properties. Laboratory-created gemstones that have been produced in the United States include alexandrite, cubic zirconia, diamond, emerald, garnet, moissanite, ruby, sapphire, spinel, and turquoise. However, during 2010, only cubic zirconia, diamond, moissanite, and turquoise were produced commercially. Simulants of amber, chrysocolla, coral, lapis lazuli, malachite, travertine, and turquoise also were manufactured in the United States. In addition, certain colors of laboratory-created sapphire and spinel, used to represent other gemstones, are classified as simulants.

Laboratory-created gemstone production in the United States was valued at more than \$30.8 million during 2010, which was a 13% increase compared with that of 2009. The value of U.S. simulant gemstone output was estimated to be more than \$100 million. Five companies in five States, representing virtually the entire U.S. laboratory-created gemstone industry, reported production to the USGS. The States with reported laboratory-created gemstone production were, in descending order of production value, Florida, New York, Massachusetts, North Carolina, and Arizona.

Since the 1950s, when scientists manufactured the first laboratory-created bits of diamond grit using a high-pressure, high-temperature (HPHT) method, this method of growing diamonds has become relatively commonplace in the world as a technology for laboratory-created diamonds, so much so that thousands of small plants throughout China were using the HPHT method and producing laboratory-created diamonds

suitable for cutting as gemstones. Gem-quality diamonds of 1 carat or more are harder to manufacture because at that size, it is difficult to consistently produce diamonds of high quality, even in the controlled environment of a laboratory using the HPHT method. After more than 50 years of development, that situation has changed, and several laboratory-created diamond companies were producing high-quality diamonds that equal those produced from mines (Park, 2007).

Gemesis Corp. (Sarasota, FL) consistently produced gem-quality laboratory-created diamond and reported an 11th year of production in 2010. The laboratory-created diamonds are produced using equipment, expertise, and technology developed by a team of scientists from Russia and the University of Florida. The weight of the laboratory-created diamond stones ranges from 1½ to 2 carats, and most of the stones are brownish yellow, colorless, green, and yellow. Gemesis uses diamond-growing machines, each machine capable of growing 3-carat rough diamonds by generating HPHT conditions that recreate the conditions in the Earth's mantle where natural diamonds form (Davis, 2003). Gemesis could be producing as many as 30,000 to 40,000 stones each year, and annual revenues may reach \$70 million to \$80 million. Gemesis diamonds are available for retail purchase in jewelry stores and on the Internet, and the prices of the Gemesis laboratory-created diamonds are 30% to 50% lower than those of comparable natural diamond but above the prices of simulated diamond (Gemesis Corp., 2010).

In the early 2000s, Apollo Diamond, Inc., near Boston, MA, developed and patented a method for growing single, extremely pure, gem-quality diamond crystals by chemical vapor deposition (CVD). The CVD technique transforms carbon into plasma, which is then precipitated onto a substrate as diamond. CVD had been used for more than a decade to cover large surfaces with microscopic diamond crystals, but in developing this process, Apollo Diamond discovered the temperature, gas composition, and pressure combination that resulted in the growth of a single diamond crystal. These CVD diamonds may not be distinguishable from natural diamond by some tests (Davis, 2003). Apollo Diamond produced laboratory-created stones that ranged from 1 to 2 carats. Growth of CVD diamonds is limited only by the size of the seed placed in the diamond-growing chamber. In 2008, the company increased its production of large stones and sold the diamonds at prices that averaged 15% less than those of comparable natural diamonds on the company Web site and through select jewelers (Apollo Diamond, Inc., 2008). Both Apollo Diamond and Gemesis prefer to call their diamonds "cultured" rather than laboratory-created, referring to the fact that the diamonds are grown much like a cultured pearl is grown.

In 2010, Charles & Colvard, Ltd. in North Carolina entered its 13th year as the world's only manufacturer of moissanite, a gem-quality laboratory-created silicon carbide. Moissanite is also an excellent diamond simulant, but it is being marketed for its own gem qualities. Moissanite exhibits a higher refractive index (brilliance) and higher luster than diamond. Its hardness is between those of corundum (ruby and sapphire) and diamond, which gives it durability (Charles & Colvard, Ltd., 2010). Charles & Colvard reported that moissanite sales increased by 53% to \$12.7 million in 2010 compared with \$8.3 million in 2009 (Charles & Colvard, Ltd., 2011).

U.S. mussel shells are used as a source of mother-of-pearl and as seed material for culturing pearls. U.S. shell production increased by 15% in 2010 compared with that of 2009 as were a reflection of the recovery from the impacts of the global recession on luxury spending. This increase was in spite of decreased demands for U.S. shell materials caused by the use of manmade seed materials and seed materials from China and other sources by pearl producers in Japan. The popularity of darker and colored pearls and freshwater pearls that do not use U.S. seed material has also contributed decreased demands for U.S. shell materials. In some regions of the United States, shell from mussels was being used more as a gemstone based on its own merit rather than as seed material for pearls. This shell material was being processed into mother-of-pearl and used in beads, jewelry, and watch faces.

Consumption

Historically, diamond gemstones have proven to hold their value despite wars or economic depressions, but this did not hold true during the recent worldwide economic recession. Diamond and colored gemstones value and sales decreased during the economic downturn in 2008 and continued into 2009, but during 2010 U.S. gemstone consumption and sales increased.

Although the United States accounted for little of the total global gemstone production, it was the world's leading diamond and nondiamond gemstone market. It was estimated that U.S. gemstone markets accounted for more than 35% of world gemstone demand in 2010. The U.S. market for unset gem-quality diamond during the year was estimated to be about \$18.6 billion, an increase of 46% compared with that of 2009. Domestic markets for natural, unset nondiamond gemstones totaled approximately \$959 million in 2010, which was a 23% increase from that of 2009. These large increases in domestic markets were a reflection of the recovery from the impacts of the global recession on luxury spending.

In the United States, a majority of domestic consumers designate diamond as their favorite gemstone. This popularity of diamonds is evidenced by the U.S. diamond market making up 95% of the total U.S. gemstone market. Colored natural gemstones, colored laboratory-created gemstones, and "fancy" colored diamonds were popular in 2010, with the values of the domestic markets for almost all types of colored natural, unset nondiamond gemstones increased from the 2009 values (table 10), also owing to recovery from the impact of the recession on luxury spending.

The estimated U.S. retail jewelry sales were \$63.4 billion in 2010, an increase of 7.7% from sales of \$58.8 billion in 2009 (Gassman, 2011). Twenty-five percent of all U.S. jewelers reported jewelry sales increased 20% or more from that of the previous year during the 2010 holiday shopping season (Graff, 2011).

Prices

Gemstone prices are governed by many factors and qualitative characteristics, including beauty, clarity, defects, demand, durability, and rarity. Diamond pricing, in particular, is complex;

values can vary significantly depending on time, place, and the subjective valuations of buyers and sellers. There are more than 14,000 categories used to assess rough diamond and more than 100,000 different combinations of carat, clarity, color, and cut values used to assess polished diamond.

Colored gemstone prices are generally influenced by market supply and demand considerations, and diamond prices are supported by producer controls on the quantity and quality of supply. Values and prices of gemstones produced and (or) sold in the United States are listed in tables 3 through 5. In addition, customs values for diamonds and other gemstones imported, exported, or reexported are listed in tables 6 through 10.

De Beers Group companies remain a significant force, influencing the price of gem-quality diamond sales worldwide during 2010 because the companies mine a significant portion of the world's gem-quality diamond produced each year. In 2010, De Beers produced 33 million carats from its independently owned and joint-venture operations in Botswana, Canada, Namibia, and South Africa. De Beers companies also sorted and valued a large portion (by value) of the world's annual supply of rough diamond through De Beers' subsidiary Diamond Trading Co. (DTC). DTC sales of rough diamonds totaled \$5.08 billion during 2010—up \$1.85 billion from 2009. DTC rough diamond average prices increased by 27% from those of 2009. In 2010, De Beers had diamond sales of \$5.88 billion, which was an increase of 53% from diamond sales of 2009. These increases were driven by strong demand in Chinese and Indian markets (Lee, 2011).

Foreign Trade

During 2010, total U.S. gemstone trade with all countries and territories was valued at about \$34.5 billion, which was a increase of 43% from that of 2009. Diamond accounted for about 95% of the 2010 gemstone trade total. In 2010, U.S. exports and reexports of diamond were shipped to 95 countries and territories, and imports of all gemstones were received from 99 countries and territories (tables 6–10). In 2010, U.S. import quantities in cut diamond increased by 24% compared with those of 2009, and their value increased by 45%. U.S. import quantities in rough and unworked diamond decreased by 44%, although their value increased by 81% (table 7). The United States remained the world's leading diamond importer and was a significant international diamond transit center as well as the world's leading gem-quality diamond market. In 2010, U.S. export quantities of gem-grade diamond increased by 80% compared with those of 2009, and their value increased by 33%. The large volume of reexports revealed the significance that the United States had in the world's diamond supply network (table 6). These increases in trade were owing to recovery from the impact of the recession on luxury spending.

Import values of laboratory-created gemstone increased by 10% for the United States in 2010 compared with those of 2009 (table 10). Again, this increase in imports was owing to recovery from the impact of the recession on luxury spending.

Laboratory-created gemstone imports from Austria, China, Germany, Hong Kong, India, Switzerland, and Thailand, with more than \$500,000 in imports each, made up about 91% (by value) of the total domestic imports of laboratory-created

gemstones during the year (table 9). The marketing of imported laboratory-created gemstones and enhanced gemstones as natural gemstones, and the mixing of laboratory-created materials with natural stones in imported parcels, continued to be problems for some domestic producers in 2009. There also were continuing problems with some simulants being marketed as laboratory-created gemstones during the year.

World Review

The gemstone industry worldwide has two distinct sectors—diamond mining and marketing and colored gemstone production and sales. Most diamond supplies are controlled by a few major mining companies; prices are supported by managing the quality and quantity of the gemstones relative to demand, a function performed by De Beers through DTC. Unlike diamond, colored gemstones are primarily produced at relatively small, low-cost operations with few dominant producers; prices are influenced by consumer demand and supply availability.

In 2010, world natural diamond production totaled about 144 million carats—79.9 million carats gem quality and 63.8 million carats industrial grade (table 11). Most production was concentrated in a few regions—Africa [Angola, Botswana, Congo (Kinshasa), Namibia, and South Africa], Asia (northeastern Siberia and Yakutia in Russia), Australia, North America (Northwest Territories in Canada), and South America (Brazil and Venezuela). In 2010, Russia led the world in total natural diamond output quantity (combined gemstone and industrial) with 23% of the world estimated production. Botswana was the world's leading gemstone diamond producer with 31%; followed by Russia, 22%; Angola, 16%; Canada, 15%; Congo (Kinshasa), 7%; South Africa, 4%; Namibia, 2%; and Guinea, 1%. These eight countries produced 97% (by quantity) of the world's gemstone diamond output in 2010.

In 2002, the international rough-diamond certification system, the Kimberley Process Certification Scheme (KPCS), was agreed upon by United Nations (UN) member nations, the diamond industry, and involved nongovernmental organizations to prevent the shipment and sale of conflict diamonds. Conflict diamonds are diamonds that originate from areas controlled by forces or factions opposed to legitimate and internationally recognized governments, and are used to fund military action in opposition to those governments, or in contravention of the decisions of the UN Security Council. The KPCS includes the following key elements: the use of forgery-resistant certificates and tamper-proof containers for shipments of rough diamonds; internal controls and procedures that provide credible assurance that conflict diamonds do not enter the legitimate diamond market; a certification process for all exports of rough diamonds; the gathering, organizing, and sharing of import and export data on rough diamonds with other participants of relevant production; credible monitoring and oversight of the international certification scheme for rough diamonds; effective enforcement of the provisions of the certification scheme through dissuasive and proportional penalties for violations; self regulation by the diamond industry that fulfills minimum requirements; and sharing information with all other participants on relevant rules, procedures, and legislation as well as examples of national certificates used to accompany

shipments of rough diamonds. Israel assumed the chair of KPCS for January 1 through December 31, 2010, the eighth country or organization in succession to hold the chair after Namibia, India, South Africa, Canada, Russia, Botswana, and the European Commission. The 50 participants represented 76 nations (including the 27 member nations of the European Community) plus the rough diamond-trading entity of Taipei. During 2010, Côte d'Ivoire continued to be under UN sanctions and was not trading in rough diamonds, and Venezuela voluntarily suspended exports and imports of rough diamonds until further notice. The participating nations in the KPCS account for approximately 99.8% of the global production and trade of rough diamonds (Kimberley Process, undated).

Globally, the value of production of natural gemstones other than diamond was estimated to be more than \$2.5 billion in 2010. Most nondiamond gemstone mines are small, low-cost, and widely dispersed operations in remote regions of developing nations. Foreign countries with major gemstone deposits other than diamond are Afghanistan (aquamarine, beryl, emerald, kunzite, lapis lazuli, ruby, and tourmaline), Australia (beryl, opal, and sapphire), Brazil (agate, amethyst, beryl, ruby, sapphire, topaz, and tourmaline), Burma (beryl, jade, ruby, sapphire, and topaz), Colombia (beryl, emerald, and sapphire), Kenya (beryl, garnet, and sapphire), Madagascar (beryl, rose quartz, sapphire, and tourmaline), Mexico (agate, opal, and topaz), Sri Lanka (beryl, ruby, sapphire, and topaz), Tanzania (garnet, ruby, sapphire, tanzanite, and tourmaline), and Zambia (amethyst and beryl). In addition, pearls are cultured throughout the South Pacific and in other equatorial waters; Australia, China, French Polynesia, and Japan were key producers in 2010.

Worldwide diamond exploration allocations decreased by 9% in 2010, to \$357 million spent by 99 companies compared with \$393 million by 113 companies during 2009. This lowered the diamond share of overall worldwide mineral exploration spending to 3% during 2010. Planned diamond exploration spending in 2010 was at its lowest value since 2003. Africa was the most popular diamond exploration location for the seventh year in a row, although Africa's share of overall exploration spending decreased to 35% in 2010 from almost 50% in 2009. Canada's share of total diamond exploration budgets increased to 29% in 2010 from 18% in 2009. De Beers Group dropped from the position of top diamond explorer that it had held for more than a decade and was replaced by ALROSA Co. Ltd. ALROSA, De Beers Group, and Rio Tinto plc were the three leading diamond exploration companies, accounting for 57% of the estimated \$357 million total global diamond exploration budget in 2010 (Metals Economics Group, 2010, p. 8–9; 2011, p. 13).

Worldwide in 2010, diamond prices recovered strongly from the downturn caused by the global recession. The recovery was led by an upturn in the U.S. markets; this was demonstrated by increasing quantity and value of diamond imports in 2010 and improved sales in North America overall (Metals Economics Group, 2011, p. 10).

Worldwide in 2010, three diamond mines started up, including one mine reopening. One of the startups was in Botswana, one in Brazil, and the reopening was in South Africa (Metals Economics Group, 2011, p. 15).

Botswana.—Firestone Diamonds plc received a license for mining the BK11 Mine in July 2010, and began operating phase I of the production plant. Work on phase 2 was completed in the third quarter of 2010, increasing the ore production rate to 1.5 million metric tons (Mt) per year. The mine reached full production of 150,000 carats per year in the fourth quarter of 2010. The BK11 Mine is an open pit operation, which is 90% owned by Firestone Diamonds plc and 10% by a local company. Firestone estimated the BK11 Mine's reserves to be 18.0 Mt at startup (Metals Economics Group, 2011, p. 15).

Brazil.—During the third quarter of 2010, Vaaldiam Mining Inc. started production at its Duas Barras alluvial mining operation. Diamond recovery during the quarter was 643 carats from ore grading 0.03 carat per cubic meter. The ore grade improved after September with the opening of a second mining front that exposed large amounts of better quality gravels. The recovered diamond grade was approximately 0.16 carat per cubic meter. Vaaldiam estimated the reserves for Duas Barras at 2.3 Mt (Metals Economics Group, 2011, p. 15).

Canada.—Canadian diamond production was about 11.8 million carats (Mct) during 2010, an increase of about 8% compared with that of 2009. Diamond exploration continued in Canada, with several commercial diamond projects and additional discoveries in Alberta, British Columbia, the Northwest Territories, the Nunavut Territory, Ontario, and Quebec. In 2010, Canada produced 8.2% of the world's combined natural gemstone and industrial diamond output.

The Diavik Diamond Mine in the Northwest Territories completed its eighth full year of production. In 2010, Diavik produced 6.5 Mct of diamond, an increase of 16% from the previous year's production. At yearend 2010, Diavik estimated the mine's remaining proven and probable reserves to be 18 Mt of ore in kimberlite pipes containing 52.2 Mct of diamond and projected the total mine life to be 16 to 22 years. Diavik began developing an underground mine and substantially completed construction on the project during 2009, and the first ore was produced during the first quarter of 2010, with full production expected in 2013. The mine is an unincorporated joint venture between Diavik Diamond Mine Inc. (60%) and Harry Winston Diamond Mines Ltd. (40%) (Diavik Diamond Mine Inc., 2011; Perron, 2011, p. 2).

The Ekati Diamond Mine completed its twelfth full year of production in 2010. Ekati produced 2.89 Mct of diamond from 4.85 Mt of ore. BHP Billiton Ltd. has an 80% controlling ownership in Ekati, which also is in the Northwest Territories. Ekati has estimated remaining reserves of 38.5 Mt of ore in kimberlite pipes that contain 18.3 Mct of diamond. BHP Billiton projected the remaining mine life to be 12 years. Approximately 21% of the Ekati 2010 production is industrial-grade diamond (BHP Billiton Ltd., 2011, p. 10; Perron, 2011, p. 1).

The Jericho Diamond Mine is in Nunavut and was originally owned by Tahera Diamond Corp. Tahera estimated Jericho Diamond Mine's reserves to be about 5.5 Mt of ore grading 0.85 carat per ton. In 2008, the Jericho Diamond Mine experienced startup problems related to ore mining and processing. The mine also suffered financial problems owing to the cost of transporting supplies to the mine site, high operational costs, high oil prices, and appreciation of the

Canadian dollar versus the U.S. dollar. All of these problems combined to force the company to enter into protection under Canada's "Companies' Creditors Arrangement Act" on January 16, 2008, and the mine suspended production on February 6, 2008. At yearend 2009, Tahera was finalizing arrangements to sell all of its Jericho Mine assets (Perron, 2011, p. 2). In July 2010, Shear Minerals Ltd. (now known as Shear Diamonds Ltd.) announced that it had entered into a purchase agreement with Tahera and Benachee Resources Inc. to acquire a 100% interest in the Jericho Diamond Mine, the mine's processing facilities, and all supporting exploration assets in the Kitikmeot region of Nunavut (Shear Minerals Ltd., 2010). Shear Minerals completed the acquisition of the Jericho Diamond Mine in August 2010 with the intention of bringing the mine back into production (Shear Minerals Ltd., 2011).

The Snap Lake Mine, which is wholly owned by De Beers Canada Inc., is in the Northwest Territories. The Snap Lake deposit is a tabular-shaped kimberlite dyke rather than the typical kimberlite pipe. The dyke is 2.5 meters thick and dips at an angle of 12° to 15°. The deposit was mined using a modified room and pillar underground mining method in 2010. The Snap Lake Mine started mining operations in October 2007, reached commercial production levels in the first quarter of 2008, and officially opened on June 25, 2008. The mine was expected to produce 1.4 Mct per year of diamond, and the mine life was expected to be about 20 years. The mine's production for 2010 was 926,000 carats for a recovered grade of 1.2 carats per metric ton (De Beers Canada Inc., 2011; Perron, 2011, p. 2–3).

The Victor Mine, which also is wholly owned by De Beers Canada, is in northern Ontario on the James Bay coast. The Victor kimberlite consists of two pipes with surface area of 15 hectares (37.1 acres). The Victor Mine initiated mining operations at yearend 2007 and was officially opened on July 26, 2008. The Victor Mine reportedly has 27.4 Mt of ore with average ore grade of 0.23 carat per metric ton estimated minable reserves. At full capacity, the open pit mine was expected to produce 600,000 carats per year, and the mine life was expected to be about 12 years. In 2010, the mine's production was 826,000 carats recovered from 2.67 Mt of ore (De Beers Canada Inc., undated; Perron, 2011, p. 3).

South Africa.—Petra Diamonds Ltd. has operated the Kimberley Underground Mines under care-and-maintenance status since 2007. De Beers had closed the mines in August 2005. In September 2007, Petra Diamonds began the process of purchasing De Beers interests in the mines and began rehabilitating the deep underground diamond mines. Petra Diamonds purchased the Kimberley diamond operations from De Beers for \$11 million, and Petra Diamonds was given approval to operate the mines under De Beers' licence. After completing the mine rehabilitation, Petra Diamonds reopened the underground mine in September 2010. Petra had been producing from tailings and stockpile for the previous few years. During the fourth quarter of 2010, Kimberley produced 25,000 carats grading 0.14 carat per metric ton, and sold 17,300 carats at an average price of \$285 per carat. The Kimberley Mines are 74% owned by Petra Diamonds and 26% by Sedibeng Mining (Pty) Ltd. Petra Diamonds estimated the Kimberley Mine's reserves to be 57.0 Mt. Kimberley's annual production was expected to be 100,000 carats

from the processing of 1 Mt per year of ore (Metals Economics Group, 2011, p. 15; Petra Diamonds Ltd., undated).

Outlook

As the domestic and global economy improves, Internet sales of diamonds, gemstones, and jewelry were expected to continue to expand and increase in popularity, as were other forms of e-commerce that emerge to serve the diamond and gemstone industry. Internet sales are expected to add to and partially replace “brick-and-mortar” sales. This is likely to take place as the gemstone industry and its customers become more comfortable with and learn the applications of new e-commerce tools, such as sales Web sites and online social networking Web sites (Dayrit, 2011).

As more independent producers, such as Ekati and Diavik in Canada, come online they will bring a greater measure of competition to global markets that presumably will bring more supplies and lower prices. Further consolidation of diamond producers and larger quantities of rough diamond being sold outside DTC is expected to continue as the diamond industry adjusts to De Beers’ reduced influence on the industry.

More laboratory-created gemstones, simulants, and treated gemstones are likely to enter the marketplace and necessitate more transparent trade industry standards to maintain customer confidence.

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TABLE 1
GUIDE TO SELECTED GEMSTONES AND GEM MATERIALS USED IN JEWELRY

| Name | Composition | Color | Practical size ¹ | Cost ² | Mohs | Specific gravity | Refraction | Refractive index | May be confused with | Recognition characteristics |
|--------------------|---|--|-----------------------------|-------------------|---------|------------------|-----------------|------------------|--|---|
| Amber | Hydrocarbon | Yellow, red, green, blue | Any | Low to medium | 2.0–2.5 | 1.0–1.1 | Single | 1.54 | Synthetic or pressed plastics, kaurigum | Fossil resin, color, low density, soft, insects. |
| Apatite | Chlorocalcium phosphate | Colorless, pink, yellow, green, blue, violet | Small | Low | 5.0 | 3.16–3.23 | Double | 1.63–1.65 | Amblygonite, andalusite, brazilianite, precious beryl, titanite, topaz, tourmaline | Crystal habit, color, hardness, appearance. |
| Azurite | Copper carbonate hydroxide | Azure, dark blue, pale blue | Small to medium | do. | 3.5–4.0 | 3.7–3.9 | do. | 1.72–1.85 | Dumortierite, haunynite, lapis lazuli, lazulite, sodalite | Color, softness, crystal habits, associated minerals. |
| Benitoite | Barium titanium silicate | Blue, purple, pink, colorless | do. | High | 6.0–6.5 | 3.64–3.68 | do. | 1.76–1.80 | Sapphire, tanzanite, blue diamond, blue tourmaline, cordierite | Strong blue in ultraviolet light. |
| Beryl: | | | | | | | | | | |
| Aquamarine | Beryllium aluminum silicate | Blue-green to light blue | Any | Medium to high | 7.5–8.0 | 2.63–2.80 | do. | 1.58 | Synthetic spinel, blue topaz | Double refraction, refractive index. |
| Bixbite | do. | Red | Small | Very high | 7.5–8.0 | 2.63–2.80 | do. | 1.58 | Pressed plastics, tourmaline | Refractive index. |
| Emerald, natural | do. | Green | Medium | do. | 7.5 | 2.63–2.80 | do. | 1.58 | Fused emerald, glass, tourmaline, peridot, green garnet doublets | Emerald filter, dichroism, refractive index. |
| Emerald, synthetic | do. | do. | Small | High | 7.5–8.0 | 2.63–2.80 | do. | 1.58 | Genuine emerald | Lack of flaws, brilliant fluorescence in ultraviolet light. |
| Golden (heliodor) | do. | Yellow to golden | Any | Low to medium | 7.5–8.0 | 2.63–2.80 | do. | 1.58 | Citrine, topaz, glass, doublets | Weak-colored. |
| Goshenite | do. | Colorless | do. | Low | 7.5–8.0 | 2.63–2.80 | do. | 1.58 | Quartz, glass, white sapphire, white topaz | Refractive index. |
| Morganite | do. | Pink to rose | do. | do. | 7.5–8.0 | 2.63–2.80 | do. | 1.58 | Kunzite, tourmaline, pink sapphire | Do. |
| Calcite: | | | | | | | | | | |
| Marble | Calcium carbonate | White, pink, red, blue, green, or brown | do. | do. | 3.0 | 2.72 | Double (strong) | 1.49–1.66 | Silicates, banded agate, alabaster gypsum | Translucent. |
| Mexican onyx | do. | do. | do. | do. | 3.0 | 2.72 | do. | 1.6 | do. | Banded, translucent. |
| Charoite | Hydrated sodium calcium hydroxide-fluoro-silicate | Lilac, violet, or white | Small to medium | do. | 5.0–6.0 | 2.54–2.78 | XX | 1.55–1.56 | Purple marble | Color, locality. |

See footnotes at end of table.

TABLE 1—Continued
GUIDE TO SELECTED GEMSTONES AND GEM MATERIALS USED IN JEWELRY

| Name | Composition | Color | Practical size ¹ | Cost ² | Mohs | Specific gravity | Refraction | Refractive index | May be confused with | Recognition characteristics |
|--------------------------------|---------------------------------|---|-----------------------------|-------------------|----------|------------------|------------|------------------|---|--|
| Chrysoberyl: | | | | | | | | | | |
| Alexandrite | Beryllium aluminate | Green by direct sunlight, or encandescant light, red by indirect sunlight or fluorescent light | Small to medium | High | 8.5 | 3.50–3.84 | Double | 1.75 | Synthetic | Strong dichroism, color varies from red to green, hardness. |
| Cat's eye | do. | Greenish to brownish | do. | do. | 8.5 | 3.50–3.84 | do. | 1.75 | Synthetic, shell | Density, translucence, chatoyance. |
| Chrysolite | do. | Yellow, green, and (or) brown | Medium | Medium | 8.5 | 3.50–3.84 | do. | 1.75 | Tourmaline, peridot | Refractive index, silky. |
| Chrysocolla | Hydrated copper silicate | Green, blue | Any | Low | 2.0–4.0 | 2.0–2.4 | XX | 1.46–1.57 | Azurite, dyed chalcedony, malachite, turquoise, variscite | Lack of crystals, color, fracture, low density, softness. |
| Coral | Calcium carbonate | Orange, red, white, black, purple, or green | Branching, medium | do. | 3.5–4.0 | 2.6–2.7 | Double | 1.49–1.66 | False coral | Dull translucent. |
| Corundum: | | | | | | | | | | |
| Ruby | Aluminum oxide | Rose to deep purplish red | Small | Very high | 9.0 | 3.95–4.10 | do. | 1.78 | Synthetics, including spinel, garnet | Inclusions, fluorescence. |
| Sapphire, blue | do. | Blue | Medium | High | 9.0 | 3.95–4.10 | do. | 1.78 | do. | Inclusions, double refraction, dichroism. |
| Sapphire, fancy | do. | Yellow, pink, colorless, orange, green, or violet | Medium to large | Medium | 9.0 | 3.95–4.10 | do. | 1.78 | Synthetics, glass and doublets, morganite | Inclusions, double refraction, refractive index. |
| Sapphire or ruby, stars | do. | Red, pink, violet, blue, or gray | do. | High to low | 9.0 | 3.95–4.10 | do. | 1.78 | Star quartz, synthetic stars | Shows asterism, color side view. |
| Sapphire or ruby, synthetic | do. | Yellow, pink, blue, green, orange, violet, or red | Up to 20 carats | Low | 9.0 | 3.95–4.10 | do. | 1.78 | Synthetic spinel, glass | Curved striae, bubble inclusions. |
| Cubic zirconia | Zirconium and yttrium oxides | Colorless, pink, blue, lavender, yellow | Small | do. | 8.25–8.5 | 5.8 | Single | 2.17 | Diamond, zircon, titania, moissanite | Hardness, density, lack of flaws and inclusions, refractive index. |
| Diamond | Carbon | White, blue-white, yellow, brown, green, red, pink, blue | Any | Very high | 10.0 | 3.516–3.525 | do. | 2.42 | Zircon, titania, cubic zirconia, moissanite | High index, dispersion, hardness, luster. |
| Feldspar: | | | | | | | | | | |
| Amazonite | Alkali aluminum silicate | Green-blue | Large | Low | 6.0–6.5 | 2.56 | XX | 1.52 | Jade, turquoise | Cleavage, sheen, vitreous to pearly, opaque, grid. |
| Labradorite | do. | Gray with blue and bronze sheen color play (schiller) | do. | do. | 6.0–6.5 | 2.56 | XX | 1.56 | do. | Do. |

See footnotes at end of table.

TABLE 1—Continued
GUIDE TO SELECTED GEMSTONES AND GEM MATERIALS USED IN JEWELRY

| Name | Composition | Color | Practical size ¹ | Cost ² | Mohs | Specific gravity | Refraction | Refractive index | May be confused with | Recognition characteristics |
|---------------------|--------------------------------------|--|-----------------------------|-------------------|---------|------------------|--------------------|------------------|---|--|
| Feldspar—Continued: | | | | | | | | | | |
| Moonstone | Alkali aluminum silicate | Colorless, white, gray, or yellow with white, blue, or bronze schiller | Large | Low | 6.0–6.5 | 2.77 | XX | 1.52–1.54 | Glass, chalcedony, opal | Pale sheen, opalescent. |
| Sunstone | do. | Orange, red brown, colorless with gold or red glittery schiller | Small to medium | do. | 6.0–6.5 | 2.77 | XX | 1.53–1.55 | Aventurine, glass | Red glittery schiller. |
| Garnet | Complex silicate | Brown, black, yellow, green, red, or orange | do. | Low to high | 6.5–7.5 | 3.15–4.30 | Single strained | 1.79–1.98 | Synthetics, spinel, glass | Single refraction, anomalous strain. |
| Hematite | Iron oxide | Black, black-gray, brown-red | Medium to large | Low | 5.5–6.5 | 5.12–5.28 | XX | 2.94–3.22 | Davidite, cassiterite, magnetite, neptunite, pyrolusite, wolframite | Crystal habit, streak, hardness. |
| Jade: | | | | | | | | | | |
| Jadeite | Complex silicate | Green, yellow, black, white, or mauve | Large | Low to very high | 6.5–7.0 | 3.3–3.5 | Crypto-crystalline | 1.65–1.68 | Nephrite, chalcedony, onyx, bowenite, vesuvianite, grossularite | Luster, spectrum, translucent to opaque. |
| Nephrite | Complex hydrous silicate | Green, yellow, black, white, or mauve | do. | Low to very high | 6.0–6.5 | 2.96–3.10 | do. | 1.61–1.63 | Jadeite, chalcedony, onyx, bowenite, vesuvianite, grossularite | Do. |
| Jet (gagate) | Lignite | Deep black, dark brown | do. | Low | 2.5–4.0 | 1.19–1.35 | XX | 1.64–1.68 | Anthracite, asphalt, cannel coal, onyx, schorl, glass, rubber | Luster, color. |
| Lapis lazuli | Sodium calcium aluminum silicate | Dark azure-blue to bright indigo blue or even a pale sky blue. | do. | do. | 5.0–6.0 | 2.50–3.0 | XX | 1.5 | Azurite, dumortierite, dyed howlite, lazulite, sodalite, glass | Color, crystal habit, associated minerals, luster, localities. |
| Malachite | Hydrated copper carbonate | Light to black-green banded | do. | do. | 3.5–4.0 | 3.25–4.10 | XX | 1.66–1.91 | Brochantite, chrysoprase, opaque green gemstones | Color banding, softness, associated minerals. |
| Moissanite | Silicon carbide | Colorless and pale shades of green, blue, yellow | Small | Low to medium | 9.25 | 3.21 | Double | 2.65–2.69 | Diamond, zircon, titania, cubic zirconia | Hardness, dispersion, lack of flaws and inclusions, refractive index. |
| Obsidian | Amorphous, variable (usually felsic) | Black, gray, brown, dark green, white, transparent | Large | Low | 5.0–5.5 | 2.35–2.60 | XX | 1.45–1.55 | Aegirine-augite, gadolinite, gagate, hematite, pyrolusite, wolframite | Color, conchoidal fracture, flow bubbles, softness, lack of crystal faces. |

See footnotes at end of table.

TABLE 1—Continued
GUIDE TO SELECTED GEMSTONES AND GEM MATERIALS USED IN JEWELRY

| Name | Composition | Color | Practical size ¹ | Cost ² | Mohs | Specific gravity | Refraction | Refractive index | May be confused with | Recognition characteristics |
|-------------|-------------------------|---|-----------------------------|-------------------|---------|------------------|-----------------|------------------|--|---|
| Opal | Hydrated silica | Reddish orange, colors flash in white gray, black, red, or yellow | Large | Low to high | 5.5–6.5 | 1.9–2.3 | Single | 1.45 | Glass, synthetics, triplets, chalcedony | Color play (opalescence). |
| Peridot | Iron magnesium silicate | Yellow and or green | Any | Medium | 6.5–7.0 | 3.27–3.37 | Double (strong) | 1.65–1.69 | Tourmaline, chrysoberyl | Strong double refraction, low dichroism. |
| Quartz: | | | | | | | | | | |
| Agate | Silicon dioxide | Any | Large | Low | 7.0 | 2.58–2.64 | XX | XX | Glass, plastic, Mexican onyx | Cryptocrystalline, irregularly banded, dendritic inclusions. |
| Amethyst | do. | Purple | do. | Medium | 7.0 | 2.65–2.66 | Double | 1.55 | Glass, plastic, fluorite | Macrocrystalline, color, refractive index, transparent, hardness. |
| Aventurine | do. | Green, red-brown, gold-brown, with metallic iridescent reflection | do. | Low | 7.0 | 2.64–2.69 | do. | 1.54–1.55 | Iridescent analcime, aventurine feldspar, emerald, aventurine glass | Macrocrystalline, color, metallic iridescent flake reflections, hardness. |
| Cairngorm | do. | Smoky orange or yellow | do. | do. | 7.0 | 2.65–2.66 | do. | 1.55 | do. | Macrocrystalline, color, refractive index, transparent, hardness. |
| Carnelian | do. | Flesh red to brown red | do. | do. | 6.5–7.0 | 2.58–2.64 | do. | 1.53–1.54 | Jasper | Cryptocrystalline, color, hardness. |
| Chalcedony | do. | Bluish, white, gray | do. | do. | 6.5–7.0 | 2.58–2.64 | do. | 1.53–1.54 | Tanzanite | Do. |
| Chrysoprase | do. | Green, apple-green | do. | do. | 6.5–7.0 | 2.58–2.64 | Double | 1.53–1.54 | Chrome chalcedony, jade, prase opal, prehnite, smithsonite, variscite, artificially colored green chalcedony | Do. |
| Citrine | do. | Yellow | do. | do. | 7.0 | 2.65–2.66 | do. | 1.55 | do. | Macrocrystalline, color, refractive index, transparent, hardness. |
| Jasper | do. | Any, striped, spotted, or sometimes uniform | do. | do. | 7.0 | 2.58–2.66 | XX | XX | do. | Cryptocrystalline, opaque, vitreous luster, hardness. |
| Onyx | do. | Many colors | do. | do. | 7.0 | 2.58–2.64 | XX | XX | do. | Cryptocrystalline, uniformly banded, hardness. |

See footnotes at end of table.

TABLE 1—Continued
GUIDE TO SELECTED GEMSTONES AND GEM MATERIALS USED IN JEWELRY

| Name | Composition | Color | Practical size ¹ | Cost ² | Mohs | Specific gravity | Refraction | Refractive index | May be confused with | Recognition characteristics |
|-------------------|---------------------------------|---|-----------------------------|-------------------|---------|------------------|------------|------------------|--|--|
| Quartz—Continued: | | | | | | | | | | |
| Petrified wood | Silicon dioxide | Brown, gray, red, yellow | Large | Low | 6.5–7.0 | 2.58–2.91 | Double | 1.54 | Agate, jasper | Color, hardness, wood grain. |
| Rock crystal | do. | Colorless | do. | do. | 7.0 | 2.65–2.66 | do. | 1.55 | Topaz, colorless sapphire | Do. |
| Rose | do. | Pink, rose red | do. | do. | 7.0 | 2.65–2.66 | do. | 1.55 | do. | Macrocrystalline, color, refractive index, transparent, hardness. |
| Tiger's eye | do. | Golden yellow, brown, red, blue-black | do. | do. | 6.5–7.0 | 2.58–2.64 | XX | 1.53–1.54 | XX | Macrocrystalline, color, hardness, chatoyancy. |
| Rhodochrosite | Manganese carbonate | Rose-red to yellowish, stripped | do. | do. | 4.0 | 3.45–3.7 | Double | 1.6–1.82 | Fire opal, rhodonite, tugtupite, tourmaline | Color, crystal habit, reaction to acid, perfect rhombohedral cleavage. |
| Rhodonite | Manganese iron calcium silicate | Dark red, flesh red, with dendritic inclusions of black manganese oxide | do. | do. | 5.5–6.5 | 3.40–3.74 | do. | 1.72–1.75 | Rhodochrosite, thulite, hessonite, spinel, pyroxmangite, spessartine, tourmaline | Color, black inclusions, lack of reaction to acid, hardness. |
| Shell: | | | | | | | | | | |
| Mother-of-pearl | Calcium carbonate | White, cream, green, blue-green, with iridescent play of color | Small | do. | 3.5 | 2.6–2.85 | XX | XX | Glass and plastic imitation | Luster, iridescent play of color. |
| Pearl | do. | White, cream to black, sometimes with hint of pink, green, purple | do. | Low to high | 2.5–4.5 | 2.6–2.85 | XX | XX | Cultured and glass or plastic imitation | Luster, iridescence, x-ray of internal structure. |
| Spinel, natural | Magnesium aluminum oxide | Any | Small to medium | Medium | 8.0 | 3.5–3.7 | Single | 1.72 | Synthetic, garnet | Refractive index, single refraction, inclusions. |
| Spinel, synthetic | do. | do. | Up to 40 carats | Low | 8.0 | 3.5–3.7 | Double | 1.73 | Spinel, corundum, beryl, topaz, alexandrite | Weak double refraction, curved striae, bubbles. |
| Spodumene: | | | | | | | | | | |
| Hiddenite | Lithium aluminum silicate | Yellow to green | Medium | Medium | 6.5–7.0 | 3.13–3.20 | do. | 1.66 | Synthetic spinel | Refractive index, color, pleochroism. |
| Kunzite | do. | Pink to lilac | do. | do. | 6.5–7.0 | 3.13–3.20 | Double | 1.66 | Amethyst, morganite | Do. |
| Tanzanite | Complex silicate | Blue to lavender | Small | High | 6.0–7.0 | 3.3 | do. | 1.69 | Sapphire, synthetics | Strong trichroism, color. |
| Topaz | Lithium aluminum silicate | White, blue, green, pink, yellow, gold | Medium | Low to medium | 8.0 | 3.4–3.6 | do. | 1.62 | Beryl, quartz | Color, density, hardness, refractive index, perfect in basal cleavage. |
| Tourmaline | do. | Any, including mixed | do. | do. | 7.0–7.5 | 2.98–3.20 | do. | 1.63 | Peridot, beryl, garnet corundum, glass | Double refraction, color, refractive index. |

See footnotes at end of table.

TABLE 1—Continued
GUIDE TO SELECTED GEMSTONES AND GEM MATERIALS USED IN JEWELRY

| Name | Composition | Color | Practical size ¹ | Cost ² | Mohs | Specific gravity | Refraction | Refractive index | May be confused with | Recognition characteristics |
|-----------|--|--|-----------------------------|-------------------|---------|------------------|-----------------|------------------|---|--|
| Turquoise | Copper aluminum phosphate | Blue to green with black, brown-red inclusions | Large | Low | 6.0 | 2.60–2.83 | Double | 1.63 | Chrysocolla, dyed howlite, dumortierite, glass, plastics, variscite | Difficult if matrix not present, matrix usually limonitic. |
| Unakite | Granitic rock, feldspar, epidote, quartz | Olive green, pink, and blue-gray | do. | do. | 6.0–7.0 | 2.60–3.20 | XX | XX | XX | Olive green, pink, gray-blue colors. |
| Zircon | Zirconium silicate | White, blue, brown, yellow, or green | Small to medium | Low to medium | 6.0–7.5 | 4.0–4.8 | Double (strong) | 1.79–1.98 | Diamond, synthetics, topaz, aquamarine | Double refraction, strongly dichroic, wear on facet edges. |

Do., do. Ditto. XX Not applicable.

¹Small: up to 5 carats; medium: 5 to 50 carats; large: more than 50 carats.

²Low: up to \$25 per carat; medium: up to \$200 per carat; high: more than \$200 per carat.

TABLE 2
LABORATORY-CREATED GEMSTONE PRODUCTION METHODS

| Gemstone | Production method | Company/producer | Date of first production |
|-----------------|-------------------|-----------------------------|--------------------------|
| Alexandrite | Flux | Creative Crystals Inc. | 1970s. |
| Do. | Melt pulling | J.O. Crystal Co., Inc. | 1990s. |
| Do. | do. | Kyocera Corp. | 1980s. |
| Do. | Zone melt | Seiko Corp. | Do. |
| Cubic zirconia | Skull melt | Various producers | 1970s. |
| Emerald | Flux | Chatham Created Gems | 1930s. |
| Do. | do. | Gilson | 1960s. |
| Do. | do. | Kyocera Corp. | 1970s. |
| Do. | do. | Lennox | 1980s. |
| Do. | do. | Russia | Do. |
| Do. | do. | Seiko Corp. | Do. |
| Do. | Hydrothermal | Biron Corp. | Do. |
| Do. | do. | Lechleitner | 1960s. |
| Do. | do. | Regency | 1980s. |
| Do. | do. | Russia | Do. |
| Ruby | Flux | Chatham Created Gems | 1950s. |
| Do. | do. | Douras | 1990s. |
| Do. | do. | J.O. Crystal Co., Inc. | 1980s. |
| Do. | do. | Kashan Created Ruby | 1960s. |
| Do. | Melt pulling | Kyocera Corp. | 1970s. |
| Do. | Verneuil | Various producers | 1900s. |
| Do. | Zone melt | Seiko Corp. | 1980s. |
| Sapphire | Flux | Chatham Created Gems | 1970s. |
| Do. | Melt pulling | Kyocera Corp. | 1980s. |
| Do. | Verneuil | Various producers | 1900s. |
| Do. | Zone melt | Seiko Corp. | 1980s. |
| Star ruby | Melt pulling | Kyocera Corp. | Do. |
| Do. | do. | Nakazumi Earth Crystals Co. | Do. |
| Do. | Verneuil | Linde Air Products Co. | 1940s. |
| Star sapphire | do. | do. | Do. |
| Do., do. Ditto. | | | |

TABLE 3
ESTIMATED VALUE OF U.S. NATURAL GEMSTONE PRODUCTION,
BY GEM TYPE¹

(Thousand dollars)

| Gem materials | 2009 | 2010 |
|--------------------------------|--------------------|--------|
| Beryl | 918 ^r | 1,700 |
| Coral, all types | 150 | 150 |
| Diamond | (2) | (2) |
| Garnet | 148 | 149 |
| Gem feldspar | 858 | 693 |
| Geode/nodules | 105 | 110 |
| Opal | 225 | 189 |
| Quartz: | | |
| Macrocrystalline ³ | 231 | 273 |
| Cryptocrystalline ⁴ | 216 | 208 |
| Sapphire/ruby | 256 | 344 |
| Shell | 713 | 821 |
| Topaz | (2) | (2) |
| Tourmaline | 112 | 95 |
| Turquoise | 531 | 449 |
| Other | 4,850 | 4,840 |
| Total | 9,310 ^r | 10,000 |

^rRevised.

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

²Less than ½ unit.

³Macrocrystalline quartz (crystals recognizable with the naked eye) includes amethyst, aventurine, blue quartz, citrine, hawk's eye, pasiolite, prase, quartz cat's eye, rock crystal, rose quartz, smoky quartz, and tiger's eye.

⁴Cryptocrystalline quartz (microscopically small crystals) includes agate, carnelian, chalcedony, chrysoprase, fossilized wood, heliotrope, jasper, moss agate, onyx, and sard.

TABLE 4
 PRICES PER CARAT OF U.S. CUT ROUND DIAMONDS, BY SIZE AND QUALITY IN 2010

| Carat weight | Description, color ² | Clarity ¹ (GIA terms) | Representative prices | | |
|--------------|---------------------------------|-------------------------------------|-----------------------|-------------------|-----------------------|
| | | | January ³ | June ⁴ | December ⁵ |
| 0.25 | G | VS1 | \$1,400 | \$1,400 | \$1,400 |
| Do. | G | VS2 | 1,300 | 1,300 | 1,300 |
| Do. | G | SI1 | 1,200 | 1,200 | 1,200 |
| Do. | H | VS1 | 1,350 | 1,350 | 1,350 |
| Do. | H | VS2 | 1,250 | 1,250 | 1,250 |
| Do. | H | SI1 | 1,150 | 1,150 | 1,150 |
| 0.50 | G | VS1 | 2,650 | 2,650 | 2,650 |
| Do. | G | VS2 | 2,200 | 2,200 | 2,200 |
| Do. | G | SI1 | 1,900 | 1,900 | 1,900 |
| Do. | H | VS1 | 2,350 | 2,350 | 2,350 |
| Do. | H | VS2 | 2,150 | 2,150 | 2,150 |
| Do. | H | SI1 | 1,800 | 1,800 | 1,800 |
| 1.00 | G | VS1 | 6,400 | 6,400 | 6,400 |
| Do. | G | VS2 | 5,450 | 5,450 | 5,450 |
| Do. | G | SI1 | 4,650 | 4,650 | 4,650 |
| Do. | H | VS1 | 5,300 | 5,300 | 5,300 |
| Do. | H | VS2 | 4,800 | 4,800 | 4,800 |
| Do. | H | SI1 | 4,225 | 4,225 | 4,225 |
| 2.00 | G | VS1 | 11,400 | 11,900 | 12,100 |
| Do. | G | VS2 | 10,900 | 11,200 | 11,500 |
| Do. | G | SI1 | 8,800 | 8,800 | 9,100 |
| Do. | H | VS1 | 9,300 | 9,300 | 9,500 |
| Do. | H | VS2 | 9,000 | 9,000 | 9,100 |
| Do. | H | SI1 | 8,000 | 8,000 | 8,250 |

Do. Ditto.

¹Clarity: IF—no blemishes; VVS1—very, very slightly included; VS1—very slightly included; VS2—very slightly included, but not visible; SI1—slightly included.

²Gemological Institute of America (GIA) color grades: D—colorless; E—rare white; G, H, I—traces of color.

³Source: The Gem Guide, v. 29, no. 1, January/February 2010, p. 20–22.

⁴Source: The Gem Guide, v. 29, no. 4, July/August 2010, p. 20–22.

⁵Source: The Gem Guide, v. 29, no. 6, November/December 2010, p. 20–22.

TABLE 5
 PRICES PER CARAT OF U.S. CUT COLORED GEMSTONES IN 2010

| Gemstone | Price range per carat | |
|---------------------------------------|-----------------------|-----------------------|
| | January ¹ | December ² |
| Amethyst | \$10–25 | \$10–25 |
| Blue sapphire | 900–1,650 | 950–1,800 |
| Blue topaz | 5–10 | 5–10 |
| Emerald | 2,400–4,000 | 2,400–4,000 |
| Green tourmaline | 50–70 | 50–70 |
| Cultured saltwater pearl ³ | 5 | 5 |
| Pink tourmaline | 70–150 | 70–150 |
| Rhodolite garnet | 20–40 | 22–45 |
| Ruby | 1,850–2,200 | 1,850–2,200 |
| Tanzanite | 300–375 | 300–375 |

¹Source: The Gem Guide, v. 29, no. 1, January/February 2010, p. 48, 51, 55, 59, 61, 63, and 66–69. These figures are approximate wholesale purchase prices paid by retail jewelers on a per stone basis for 1 to less than 1 carat fine-quality stones.

²Source: The Gem Guide, v. 29, no. 6, November/December 2010, p. 50, 53, 57, 61, 63, 65, and 68–71. These figures are approximate wholesale purchase prices paid by retail jewelers on a per-stone basis for 1 to less than 1 carat fine-quality stones.

³Prices are per 4.5–5-millimeter pearl.

TABLE 6
U.S. EXPORTS AND REEXPORTS OF DIAMOND (EXCLUSIVE OF INDUSTRIAL
DIAMOND), BY COUNTRY¹

| Country | 2009 | | 2010 | |
|----------------------|----------------------|----------------------------------|----------------------|----------------------------------|
| | Quantity (carats) | Value ² (millions) | Quantity (carats) | Value ² (millions) |
| Exports: | | | | |
| Australia | 37,600 | \$21 | 33,000 | \$34 |
| Belgium | 300,000 | 150 | 346,000 | 396 |
| Canada | 46,600 | 70 | 52,000 | 87 |
| Costa Rica | 8,470 | 2 | 9,430 | 2 |
| France | 49,200 | 25 | 33,000 | 94 |
| Hong Kong | 807,000 | 380 | 1,910,000 | 448 |
| India | 962,000 | 477 | 1,300,000 | 825 |
| Israel | 960,000 | 482 | 419,000 | 365 |
| Japan | 17,800 | 5 | 3,400 | 9 |
| Mexico | 504,000 | 79 | 561,000 | 84 |
| Netherlands | 561 | 1 | 1,150 | 9 |
| Netherlands Antilles | 10,600 | 23 | 12,700 | 34 |
| Singapore | 31,200 | 13 | 8,690 | 10 |
| South Africa | 829 | 2 | 636 | 7 |
| Switzerland | 152,000 | 146 | 147,000 | 177 |
| Taiwan | 12,900 | 5 | 9,080 | 4 |
| Thailand | 86,700 | 40 | 92,500 | 14 |
| United Arab Emirates | 108,000 | 46 | 193,000 | 68 |
| United Kingdom | 27,400 | 58 | 325,000 | 58 |
| Other | 156,000 | 133 | 2,250,000 | 139 |
| Total | 4,280,000 | 2,160 | 7,710,000 | 2,860 |
| Reexports: | | | | |
| Armenia | 1,670 | (3) | 1,880 | (3) |
| Australia | 59,600 | 19 | 16,300 | 16 |
| Belgium | 4,130,000 | 1,110 | 2,410,000 | 1,600 |
| Canada | 139,000 | 127 | 143,000 | 144 |
| Dominican Republic | 15,300 | 3 | 10,500 | 1 |
| France | 80,800 | 43 | 47,900 | 78 |
| Guatemala | 50,300 | 5 | 46,000 | 5 |
| Hong Kong | 3,220,000 | 1,190 | 4,340,000 | 1,820 |
| India | 2,350,000 | 959 | 2,730,000 | 1,900 |
| Israel | 6,940,000 | 2,750 | 4,390,000 | 4,110 |
| Japan | 117,000 | 24 | 98,200 | 32 |
| Malaysia | 9,860 | 1 | 2,480 | 2 |
| Mexico | 2,990 | 2 | 5,780 | 1 |
| Singapore | 193,000 | 50 | 65,500 | 24 |
| South Africa | 66,500 | 55 | 29,300 | 45 |
| Switzerland | 584,000 | 492 | 429,000 | 565 |
| Thailand | 145,000 | 29 | 160,000 | 31 |
| United Arab Emirates | 749,000 | 198 | 338,000 | 188 |
| United Kingdom | 383,000 | 204 | 166,000 | 269 |
| Other | 1,710,000 | 534 | 598,000 | 407 |
| Total | 20,900,000 | 7,780 | 16,000,000 | 11,200 |
| Grand total | 25,200,000 | 9,940 | 23,700,000 | 14,100 |

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

²Customs value.

³Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 7
U.S. IMPORTS FOR CONSUMPTION OF DIAMOND, BY KIND, WEIGHT, AND COUNTRY¹

| Kind, range, and country of origin | 2009 | | 2010 | |
|---|----------------------|----------------------------------|----------------------|----------------------------------|
| | Quantity (carats) | Value ² (millions) | Quantity (carats) | Value ² (millions) |
| Rough or uncut, natural: ³ | | | | |
| Angola | 359,000 | \$48 | 67,000 | \$132 |
| Australia | 17,700 | 2 | 8,060 | 1 |
| Botswana | 88,100 | 35 | 81,500 | 68 |
| Brazil | 443 | (4) | -- | -- |
| Canada | 27,300 | 32 | 35,300 | 43 |
| Congo (Kinshasa) | 11,600 | 7 | 6,650 | 7 |
| Ghana | 250 | (4) | 135 | (4) |
| Guyana | 212 | (4) | 534 | (4) |
| India | 32,700 | 1 | 12,900 | 1 |
| Namibia | 10,000 | 6 | 7,450 | 9 |
| Russia | 16,500 | 3 | 37,500 | 8 |
| South Africa | 104,000 | 112 | 102,000 | 223 |
| Other | 32,000 | 43 | 29,400 | 31 |
| Total | 700,000 | 289 | 389,000 | 524 |
| Cut but unset, not more than 0.5 carat: | | | | |
| Belgium | 344,000 | 127 | 281,000 | 106 |
| Canada | 7,910 | 7 | 13,000 | 9 |
| China | 25,800 | 18 | 37,500 | 21 |
| Dominican Republic | 38,200 | 10 | 7,250 | 2 |
| Hong Kong | 239,000 | 24 | 180,000 | 25 |
| India | 5,760,000 | 1,150 | 7,310,000 | 1,560 |
| Israel | 400,000 | 198 | 433,000 | 207 |
| Mauritius | 6,920 | 15 | 5,780 | 15 |
| Mexico | 65,900 | 10 | 92,300 | 21 |
| South Africa | 1,780 | 10 | 9,440 | 13 |
| Thailand | 60,800 | 17 | 93,400 | 14 |
| United Arab Emirates | 153,000 | 30 | 77,100 | 17 |
| Other | 57,400 | 39 ^r | 63,900 | 49 |
| Total | 7,160,000 | 1,650 | 8,610,000 | 2,060 |
| Cut but unset, more than 0.5 carat: | | | | |
| Belgium | 640,000 | 2,130 | 706,000 | 2,900 |
| Canada | 20,200 | 60 | 23,300 | 83 |
| Hong Kong | 26,800 | 76 | 42,200 | 102 |
| India | 1,110,000 | 1,930 | 1,900,000 | 3,610 |
| Israel | 1,670,000 | 5,350 | 2,000,000 | 7,530 |
| Mexico | 1,810 | 3 | 1,250 | 1 |
| Russia | 57,800 | 137 | 25,300 | 98 |
| South Africa | 34,700 | 533 | 63,000 | 892 |
| Switzerland | 23,500 | 238 | 11,300 | 391 |
| Thailand | 3,980 | 9 | 5,910 | 13 |
| United Arab Emirates | 33,900 | 60 | 10,100 | 42 |
| Other | 53,200 | 256 | 73,800 | 343 |
| Total | 3,670,000 | 10,800 | 4,860,000 | 16,000 |

^rRevised. -- Zero.

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

²Customs value.

³Includes some natural advanced diamond.

⁴Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 8
U.S. IMPORTS FOR CONSUMPTION OF GEMSTONES, OTHER THAN
DIAMOND, BY KIND AND COUNTRY¹

| Kind and country | 2009 | | 2010 | |
|----------------------|----------------------|----------------------------------|----------------------|----------------------------------|
| | Quantity (carats) | Value ² (millions) | Quantity (carats) | Value ² (millions) |
| Emerald: | | | | |
| Belgium | 1,980 | \$1 | 1,340 | (3) |
| Brazil | 500,000 | 7 | 120,000 | \$7 |
| Canada | 434 | (3) | 4 | (3) |
| China | 4,150 | (3) | 13,800 | 1 |
| Colombia | 314,000 | 120 | 406,000 | 131 |
| France | 315 | 2 | 1,480 | 2 |
| Germany | 8,470 | 2 | 54,000 | 2 |
| Hong Kong | 334,000 | 23 | 246,000 | 17 |
| India | 2,410,000 | 18 | 1,810,000 | 37 |
| Israel | 181,000 | 20 | 172,000 | 17 |
| Italy | 2,380 | 1 | 2,880 | (3) |
| Switzerland | 7,980 | 8 | 6,290 | 13 |
| Thailand | 292,000 | 8 | 487,000 | 10 |
| United Kingdom | 356 | 1 | 1,550 | 2 |
| Other | 38,000 | 3 | 89,400 | 15 |
| Total | 4,090,000 | 214 | 3,410,000 | 254 |
| Ruby: | | | | |
| Belgium | 10 | (3) | 16 | (3) |
| China | 2,100 | (3) | 19,200 | (3) |
| France | 37 | (3) | 1,730 | (3) |
| Germany | 8,370 | (3) | 10,900 | (3) |
| Hong Kong | 420,000 | 1 | 201,000 | 1 |
| India | 2,500,000 | 2 | 2,310,000 | 6 |
| Israel | 5,560 | 1 | 22,300 | (3) |
| Italy | 1,330 | (3) | 4,300 | (3) |
| Kenya | 16,700 | (3) | 1,810 | (3) |
| Sri Lanka | 2,020 | 1 | 3,800 | (3) |
| Switzerland | 933 | 3 | 129 | 2 |
| Thailand | 1,750,000 | 14 | 1,880,000 | 22 |
| United Arab Emirates | 64 | 2 | 210 | (3) |
| Other | 179,000 | 13 | 168,000 | 11 |
| Total | 4,880,000 | 37 | 4,630,000 | 42 |
| Sapphire: | | | | |
| Australia | 2,340 | (3) | 1,190 | (3) |
| Austria | 472 | (3) | 3,380 | (3) |
| Belgium | 283 | 1 | 2,420 | 1 |
| China | 122,000 | 1 | 56,700 | 3 |
| Dominican Republic | 600 | (3) | -- | -- |
| Germany | 33,200 | 5 | 123,000 | 4 |
| Hong Kong | 610,000 | 13 | 536,000 | 9 |
| India | 2,140,000 | 6 | 2,570,000 | 20 |
| Israel | 9,780 | 1 | 19,300 | 2 |
| Italy | 15,000 | 1 | 5,440 | 1 |
| Singapore | 3,010 | (3) | -- | -- |
| Sri Lanka | 240,000 | 31 | 309,000 | 66 |
| Switzerland | 14,700 | 14 | 13,700 | 20 |
| Thailand | 1,730,000 | 48 | 2,630,000 | 78 |
| United Arab Emirates | 2,530 | 2 | 319 | (3) |
| United Kingdom | 504 | 1 | 610 | 1 |

See footnotes at end of table.

TABLE 8—Continued
 U.S. IMPORTS FOR CONSUMPTION OF GEMSTONES, OTHER THAN
 DIAMOND, BY KIND AND COUNTRY¹

| Kind and country | 2009 | | 2010 | |
|-----------------------------------|----------------------|----------------------------------|----------------------|----------------------------------|
| | Quantity (carats) | Value ² (millions) | Quantity (carats) | Value ² (millions) |
| Sapphire—Continued: | | | | |
| Other | 68,200 | \$3 | 44,800 | \$8 |
| Total | 4,990,000 | 127 | 6,320,000 | 214 |
| Other: | | | | |
| Rough, uncut, all countries | NA | 8 | NA | 15 |
| Cut, set and unset, all countries | NA | 29 | NA | 32 |

NA Not available. -- Zero.

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

²Customs value.

³Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 9
VALUE OF U.S. IMPORTS OF LABORATORY-CREATED
AND IMITATION GEMSTONES, BY COUNTRY^{1,2}

(Thousand dollars)

| Country | 2009 | 2010 |
|---|--------|--------|
| Laboratory-created, cut but unset: | | |
| Austria | 1,430 | 1,950 |
| Brazil | 374 | 96 |
| Canada | 9 | -- |
| China | 7,600 | 5,700 |
| Czech Republic | 42 | 118 |
| France | 284 | 232 |
| Germany | 11,100 | 10,100 |
| Hong Kong | 455 | 549 |
| India | 2,180 | 9,870 |
| Italy | 95 | 78 |
| Japan | 61 | 25 |
| Korea, Republic of | 46 | 53 |
| Netherlands | 5 | 29 |
| Sri Lanka | 315 | 35 |
| Switzerland | 797 | 500 |
| Taiwan | 161 | 186 |
| Thailand | 975 | 723 |
| United Arab Emirates | 98 | -- |
| Other | 3,390 | 2,050 |
| Total | 29,500 | 32,300 |
| Imitation:³ | | |
| Austria | 47,100 | 51,400 |
| Brazil | 2 | -- |
| China | 13,300 | 13,300 |
| Czech Republic | 5,080 | 5,070 |
| France | -- | 5 |
| Germany | 566 | 726 |
| Hong Kong | 358 | 158 |
| India | 302 | 125 |
| Italy | 123 | 164 |
| Korea, Republic of | 131 | 282 |
| Taiwan | -- | 25 |
| Thailand | 39 | 28 |
| United Kingdom | 3 | -- |
| Other | 208 | 406 |
| Total | 67,200 | 71,700 |

-- Zero.

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

²Customs value.

³Includes pearls.

Source: U.S. Census Bureau.

TABLE 10
U.S. IMPORTS FOR CONSUMPTION OF GEMSTONES¹

(Thousand carats and thousand dollars)

| Stones | 2009 | | 2010 | |
|---|-----------|-------------------------|-----------|--------------------|
| | Quantity | Value ² | Quantity | Value ² |
| Coral and similar materials, unworked | 4,430 | 10,500 | 5,760 | 12,000 |
| Diamonds: | | | | |
| Cut but unset | 10,800 | 12,400,000 ^r | 13,500 | 18,100,000 |
| Rough or uncut | 700 | 289,000 | 389 | 524,000 |
| Emeralds, cut but unset | 4,090 | 214,000 | 3,140 | 254,000 |
| Pearls: | | | | |
| Cultured | NA | 26,900 | NA | 15,800 |
| Imitation | NA | 4,150 | NA | 5,100 |
| Natural | NA | 21,100 | NA | 22,900 |
| Rubies and sapphires, cut but unset | 9,880 | 164,000 | 10,900 | 256,000 |
| Other precious and semiprecious stones: | | | | |
| Rough, uncut | 1,080,000 | 15,000 | 1,400,000 | 30,700 |
| Cut, set and unset | NA | 247,000 | NA | 276,000 |
| Other | 91,100 | 11,600 | 78,100 | 11,300 |
| Laboratory-created: | | | | |
| Cut but unset | 8,730 | 29,500 | 6,800 | 32,300 |
| Other | NA | 8,240 | NA | 14,600 |
| Imitation gemstone ³ | NA | 67,200 | NA | 66,600 |
| Total | 1,200,000 | 13,500,000 ^r | 1,520,000 | 19,600,000 |

^rRevised. NA Not available.

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

²Customs value.

³Does not include pearls.

Source: U.S. Census Bureau.

TABLE 11
NATURAL DIAMOND: WORLD PRODUCTION, BY COUNTRY AND TYPE^{1,2,3}

(Thousand carats)

| Country and type ⁴ | 2006 | 2007 | 2008 | 2009 | 2010 |
|---------------------------------------|----------------------------|----------------------------|----------------------------|----------------------------|---------------------|
| Gemstones: | | | | | |
| Angola | 8,258 | 8,732 | 8,016 | 12,445 | 12,500 ^e |
| Armenia | 184 | 123 | 101 | 50 | 50 ^e |
| Australia | 7,305 | 231 | 273 | 220 ^{r,e} | 100 ^e |
| Botswana ^c | 24,000 | 25,000 | 25,000 | 24,000 | 25,000 |
| Brazil ^c | 181 | 182 | 182 | 200 ^{r,5} | 200 |
| Canada | 13,278 | 17,144 | 14,803 | 10,946 | 11,773 |
| Central African Republic ^c | 340 | 370 | 302 ^{r,5} | 249 ^{r,5} | 250 |
| China ^c | 100 | 100 | 100 | 100 | 100 |
| Congo (Kinshasa) | 5,800 | 5,700 | 4,200 | 3,700 ^r | 5,500 |
| Côte d'Ivoire ^e | -- ^r | -- ^r | -- ^r | -- ^r | -- |
| Ghana | 768 | 671 | 478 | 301 ^r | 300 ^e |
| Guinea | 355 | 815 | 2,500 | 557 ^r | 550 |
| Guyana | 341 | 269 | 169 | 144 | 144 ^e |
| Lesotho | 231 | 454 | 450 ^e | 450 ^e | 460 |
| Namibia | 2,400 | 2,266 | 2,435 | 1,192 ^r | 1,200 ^e |
| Russia ^c | 23,400 | 23,300 | 21,925 ⁵ | 17,791 ⁵ | 17,800 |
| Sierra Leone | 362 | 362 | 223 | 241 ^r | 240 ^e |
| South Africa ^c | 6,100 | 6,100 | 5,200 | 2,500 ^r | 3,500 |
| Tanzania ^e | 230 | 239 | 202 | 155 ^r | 77 |
| Venezuela ^c | 45 | 45 | 45 | 45 | 45 |
| Zimbabwe ^c | 160 | 100 | 100 | 100 | 50 |
| Other ⁶ | 70 | 75 ^r | 121 ^r | 79 ^r | 70 |
| Total | 93,900^r | 92,300^r | 86,800^r | 75,500^r | 79,900 |
| Industrial: | | | | | |
| Angola ^e | 918 | 970 | 900 | 1,383 ^{r,5} | 1,300 |
| Australia | 21,915 | 18,960 | 15,397 | 10,700 | 9,900 |
| Botswana ^c | 8,000 | 8,000 | 8,000 | 7,000 | 7,000 |
| Brazil ^c | 600 | 600 | 600 | 600 | 600 |
| Central African Republic ^c | 85 | 93 | 74 ⁵ | 62 ^{r,5} | 60 |
| China ^c | 965 | 970 | 1,000 | 1,000 | 1,000 |
| Congo (Kinshasa) | 23,100 | 22,600 | 16,700 | 14,600 ^r | 22,200 |
| Côte d'Ivoire ^e | -- ^r | -- ^r | -- ^r | -- ^r | -- |
| Ghana | 192 | 168 | 120 | 75 ^r | 75 ^e |
| Guinea | 118 | 200 | 600 | 139 ^r | 130 |
| Russia ^c | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 |
| Sierra Leone | 241 | 241 | 149 | 160 ^r | 160 ^e |
| South Africa ^c | 9,100 | 9,100 | 7,700 | 3,600 ^r | 5,400 |
| Tanzania ^e | 42 | 44 | 36 ^r | 27 | 14 |
| Venezuela ^c | 70 | 70 | 70 | 70 | 70 |
| Zimbabwe ^c | 900 | 600 | 700 | 850 ^r | 800 |
| Other ⁷ | 67 | 84 ^r | 145 ^r | 115 ^r | 118 |
| Total | 81,300^r | 77,700^r | 67,200^r | 55,400^r | 63,800 |
| Grand total | 175,000^r | 170,000^r | 154,000^r | 131,000^r | 144,000 |

^eEstimated. ^rRevised. -- Zero.

¹World totals and estimated data are rounded to no more than three significant digits; may not add to totals shown.

²Table includes data available through June 2, 2011.

³In addition to the countries listed, Nigeria and the Republic of Korea produce natural diamond and synthetic diamond, respectively, but information is inadequate to formulate reliable estimates of output levels.

TABLE 11—Continued
NATURAL DIAMOND: WORLD PRODUCTION, BY COUNTRY AND TYPE^{1,2,3}

⁴Includes near-gem and cheap-gem qualities.

⁵Reported figure.

⁶Includes Cameroon, Congo (Brazzaville), Gabon (unspecified), India, Indonesia, Liberia, and Togo (unspecified).

⁷Includes Congo (Brazzaville), India, Indonesia, and Liberia.