



2015 Minerals Yearbook

AUSTRALIA [ADVANCE RELEASE]

THE MINERAL INDUSTRY OF AUSTRALIA

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During the past 10 years, Australia's mineral industry benefited from a significant boom in investment. This investment was driven by increases in the prices of Australia's key mineral commodity exports—particularly coal and iron ore—owing largely to high demand in China, which was Australia's largest export market. In the past few years, however, China's slowing economic growth led to lower demand and decreases in the prices of coal and iron ore, which negatively affected Australia's export revenue. In 2015, Australia's mineral sector continued the transition from an investment phase to a production phase. Investment in mining, which peaked in 2013, decreased by 30% in fiscal year 2016.¹ This decrease in investment was attributed to decreased international demand for minerals. Despite the decrease in investment and prices, however, Australia's iron ore and coal production (bituminous, subbituminous, and lignite) remained at record levels, increasing by 3% in fiscal year 2015. The record-level production was attributed to major development projects, which were the result of the record levels of investment in previous years (Department of Industry, Innovation, and Science, 2016a, p. 13, 28, 37–38).

Australia continued to be among the world's leading producers of such mineral commodities as bauxite, coal, cobalt, copper, gem and near-gem diamond, gold, gypsum, ilmenite, iron ore, lead, lithium, manganese, nickel, phosphate rock, rare-earth elements, rutile, salt, silver, tin, uranium, zinc, and zirconium. Australia accounted for more than 45% of the world's production of lithium; 36%, iron ore; 28%, bauxite; 23%, industrial diamond; 17%, alumina; 15%, industrial garnet; 14%, manganese; 13%, lead; 9%, nickel; 9%, gold; 5%, copper; and nearly 5%, cobalt. Australia was ranked fourth in global coal production, accounting for 7% of the world's production of coal (BP p.l.c., 2016, p. 30; Bray, 2017a, b; Brininstool, 2017; Corathers, 2017; George, 2017; Guberman, 2017; Jaskula, 2017; Kuck, 2017; Olson, 2017; Shedd, 2017).

Minerals in the National Economy

In fiscal year 2016, mining accounted for 6.9% of Australia's gross domestic product (GDP). The gross output of the mining sector overall increased in value by 6.2% to 114.9 billion Australian dollars (AUD) (US\$85.4 billion).² The mineral commodities with the largest decreases in gross output were iron ore, which decreased in value by AUD15.5 billion (US\$11.5 billion), or by 22.0%, and industrial minerals, which decreased in value by AUD13.7 billion (US\$10.2 billion), or by 13.2%. The gross output of gold increased in value by AUD1.67 billion (US\$1.24 billion), or by 12.5%; gold was the only sector in the mineral industry for which the value of gross output increased. Employment in mining decreased by 8.0% in

¹Refers to Australia's 'fiscal' or 'financial' year, which ends on June 30 of the year stated.

²Where necessary, values have been converted from Australian dollars (AUD) to U.S. dollars (US\$) at the average rate of AUD1.345=US\$1.00, for 2015.

fiscal year 2015, to 163,484 people from 177,670 (Department of Industry, Innovation, and Science, 2016a, p. 37; Australian Bureau of Statistics, 2017a, b).

In calendar year 2015, the net inflow of foreign direct investment (FDI) in mining totaled AUD15.3 billion (US\$11.4 billion), which was a 57% decrease from that of 2014. Mining accounted for 51% of Australia's total net inflow of FDI. The total net inflow of FDI to Australia from Japan increased by 145% to AUD14.1 billion (US\$10.5 billion) and accounted for 48% of Australia's total, making Japan the leading source of FDI to Australia. The United States accounted for the second largest share of Australia's total net inflow of FDI, accounting for 33%. Other significant sources of FDI were, in order of the value of investment, the European Union, the Netherlands, and China (including Hong Kong) (Department of Foreign Affairs and Trade, 2016b, p. 42, 72).

Earnings from Australia's top mineral exports, which included alumina, aluminum, coal (metallurgical and thermal), copper, gold, iron ore, liquefied natural gas (LNG), nickel, petroleum, uranium, and zinc, decreased by 8.8% to AUD143 billion (US\$106 billion) in fiscal year 2015. Nonfuel minerals from this list accounted for 60% of the total. The largest increases in the value of exports was for gold, which increased by 20% to AUD2.6 billion (US\$1.9 billion), and uranium, which increased by 80% to AUD430 million (US\$320 million). The largest decreases in the value of exports was for iron ore and coal (metallurgical and thermal), which decreased by 12% or AUD6.8 billion (US\$5.1 billion) and by 9.6% or AUD3.6 billion (US\$2.7 billion), respectively (Department of Industry, Innovation, and Science, 2015, p. 10; 2016b, p. 21).

In fiscal year 2015, capital expenditures in the mineral sector as a whole decreased by 30% to AUD53 billion (US\$39 billion), which was the lowest level of the past 5 years. In calendar year 2015, expenditures on mineral exploration decreased by 37% to AUD4.1 billion (US\$3.1 billion). Of this amount, offshore petroleum exploration accounted for 44%, followed by nonpetroleum mineral exploration (35%), and onshore petroleum exploration (21%) (Department of Industry, Innovation, and Science, 2016b; 2016c, p. 15–17).

Government Policies and Programs

Land ownership in Australia is divided into the following two overarching categories: freehold land, which includes land that is held by traditional owner groups, such as Aboriginal and Torres Strait Islander land groups; and nonfreehold land, or public land, commonly known as Crown land. Mineral resources, irrespective of whether they are located on freehold or Crown land, are owned by the Government of Australia. The right to mine these minerals is contained in the individual State laws that govern mineral rights (Australian Trade and Investment Commission, 2017).

In Australia's three-tiered Government system—local, State or Territory, and Federal—each State or Territory establishes its own legal framework for the mineral sector and has the authority to grant mining rights. All States and Territories, with the exception of the Australian Capital Territory, have identified mineral resources and established mineral industries. States and Territories do not engage in commercial exploration or development of minerals, however; these activities are carried out by the private sector. Federal, State, and Territory governments do invest in the collection and release of geoscientific data. The Federal Government sets national policy regarding the mineral sector as a whole, including the regulation of offshore mining operations, foreign direct investment guidelines, and taxation policy. The administration of offshore petroleum titles is overseen by the National Offshore Petroleum Titles Administrator. Environmental and safety issues are overseen by the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA). States and Territories manage and allocate mineral and petroleum property rights onshore and in coastal waters. They also regulate mining operations; oversee the adherence to environmental, occupational health, and safety laws; and collect royalties (Geoscience Australia, 2015, p. 18).

The NOPSEMA is the sole environmental assessor for offshore natural gas and petroleum projects. Offshore mineral resources are owned and managed by the respective States and Territories only for areas within 3 nautical miles from the territorial sea baseline and extending seaward to the outer limits of the continental shelf (Geoscience Australia, 2015, p. 18–19).

Australia was one of the signatories to the proposed Trans-Pacific Partnership (TPP) free-trade agreement. That agreement was aimed at promoting trade and investment across a range of sectors (including agriculture, minerals, and manufacturing) among countries of the Asia and the Pacific region. Among its other provisions, the proposed agreement would eliminate existing tariffs on key Australian mineral exports, including coal, iron ore, and LNG; allow for Australian investors to apply for an exemption from the 49% foreign equity limit on the ownership of uranium mines in Canada; allow Australian companies to invest in Mexico's energy sector; and allow Australian companies to invest in the mineral sectors of Brunei and Malaysia. The TPP agreement was not fully ratified by all parties, however, and the agreement did not enter into force (Calms, 2015; Department of Foreign Affairs and Trade, 2016c, p. 1, 7–8; 2016d, p. 1–2).

Production

Mineral commodities for which output decreased by greater than 10% in 2015 included barite, by 59%; liquefied petroleum gas, 28%; silver (mine output), 26%; zirconium, 25%; refined petroleum products, 21%; magnesite and natural abrasives (garnet), 16% each; mine output of nickel, 15%; and mine output of lead, 10%. Mineral commodities for which output increased by more than 10% included rutile, by 51%; rare-earth oxide equivalent, 50%; lead bullion, 48%; diamond (industrial), 47%; diamond (gem), 35%; phosphate rock (gross weight), 14%; natural gas and refined silver, 13% each; and gypsum, 12% (table 1).

Structure of the Mineral Industry

All mining operations in Australia were privately owned. The share of foreign ownership in all Australian businesses combined was 28.2%; the mineral sector had the highest proportion of foreign ownership at 30.2%. As of June 30th, the share of mining companies with 10% or greater foreign ownership was 15.8%, and those with 50% or greater foreign ownership was 7.8%. The stock of FDI in Australia's mineral industry increased by 6.4% in 2015 to AUD295 billion (US\$219 billion), which accounted for 40.1% of the total share of the stock of FDI in Australia. Australian companies also made significant investments in mining outside of the country. In 2015, Australia's stock of direct investment in mining abroad was valued at AUD82.2 billion (US\$ 61.1 billion) and accounted for 15.2% of Australia's total stock of direct investment abroad (table 2; Department of Foreign Affairs and Trade, 2016b, 47–48, 71–74).

Mineral Trade

In 2015, Australia exported nearly 767 million metric tons (Mt) of iron ore; 21.3 Mt of bauxite; 17.4 Mt of alumina, 1.5 Mt of aluminum; 1.0 Mt of copper (Cu content of ore, concentrate, intermediate products, and refined metals); 822,000 metric tons (t) of iron and steel; 782,000 t of lead (Pb content of ore, concentrates, intermediate products, and refined metal); 687,000 t of zirconium concentrate; 250,000 t of nickel; 246,000 t of rutile; about 103,000 t of ilmenite; 98,000 t of leucocoxene; and 282 t of gold. Fuel mineral exports included 202 Mt of thermal coal; 186 Mt of metallurgical coal; about 118 million barrels (Mbbbl) of crude petroleum and refinery feedstock; 30 Mt of LNG; 20 Mbbbl of liquefied petroleum gas; and 5.7 Mbbbl of petroleum refinery products (Department of Industry, Innovation, and Science, 2017, p. 16).

Australia's nonfuel mineral exports were valued at AUD102.7 billion (US\$76.4 billion) in 2015. This was a 13.5% decrease compared with the value in 2014 and a 15.1% decrease from the all-time high in 2013. Similarly, the value of Australia's mineral fuel exports decreased by 11.2% to AUD63 billion (US\$47 billion) in 2015 (Department of Industry, Innovation, and Science, 2017, p. 17).

The value of Australia's exports of goods and services decreased by 3.2% to AUD316 billion (US\$235 billion); about 78% of these exports was destined for member countries of the Asia and the Pacific Economic Cooperation (APEC)³ forum. Within the APEC, Australia's top five export markets were China, which received 28.8% of Australia's total exports; Japan, 13.4%; the United States, 7.0%; the Republic of Korea, 6.3%; and India, 4.3%. New Zealand and Singapore were also important APEC export markets, accounting for 4.0% and 3.5% of Australia's total exports of goods and services, respectively (Department of Foreign Affairs and Trade, 2016a, p. 38).

³The Asia and the Pacific Economic Cooperation (APEC) forum was established in 1989 to promote economic cooperation among its member countries. As of June 30, 2016, the member countries were Australia, Brunei, Canada, Chile, China, Indonesia; Japan, the Republic of Korea, Malaysia, Mexico, New Zealand, Papua New Guinea, Peru, the Philippines, Russia, Singapore, Taiwan, Thailand, the United States, and Vietnam.

Commodity Review

Metals

Bauxite and Alumina and Aluminum.—In 2015, Australia remained the world's leading producer of bauxite; the country was also the 2d-ranked producer of alumina after China and was among the world's top 10 producers of aluminum. Western Australia remained Australia's leading bauxite-producing State in 2015, accounting for 56.5% of total bauxite output, followed by Queensland, 34.2%, and the Northern Territory, 9.3%. Bauxite was mined at the Bald Hill Mine in Tasmania; the Gove Mine in Northern Territory; the Boddington-Worsley, the Huntly, and the Willowdale Mines in Western Australia; and the Weipa-Ely Mine in Queensland (table 2; Bray, 2017a, b; Department of Industry, Innovation, and Science, 2017).

In 2015, 87% of Australia's 20 Mt of alumina output was exported. Of the 1.6 Mt of aluminum produced in Australia, 91% of was exported. Japan was the leading destination for Australia's aluminum exports, receiving 29%, followed by the Republic of Korea, 27%; Taiwan, 10%; Thailand, 7%; Malaysia, 5%; and Indonesia, 3% (Department of Industry, Innovation, and Science, 2017).

Australian Bauxite Ltd. owned and operated the Bald Hill bauxite mine located near Campbell town in northern Tasmania. Bald Hill, which was commissioned in December 2014, was reported to have produced 63,300 t of bauxite in 2015. The first 40,000 t of bauxite from the mine was transported by rail to Bell Bay; however, as of yearend 2015, no buyer for the bauxite had been identified, and operation of the mine was expected to be suspended in early 2016 until the cargo was sold (Australian Bauxite Ltd., 2016, p. 5).

In November, Rio Tinto Ltd. of the United Kingdom approved the development of the \$1.9 billion Amrun bauxite project (previously known as South of Embley) in northern Queensland. Amrun was expected to begin production in early 2019 with an initial output of 22.8 million metric tons per year. Rio Tinto reported that the output of the Amrun project would be sufficient to replace the depleting resources of its East Weipa Mine (Rio Tinto Ltd., 2016, p. 32).

Copper.—Australia ranked sixth among the world's leading producers of mined copper. South Australia accounted for about 29% of the country's mined copper output, followed by Queensland, 28%; New South Wales, 22%; Western Australia, 20%; and Tasmania, 0.3%. Whereas mined copper output decreased by less than 1% in 2015, production of smelter copper decreased by about 7% to 433,000 t, and primary refined copper, by 7% to about 474,000 t (tables 1, 2; Brininstool, 2017; Department of Industry, Innovation, and Science, 2017, p. 25).

Of the 1.9 Mt of copper ore and concentrates (gross weight) exported in 2015, China accounted for 45% of exports, followed by Japan, 24%; India, 13%; the Republic of Korea, 6%; and the Philippines, 4%. The majority (67%) of the 448,000 t of refined copper exported in 2015 was destined for China, followed by Malaysia, 13%; Thailand, 7%; Indonesia, 5%; Vietnam, 4%; and Taiwan, 3% (Department of Industry, Innovation, and Science, 2017, p. 25).

BHP Billiton Ltd., Glencore plc of Switzerland, Newcrest Mining Ltd., OZ Minerals Ltd., and Sandfire Resources NL were Australia's leading producers of copper ore. In 2015, BHP Billiton was in the process of completing a prefeasibility study for the expansion of the Olympic Dam underground polymetallic mine. The Olympic Dam operation was a fully integrated metallurgical complex. Its facilities included a grinding and concentrating circuit, a hydrometallurgical plant with solvent extraction circuits for copper and uranium, and a recovery circuit for precious metals. Copper was also smelted and refined at the complex. In 2015, the Federal Government of Australia and the state government of South Australia approved BHP Billiton's application for the construction and operation of a heap-leach test plant (table 2; BHP Billiton Ltd., 2016, p. 80, 82).

Gold.—In 2015, Australia was the world's second-ranked producer of gold after China. Western Australia accounted for 68% of all gold produced in Australia, followed by Queensland, 7%; the Northern Territory, 6%; South Australia, 4.2%; Victoria, 2.5%; and Tasmania, 0.6%. There were more than 30 gold-mining operations in the country, most of which were located in Western Australia. Nearly 77% of the country's total primary refined gold was produced from domestic ore; about 96% of secondary refined gold came from international sources. Australia's total gold mine output increased by 2% during the year to 279 t from 274 t in 2014; primary and secondary refined gold output decreased by 0.7% to 302 t (tables 1, 2; Department of Industry, Innovation, and Science, 2017, p. 27; George, 2017).

During the year, Australia exported nearly 282 t of refined and unrefined gold bullion; 64% of these exports was destined for China (including Hong Kong); nearly 15%, for Singapore; 7%, for India; 5%, for Thailand; and 3%, for the United Kingdom (Department of Industry, Innovation, and Science, 2017, p. 27).

Iron Ore.—In 2015, production of iron ore increased by 9% to 817 Mt. Annual production of iron ore in Australia had increased every year since 1998, when production was 85 Mt. Mines in Western Australia produced the majority of iron ore in Australia, accounting for more than 98.5% of the total iron ore produced, followed by South Australia, 1.1%; and Tasmania, about 0.3%. The country exported nearly 95% of its total iron ore output in 2015. China (excluding Hong Kong) received 81% of the total iron ore exports from Australia, followed by Japan, 9.3%; and the Republic of Korea, 6.9% (table 1; Department of Industry, Innovation, and Science, 2017; Tuck, 2017).

Lead, Silver, and Zinc.—In 2015, Australia ranked second after China among the world's leading producers of both lead and zinc. Queensland accounted for 70% of Australia's mine production of lead followed by New South Wales, 15%; the Northern Territory, 8%; Tasmania, 4%; and Western Australia, 3%. Queensland also accounted for 61% of Australia's mined zinc output followed by the Northern Territory, 17%; New South Wales, nearly 10%; and Tasmania and Western Australia, about 6% each. Lead mine production decreased by 10% to 653,000 t, and zinc mine production increased by 2% to 1.58 Mt. Australia was ranked fourth (along with Russia) among the world's leading producers of silver in 2015. Mined silver production decreased by 26% to 1,374 t. Queensland accounted for about 68% of Australia's mine production of

silver followed by New South Wales, 12%; Western Australia, nearly 7%; Tasmania, nearly 6%; and the Northern Territory and South Australia, 4% each (table 1; Bennett, 2017; Department of Industry, Innovation, and Science, 2017; Guberman, 2017; Tolcin, 2017).

Australia exported 474,000 t of lead concentrate compared with 599,000 t in 2014. China accounted for 49% of Australia's lead concentrate exports, followed by the Republic of Korea, 27%; Japan, 12%; and European Union member countries, 10%. Australia exported 165,000 t of lead bullion containing precious metals, mainly silver, to the United Kingdom, which was Australia's sole lead bullion export partner. About 20% of the 231,000 t of refined lead exported in 2015 was destined for India; 17%, for the Republic of Korea; 16%, for Vietnam; 9%, for Thailand; 6%, for Malaysia; and nearly 3%, for South Africa. Of the 2.9 Mt of zinc concentrate (gross weight) exported in 2015, China received 45%, followed by the Republic of Korea, 21%; Japan, nearly 10%; the Netherlands, 8%; and Spain, 4%. Belgium, Germany, Luxemburg, and Thailand together received the remaining 7% of exports. The country exported 395,000 t of refined zinc in 2015, with China (excluding Hong Kong) receiving 37% of exports followed by the United States, 17%; Taiwan, 12%; Hong Kong, nearly 7%; Indonesia and Malaysia, 5% each; and India, 2% (Department of Industry, Innovation, and Science, 2017).

Nickel.—In 2015, Australia was ranked fourth among the world's leading producers of mined nickel. Australia's mine production of nickel decreased by 15% to 225,000 t. Nickel matte production decreased by 2.7% to 71,000 t, and production of refined nickel decreased by 5.5% to 120,000 t. BHP Billiton owned the leading nickel operation in the country, Nickel West, which included the Leinster and the Mount Keith Mines in addition to the Cliffs, the Jericho, the Venus, and the Yakabindie deposits. BHP Billiton closed the Leinster Perseverance underground mine following its suspension in 2013 owing to a seismic event that rendered the underground operations unsafe (tables 1, 2; BHP Billiton Ltd., 2016, p. 91; Kuck, 2017).

Industrial Minerals

Diamond.—All diamond in Australia was produced from mines in Western Australia. Total production of diamond increased by 46% to nearly 13.6 million carats in 2015 from 9.3 million carats (revised) in 2014. The export of unsorted diamond increased by nearly 35% to 13.0 million carats, whereas exports of gem-quality diamond decreased by 10% to 119,000 carats (Department of Industry, Innovation, and Science, 2017).

Rio Tinto was Australia's leading diamond producer. The company held 100% interest in the Argyle diamond mine, which is located 120 kilometers southwest of Kununurra in Western Australia. Rio Tinto also operated a rough-diamond cutting and polishing factory in Australia, where it processed its high-valued pink diamond from Argyle for export to international markets. In 2015, Rio Tinto continued the transition of Argyle to an underground operation and its rampup to full nameplate capacity that began in 2014. Rio Tinto reported that, as of yearend, Argyle was operating as a fully underground mine and had a

47% increase in diamond produced as a result of the rampup (Rio Tinto Ltd., 2016, p. 36).

Lithium.—Australia remained the world's leading producer of lithium. Lithium (spodumene) output came from the Greenbushes and the Mount Cattlin Mines in Western Australia. At least three companies—Altura Mining Ltd., Mineral Resources Ltd., and Neometals Ltd. (formerly Reed Resources Ltd.)—explored for lithium in 2015. Altura explored for lithium at the Pilgangoora project in the Pilabara region of Western Australia. Neometals (70%) in joint venture with Mineral Resources (30%) explored for lithium at the Mount Marion project in southwestern Kalgoorlie, Western Australia (Altura Mining Ltd., 2016, p. 14; Neometals Ltd., 2016, p. 5; Jaskula, 2017).

Salt.—Rio Tinto produced industrial salt by solar evaporation of seawater at Dampier and Port Hedland, and from underground brines at Lake MacLeod in Western Australia. Salt was exported mainly to chemical industry markets in Asia. Salt produced at these facilities decreased by 18% to 8.1 Mt (Rio Tinto Ltd., 2016, p. 37).

Mineral Fuels

Coal.—Most of the coal produced in Australia came from mining operations located in Queensland and New South Wales, although coal was also produced in South Australia, Tasmania, Victoria, and Western Australia. Queensland accounted for about 53% of the country's total mined coal output, followed by New South Wales, 45%; and Western Australia, 1.5%. Salable lignite production increased by 7.7% to 65.4 Mt in 2015. Nearly 26% of Australia's 121,000 t of high-quality metallurgical coal exports was shipped to India; 22%, to China; 17%, to Japan; nearly 14%, to the European Union; 7%, to the Republic of Korea; 4%, to Taiwan; and 3%, to Brazil. Australia's exports of thermal coal totaled 202,000 t in 2015; of this amount, China received 72%; Japan, 42%; the Republic of Korea, 19%; and Taiwan, 10% (table 1; Department of Industry, Innovation, and Science, 2017, p. 24–25).

In 2015, Rio Tinto announced the sale of its 40% share in the Bengalla Joint Venture coal mine to New Hope Corp.; the sale was expected to be completed in 2016. In December, Vale S.A. of Brazil sold its 68.4% stake in Integra Coal Mine to Glencore. As part of South32 Ltd. demerger from BHP Billiton in May, South32 acquired a 100% interest in BHP Billiton's Illwarra Metallurgical Coal operation in New South Wales. The Illwarra operation includes the Appin, the Dendrobium, and the West Cliff underground coal mines. Alcoa Inc. of the United States permanently closed its Anglesea power station and related coal mine in August owing to low electricity prices and the projected need for significant future capital expenditure. The Anglesea power station had previously supplied the Point Henry aluminum smelter until the smelter closed in 2014 (Alcoa Inc., 2016, p. 23; Rio Tinto Ltd., 2016, p. 34; South32 Ltd., 2016, p. 38; Vale S.A., 2016, p. 21).

BHP Billiton held a 50% interest in the Queensland Coal (QC) joint venture in partnership with Mitsubishi Corp. (50%). QC comprised the BHP Billiton Mitsubishi Alliance (BMA) and the BHP Billiton Mitsui Coal (BMC) properties, which were located in the Bowen Basin in central Queensland. BMA operated the

Blackwater, the Broadmeadow, the Caval Ridge, the Daunia, the Goonyella-Riverside, the Gregory Crinum, the Peak Downs, and the Saraji Mines. In 2015, BHP Billiton announced the ramping-down of production at its Crinum underground mine as its reserves depleted (BHP Billiton Ltd., 2016, p. 44).

Natural Gas.—The amount of Australia’s LNG exports continued to increase in 2015 (by 47%) and was expected to continue to increase. In 2015, Chevron Corp. of United States continued to develop the 15.6 Mt Gorgon project on Barrow Island, Western Australia, and the 8.9 Mt Wheatstone project near Onslow, Western Australia. Chevron invested \$6.4 billion in oil- and gas-producing activities in 2015, of which the construction and development of the Gorgon and Wheatstone projects accounted for the majority. The Gorgon and Wheatstone projects were expected to start production in 2016 and mid-2017, respectively (Chevron Corp., 2016a, p. 2, 13, 75; 2016b; 2017; Department of Industry, Innovation, and Science, 2016a, p. 37–38).

Outlook

Mining investment in Australia, which peaked in 2013, decreased by 30% in fiscal year 2015, and was expected to continue to decrease in the coming years. This trend was largely attributed to decreasing commodity prices and lower demand, which discourage investment in exploration and development. The slowdown of economic growth in China—Australia’s largest mineral export market—has led to decreased demand growth for iron ore and metallurgical coal exports, which were Australia’s top two export commodities. Despite decreasing investment, production of minerals increased in 2015 and is expected to continue to increase as major development projects move to the production phase. Exports of coal (metallurgical and thermal) and iron ore exports, which increased by 3% (in terms of tonnage) in fiscal year 2015, are expected to continue to increase. LNG will become a more significant component of Australia’s mineral industry in the next 2 to 5 years as the Gorgon and Wheatstone projects are brought online. Australia is projected to be the world’s leading LNG exporter by 2020 (Department of Industry, Innovation, and Science, 2016a, p. 28, 37–39).

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TABLE 1
AUSTRALIA: PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Commodity		2011	2012	2013	2014	2015
METALS						
Aluminum:						
Bauxite, gross weight	thousand metric tons	70,231 ^r	76,281 ^r	81,119	78,632 ^r	80,910
Alumina	do.	18,727 ^r	20,915 ^r	21,528	20,474 ^r	20,097
Metal, primary	do.	1,945	1,860 ^r	1,777 ^r	1,703 ^r	1,646
Antimony, Sb content of ores and concentrates		1,577	2,481	3,275	3,639 ^r	3,712
Chromium:						
Chromite, gross weight ³		219,484 ^r	460,189 ^r	312,959 ^r	23,907 ^r	--
Chromite content		96,573 ^r	202,483 ^r	137,702 ^r	10,519 ^r	--
Cobalt:						
Co content in laterite ore and Ni concentrate ⁴		3,848	5,870	6,410	5,978	6,000 ^c
Metal, refined ⁵		4,722	4,859 ⁶	4,981	5,419	5,150
Copper:						
Mine output, Cu content	thousand metric tons	961 ^r	921 ^r	1,001	966 ^r	964
Metal:						
Smelter, primary and secondary	do.	442 ^r	422	446	468	433
Refined, primary	do.	477	460	481 ^r	511 ^r	474
Gold:						
Mine output, Au content		259 ^r	250 ^r	267 ^r	274	279
Metal, refined, primary and secondary		319 ^r	308 ^r	307 ^r	304	302
Iron and steel:						
Iron ore:						
Iron ore and concentrates, gross weight	thousand metric tons	477,331 ^r	519,356 ^r	609,730 ^r	750,582 ^r	816,782
Fe content	do.	296,776 ^r	321,953 ^r	377,760 ^r	464,146 ^r	505,283
Metal:						
Pig iron	do.	5,296	3,480	3,342	3,282 ^r	3,594
Ferroalloys: ⁷						
Ferromanganese		180,200 ^r	130,900 ^r	146,900 ^r	165,300 ^r	153,100
Silicomanganese		94,700 ^r	50,800 ^r	110,100 ^r	119,400 ^r	130,700
Total		274,900 ^r	181,700 ^r	257,000 ^r	284,700 ^r	283,800
Steel, crude	thousand metric tons	6,538	4,851 ^r	4,731 ^r	4,582 ^r	4,935
Semimanufactured products ^e	do.	9,750	8,300	7,600	7,600	7,600
Lead:						
Mine output, Pb content	do.	621	621 ^r	711	728	653
Metal:						
Bullion	do.	139	147	144	109	161
Refined:						
Primary	do.	187	160	177	176	182
Secondary, excluding remelt	do.	22 ^r	17 ^r	18 ^r	17 ^r	16
Manganese ore, metallurgical:						
Gross weight	do.	6,963	7,208 ^r	7,447	7,670 ^r	7,500
Mn content	do.	2,860	2,883 ^r	2,970	3,068 ^r	3,000
Nickel:						
Mine output, Ni content	do.	215	282 ^r	291 ^r	266 ^r	225
Matte	do.	56 ^r	66	70	73 ^r	71
Metal, smelter, refined Ni and Ni content of oxide	do.	111 ^r	126 ^r	141 ^r	127 ^r	120
Platinum-group metals: ^c						
Mine output, palladium, Pd content	kilograms	350	550	600 ^r	600	600
Mine output, platinum, Pt content	do.	100	160	170 ^r	170 ^r	170
Total	do.	450 ^r	710 ^r	770 ^r	770 ^r	770

See footnotes at end of table.

TABLE 1—Continued
 AUSTRALIA: PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Commodity	2011	2012	2013	2014	2015
METALS—Continued					
Silver:					
Mine output, Ag content	1,725	1,727 ^r	1,840	1,847 ^r	1,374
Metal, refined	900 ^r	780 ^r	1,222	944	1,064
Tin, mine output, Sn content ⁸	13,874 ^r	6,158	6,472	6,898 ^r	7,158
Titanium concentrates, gross weight:					
Ilmenite	1,277	1,344	1,342	1,000	906
Leucoxene ^e	224,000	228,000	220,000	250,000	250,000
Rutile	474,000	439,000	232,000	212,000	320,000
Tungsten, mine output, W content	15	290	320	477	348
Zinc:					
Mine output, Zn content	1,510 ^r	1,536 ^r	1,522 ^r	1,552 ^r	1,583
Metal, smelter, primary	507	498	498	482	489
Zirconium concentrates, gross weight	762	605	388	798	601
INDUSTRIAL MINERALS					
Abrasives, natural, garnet	308,139	266,224	395,841	277,662	233,000 ^e
Barite	10,569	12,373	13,176	14,676	6,016
Cement, hydraulic ^c	8,600	8,500	8,400	9,000	9,100
Diamond:					
Gem ^c	380 ^r	430 ^r	570 ^r	490 ^r	660
Industrial ^c	7,180 ^r	8,190 ^r	10,900 ^r	8,800 ^r	12,900
Total	7,561 ^r	8,626 ^r	11,482 ^r	9,288 ^r	13,564
Feldspar, including nepheline syenite ^e	50,000	50,000	45,000	45,000	45,000
Gypsum	2,220	2,120	2,270	2,580	2,900 ^e
Lime ^e	2,200,000	2,200,000	2,100,000	1,950,000	1,990,000
Lithium, spodumene	421,391	456,921	421,000	425,000 ^e	450,000 ^e
Magnesite	640,000	587,000	450,000 ^e	500,000 ^{r,c}	420,000 ^e
Phosphate rock: ^{e,9}					
Gross weight	2,650,000	2,800,000	2,500,000	2,900,000 ^r	3,300,000
P ₂ O ₅ content	610,000	644,000	580,000 ^r	670,000 ^r	760,000
Rare earths, rare-earth oxide equivalent	2,188	3,222	3,000 ^e	8,000 ^e	12,000 ^e
Salt ⁹	12,250	12,500	12,900	13,000	13,000
Soda ash ^c	310	300	300	300	300
Stone and sand and gravel: ^c					
Construction sand	24,000	25,000	25,000	25,000	25,000
Limestone	22,000	21,000	20,000	20,000	20,000
Silica in the form of quartz, quartzite, glass sand	3,500	3,500	3,000	3,000	3,000
Sulfur, byproduct: ^e					
Metallurgy	800	800	810	810	810
Petroleum	60	60	90	90	90
Total	860	860	900	900	900
MINERAL FUELS AND RELATED MATERIALS					
Coal:					
Mine output, bituminous and subbituminous	469,000 ^r	504,000 ^r	543,000 ^r	571,000	571,000
Salable:					
Bituminous and subbituminous	352,000 ^r	381,000 ^r	411,000 ^r	442,000	441,000
Lignite	66,730 ^r	66,730 ^r	73,000 ^r	60,700 ^r	65,400
Total	418,730 ^r	447,730 ^r	484,000 ^r	502,700 ^r	506,400

See footnotes at end of table.

TABLE 1—Continued
 AUSTRALIA: PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Commodity	2011	2012	2013	2014	2015
MINERAL FUELS AND RELATED MATERIALS—Continued					
Natural gas marketed	54,091 ^r	58,765 ^r	60,812 ^r	65,208 ^r	73,637
Petroleum:					
Crude, includes condensate	150,119 ^r	148,377 ^r	122,154 ^r	128,954 ^r	117,619
Liquefied petroleum gas	21,851	22,134	21,335	24,927	17,882
Refinery products	236,881 ^r	229,622 ^r	220,596 ^r	209,935 ^r	166,038
Uranium, mine output, U ₃ O ₈ content	7,065 ^r	8,267 ^r	7,538 ^r	6,644 ^r	6,668

^cEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. ^rRevised. do. Ditto. -- Zero.

¹Table includes data available through March 17, 2017.

²In addition to the commodities listed, Australia produced bentonite, cadmium metal, crushed stone, diatomite, dimension stone, gravel, jade, kyanite, opal, perlite, sapphire, sulfuric acid, talc, and tin (refined, secondary), but available information was inadequate to make reliable estimates of output.

³Reported in Cr₂O₃ content by Australia in Statistical Digest, various years, and converted to gross quantity assuming 44% Cr₂O₃ ore grade.

⁴Cobalt content of lateritic nickel ore and nickel concentrate reported by the Government of Western Australia.

⁵Cobalt content of metal powder and oxide hydroxide reported by the Cobalt Development Institute, except as noted.

⁶Production reported by the Cobalt Development Institute and Glencore International AG.

⁷Reported by the International Manganese Institute.

⁸Does not include tin production from heavy mineral sand in Western Australia.

⁹Data include production from Christmas Island.

TABLE 2
AUSTRALIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(Thousand metric tons unless otherwise specified)

Commodity	Facilities, major operating companies, and major equity owners	Location of main facilities ^{1,2}	Annual capacity ⁶
Aluminum:			
Bauxite	Gove open pit bauxite mine [Pacific Aluminum (Rio Tinto Ltd., 100%)]	15 km southeast of Nhulunbuy, NT	8,000
Do.	Huntly open pit bauxite mine [Alcoa of Australia Ltd. (Alcoa World Alumina and Chemicals, 100%)]	80 km south of Perth, WA	23,000
Do.	Weipa-Ely open pit bauxite mine (Rio Tinto Ltd., 100%)	Weipa, QLD	28,000
Do.	Willowdale open pit bauxite mine [Alcoa of Australia Ltd. (Alcoa World Alumina and Chemicals, 100%)]	130 km south of Perth, WA	10,000
Do.	Boddington-Worsley open pit bauxite mine {Worsley Alumina Pty. Ltd., [South32, 86% (BHP Billiton Ltd. 100%); Japan Alumina Associates (Australia) Pty. Ltd., 10%; Sojitz Alumina Pty. Ltd., 4%]}	14 km south of Boddington, WA	19,000
Do.	Bald Hill Mine ³ (Australian Bauxite Ltd., 100%)	Campbell Town, TAS	900
Alumina, refinery	Queensland Alumina alumina refinery [Queensland Alumina Ltd. (Rio Tinto Ltd., 80%, and United Company RUSAL, 20%)]	Gladstone, QLD	3,950
Do.	Gove alumina refinery ³ (Rio Tinto Ltd., 100%)	Nhulunbuy, Gove, NT	2,650
Do.	Kwinana alumina refinery [Alcoa of Australia Ltd. (Alcoa World Alumina and Chemicals, 100%)]	Kwinana, WA	2,200
Do.	Pinjarra alumina refinery [Alcoa of Australia Ltd. (Alcoa World Alumina and Chemicals, 100%)]	Pinjarra, WA	4,200
Do.	Wagerup alumina refinery [Alcoa of Australia Ltd. (Alcoa World Alumina and Chemicals, 100%)]	East of Waroona, WA	2,600
Do.	Worsley alumina refinery {Worsley Alumina Pty. Ltd. [South32, 86% (BHP Billiton, 100%), and Japan Alumina Associates (Australia) Pty Ltd., 10%]}	20 km northwest of Collie, WA	4,600
Do.	Yarwun alumina refinery (Rio Tinto Ltd., 100%)	Gladstone, QLD	3,400
Metal smelter	Bell Bay aluminum smelter [Pacific Aluminum (Rio Tinto Ltd., 100%)]	Bell Bay, TAS	192
Do.	Boyne Island aluminum smelter [Boyne Smelters Ltd. (Rio Tinto Alcan, 59.39%; YKK Aluminum, 9.5%; UACJ Australia, 9.43%; Southern Cross Aluminum, 7.57%; Ryowa Development, 5.27%; Ryowa Development II, 6.34%; Sumitomo Chemical Co. Ltd. 2.5%)]	Boyne Island, QLD	571
Do.	Portland aluminum smelter [Alcoa of Australia, 55%; China International Trust Investment Co. (China state-owned company), 22.5%; Marubeni Australia Pty. Ltd., 22.5%]	Portland, VIC	345
Do.	Tomago aluminum smelter {Tomago Aluminium Co. Pty. Ltd. [Gove Aluminium Finance Ltd., 36.05%; Pacific Aluminum 51.55% (Rio Tinto Ltd., 100%); Hydro Aluminium, 12.40%]}	Tomago, NSW	561
Antimony	Costerfield underground antimony-gold mine [AGD Mining (Mandalay Resources Ltd., 100%)]	50 km east and southeast of Bendigo, VIC	5
Do.	Hillgrove Mine ³ (Bracken Resources Pty Ltd. 100%)	25 km east of Armidale, NSW	10
Bentonite	Arumpo open pit bentonite mine (Arumpo Bentonite Pty. Ltd., 100%)	95 km northeast of Mildura, NSW	30
Do.	Cedars open pit bentonite mine (PCP Douglass Pty. Ltd., 100%)	10 km southwest of Yarraman, QLD	20
Do.	Cressfield open pit bentonite mine (Sibelco Group through Sibelco Australia Ltd., 100%)	15 km north of Scone, NSW	12
Do.	Mantuan Downs (Pacific Enviromin Ltd., 100%)	West of Springsure, QLD	100
Do.	Miles open pit bentonite mine (Unimin Australia Ltd., 100%)	350 km west of Brisbane, QLD	100
Cement	Adelaide Brighton Cement Pty Ltd., 100%	Angaston, SA	250
Do.	do.	Birkenhead, SA	1,200
Do.	do.	Geelong, VIC	800
Do.	do.	Munster, SA	590
Do.	Blue Circle Southern Cement Ltd. (Boral Ltd., 100%)	Berrima, NSW	1,200
Do.	do.	Waurm Ponds, VIC	250
Do.	Cement Australia Pty Ltd. (Hanson Ltd. and Holcim Australia Pty Ltd.)	Brisbane, QLD	1,200
Do.	do.	Gladstone, QLD	1,700
Do.	do.	Railton, TAS	1,000
Do.	Cockburn Cement Ltd., 100%	Munster, 30 km south of Perth, WA	700

See footnotes at end of table.

TABLE 2—Continued
 AUSTRALIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(Thousand metric tons unless otherwise specified)

Commodity	Facilities, major operating companies, and major equity owners	Location of main facilities ^{1,2}	Annual capacity ⁶
Coal	Airly coal mine (Banpu Public Co. Ltd. through Centennial Coal Co. Ltd., 100%)	42 km northwest of Lithgow, NSW	1,900
Do.	Angus Place longwall coal mine ³ (Centennial Coal Co. Ltd., 50%, and SK Kores Australia Pty Ltd., 50%)	16 km northwest of Lithgow, NSW	4,000
Do.	Appin longwall coal mine [Illawarra Coal Holdings Pty Ltd. (South32 Ltd., 100%)]	40 northwest of Wollongong, NSW	8,800
Do.	Ashton open pit and underground coal mine (Yancoal Australia Ltd., 90%; Itochu Corp., 10%)	14 km northwest of Singleton, NSW	4,000
Do.	Austar underground coal mine [Yancoal Australia Ltd., 100% (Centennial Coal Co. Ltd., 100%)]	65 km west of Newcastle, NSW	2,000
Do.	Baal Bone coal mine [Oakbridge Pty Ltd., 74.1% (Glencore plc, 100%); Sumitomo Corp., 5%; Toyota Tsusho Mining (Australia) Pty Ltd. 4.75%; private, 14.44%]	24 km northwest of Lithgow, NSW	2,500
Do.	Bengalla open pit coal mine (Rio Tinto Ltd., 40%)	5 km west of Muswellbrook, NSW	8,600
Do.	Blackwater open pit coal mine (includes South Blackwater) [BHP Billiton Mitsubishi Alliance (BHP Billiton Ltd., 50%, and Mitsubishi Corp., 50%)]	195 km west of Rockhampton, QLD	14,000
Do.	Broadmeadow open pit and underground coal mine [BHP Billiton Mitsubishi Alliance, (BHP Billiton Ltd., 50%, and Mitsubishi Corp., 50%)]	30 km north of Moranbah, QLD	3,000
Do.	Bulga open pit coal mine [Oakbridge Pty Ltd. (Glencore plc, 68.25%; Nippon Steel Australia Pty. Ltd., 12.5%; Toyota Tsusho Mining (Australia) Pty Ltd., 4.38%; private, 13.3%)]	16 km southwest of Singleton, NSW	10,000
Do.	Burton open pit coal mine (Peabody Energy Corp., 95%, and Thiess Pty. Ltd., 5%)	150 km southwest of Mackay, QLD	5,800
Do.	Callide coal mine (Anglo Coal Pty Ltd., 100%)	120 km southwest of the Port of Gladstone, QLD	10,700
Do.	Caval Ridge open pit coal mine [BHP Billiton Mitsubishi Alliance (BHP Billiton Ltd., 50%, and Mitsubishi Corp., 50%)]	Central QLD	5,500
Do.	Carborough Downs underground coal mine (Vale SA, 90%)	Bowen basin, QLD	2,500
Do.	Charbon open pit and underground coal mine ⁷ (Banpu Public Co. Ltd. through Centennial Coal Co. Ltd., 95%; SK Energy Australia Pty Ltd., 5%)	Western coalfields near Kandos, NSW	1,300
Do.	Clarence underground coal mine [Banpu Public Co. Ltd. through Centennial Coal Co., 85%; SK Energy Australia Pty Ltd., 15%]	10 km east of Lithgow, NSW	2,600
Do.	Clermont coal mine [GS Coal Pty Ltd. (Glencore plc and Sumitomo Corp.)]	Central QLD	12,000
Do.	Commodore open pit coal mine [Roche Mining Pty. Ltd. [Intergen (Australia) Pty Ltd., 100%]	80 km southwest of Toowoomba, QLD	3,600
Do.	Coppabella open pit coal mine (Macarthur Coal Ltd., 73.3%, and others, 26.7%)	140 km southwest of Mackay, QLD	4,000
Do.	Cumnock No. 1 Colliery Mine (Cumnock No. 1 Colliery Pty Ltd., 100%)	28 km northwest of Singleton, NSW	3,000
Do.	Curragh open pit coal mine (Wesfarmers Ltd., 100%)	70 km east of Emerald, QLD	9,000
Do.	Dartbrook coal mine ³ (Anglo Coal Holdings Australia Ltd., 77.3%)	70 km north of Singleton, NSW	3,750
Do.	Daunia open pit coal mine [BHP Billiton Mitsubishi Alliance (BHP Billiton Ltd., 50%, and Mitsubishi Corp., 50%)]	central QLD	4,500
Do.	Dawson coal complex (includes Moura, Taroom, and Theodore) [Anglo American plc, 51%, and Mitsui & Co. (Australia) Ltd., 49%]	230 km west of Bundaberg, QLD	7,000
Do.	Dendrobium underground coal mine [Dendrobium Coal Pty Ltd., (South32 Ltd., 100%)]	15 km southwest of Wollongong, NSW	5,200
Do.	Donaldson open pit coal mine (Donaldson Coal Pty Ltd., 100%)	5 km southeast of Maitland, NSW	2,500
Do.	Drayton open pit coal mine [Anglo Coal Holdings Australia Ltd., 88.2%; Mitsui Coal Development Australia Pty. Ltd., 3.8%; Mitsui Mining (Australia) Pty. Ltd., 3%; others, 5%]	35 km northwest of Singleton, NSW	5,000
Do.	Duralie open pit coal mine (Gloucester Coal Ltd., 100%)	110 km of Newcastle, NSW	2,000
Do.	Elouera underground coal mine (Gujarat NRE Resources NL, 100%)	15 km southwest of Wollongong, NSW	2,000

See footnotes at end of table.

TABLE 2—Continued
AUSTRALIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(Thousand metric tons unless otherwise specified)

Commodity	Facilities, major operating companies, and major equity owners	Location of main facilities ^{1,2}	Annual capacity ³
Coal—Continued	Ensham-Yongala open pit coal mine [Idemitsu Kosan Co. Ltd., 85%; J-Power (Australia) Pty. Ltd., 10%; LG International (Australia) Pty Ltd., 5%]	40 km northeast of Emerald, QLD	9,000
Do.	Ewington II open pit coal mine (Griffin Coal Mining Co. Pty. Ltd., 100%)	8 km east of Collie, WA	1,000
Do.	Foxleigh open pit coal mine (Foxleigh Mining Pty Ltd., 100%)	Bowen basin, QLD	3,600
Do.	German Creek and German Creek East open pit and underground coal mines [Anglo American plc, 70%, and Mitsui & Co. (Australia) Ltd., 30%]	275 km west-northwest of Rockhampton, QLD	6,000
Do.	Glennies Creek longwall coal mine (CVRD Inco Ltd., 85%; Nippon Steel Australia Pty Ltd., 5%; POSCO Australia Pty Ltd., 5%; private, 5%)	12 km north of Singleton, NSW	2,800
Do.	Goonyella-Riverside open pit coal mines (BHP Billiton Ltd., 50%, and Mitsubishi Corp., 50%)	140 km southwest of Mackay, QLD	16,000
Do.	Gregory Crinum open pit and underground coal mine [BHP Billiton Mitsubishi Alliance (BHP Billiton Ltd., 50%, and Mitsubishi Corp., 50%)]	60 km north of Emerald, QLD	5,500
Do.	Hunter Valley Operations (includes Carrington Chestnut, Howick, Hunter Valley No. 1, Lemington, Riverview open pit coal mines) (Rio Tinto Ltd., 80%)	10 km west and 25 km north of Singleton, NSW	15,000
Do.	Hail Creek open pit coal mine (Rio Tinto Ltd., 82%; Nippon Steel Australia Pty Ltd., 8%; Marubeni Coal Pty. Ltd., 6.66%)	100 km west of Mackay, QLD	8,000
Do.	Hazelwood open pit coal mine (International Power Hazelwood, 100%)	150 km southeast of Melbourne, VIC	20,000
Do.	Integra coal complex ⁴ (includes Camberwell and glennies Creek [Glencore PLC, 68.4%; Toyota tsusho Corp.; 20.8%; JFE Holdings Inc., 3.6%; Nippon Steel & Sumitomo Metal Corp., 3.6%; POSCO, 3.6%])	10 km northwest of Singleton, NSW	4,000
Do.	Isaac Plains open pit coal mine ⁴ (Vale SA, 50%; Sumitomo Corp., 50%)	7 km southeast of Moranbah, QLD	1,600
Do.	Jellinbah East open pit coal mine (Queensland Coal Mine Management Pty. Ltd., 70%; Marubeni Coal Pty. Ltd., 15%; Sojitz Australia Ltd., 15%)	90 km east of Emerald, QLD	4,000
Do.	Kestrel underground coal mine (Rio Tinto Ltd., 80%, and Mitsubishi Corp., 20%)	40 km north-northeast of Emerald, QLD	5,500
Do.	Liddell open pit coal mine (Xstrata Coal Australia Pty. Ltd., 67.5%, and Mitsui Matushima Australia Pty. Ltd., 32.5%)	25 km northwest of Singleton, NSW	4,000
Do.	Loy Yang open pit coal mine (Loy Yang Power Ltd., 100%)	165 km east of Melbourne, VIC	30,000
Do.	Mondaloug underground coal mine (Centennial Coal Co. Ltd., 100%)	35 km southwest of Newcastle, NSW	4,500
Do.	Moorvale open pit coal mine (Macarthur Coal Ltd., 73.3%; CITIC Resources Australia Pty Ltd., 14%; Sojitz Australia Ltd., 7%; Nippon Steel Australia Pty Ltd., 2%)	10 km south of Coppabella, QLD	3,400
Do.	Moranbah North longwall coal mine (Anglo American plc., 88%, and Nippon Steel Australia Pty. Ltd., 5%)	150 km southwest of Mackay, QLD	5,800
Do.	Mount Arthur open pit coal mine (BHP Billiton Ltd., 100%)	5 km southwest of Muswellbrook, NSW	15,000
Do.	Mount Owen open pit coal mine (Glencore plc, 100%)	20 km northwest of Singleton, NSW	7,700
Do.	Mount Thorley open pit coal mine (Rio Tinto Ltd., 64%)	14 km southwest of Singleton, NSW	12,000
Do.	Muja open pit coal mine (The Griffin Coal Mining Co. Pty. Ltd., 100%)	18 km southeast of Collie, WA	2,000
Do.	Muswellbrook No. 2 open pit coal mine (Muswellbrook Coal Co., 100%)	4 km northeast of Muswellbrook, NSW	1,700
Do.	Myuna underground coal mine (Centennial Coal Co. Ltd., 100%)	35 km south of Newcastle, NSW	2,000
Do.	New Acland open pit coal mine (New Hope Corp. Ltd., 100%)	35 km northwest of Toowoomba, QLD	3,750
Do.	Newlands-Collinsville-Abbot Point open pit coal mine (Glencore plc, 55%; Itochu Corp., 35%; Sumitomo Corp., 10%)	130 km west of Mackay, QLD	15,000
Do.	Newstan Colliery longwall coal mine ⁴ (Centennial Coal Co. Ltd., 100%)	30 km southwest of Newcastle, NSW	4,000
Do.	North Goonyella underground coal mine (Peabody Energy Corp., 100%)	40 km north Moranbah, QLD	3,000
Do.	Norwich Park open pit coal mine (BHP Billiton Ltd., 50%, and Mitsubishi Corp., 50%)	85 km north-northeast of Emerald, QLD	5,000
Do.	Oaky Creek longwall and Alliance open pit coal mines (Glencore plc, 55%; Sumitomo Coal Australia Pty. Ltd., 25%; Itocho Corp., 20%)	300 km west-northwest of Rockhampton, QLD	9,500
Do.	Peak Downs open pit coal mine (BHP Billiton Ltd., 50%, and Mitsubishi Development Pty. Ltd., 50%)	145 km north of Emerald, QLD	9,000

See footnotes at end of table.

TABLE 2—Continued
AUSTRALIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(Thousand metric tons unless otherwise specified)

Commodity	Facilities, major operating companies, and major equity owners	Location of main facilities ^{1,2}	Annual capacity ⁶	
Coal—Continued	Poitrel open pit coal mine (BHP Billiton Ltd., 80% and Mitsui & Co. (Australia) Ltd., 20%)	Bowen basin, QLD	3,100	
Do.	Premier open pit coal mine (Wesfarmers Premier Coal Ltd., 100%)	10 km southeast of Collie, WA	4,000	
Do.	Ravensthorpe open pit coal mine (includes Ravensworth East (Xstrata Coal Australia Pty. Ltd., 100% of Ravensworth and 50% of Narama; Iluka Resources Ltd., 50% of Narama))	20 km northwest of Singleton, NSW	3,500	
Do.	Rixs Creek open pit coal mine (Bloomfield Colliers Pty. Ltd., 100%)	5 km northwest of Singleton, NSW	2,000	
Do.	Rolleston open pit coal mine (Glencore plc, 75%; Itochu Corp., 12.5%; Sumitomo Corp., 12.5%)	90 km south-southeast of Emerald, QLD	8,000	
Do.	Saraji open pit coal mine (BHP Billiton Ltd., 50%, and Mitsubishi Corp., 50%)	125 km north of Emerald, QLD	6,500	
Do.	South Walker Creek open pit and underground coal mine [BHP Billiton Ltd., 80%, and Mitsui & Co. (Australia) Ltd., 20%]	90 km southwest of Mackay, QLD	5,300	
Do.	Springvale underground coal mine (Banpu Public Co. Ltd. through Centennial Coal Co. Ltd., 50%; SK Kores Australia Pty Ltd., 50%)	16 km northwest of Lithgow, NSW	4,500	
Do.	Tahmoor longwall coal mine (includes Tahmoor North and Bargo [Austral Coal Ltd (Glencore plc, 100%)])	70 km southwest of Sydney, NSW	2,500	
Do.	Tarong-Meandu open pit coal mine (Rio Tinto Ltd., 100%)	85 km north of Toowoomba, QLD	7,000	
Do.	Ulan underground coal mine (Glencore plc, 90%, and Mitsubishi Corp., 10%)	45 km northwest of Mudgee, NSW	5,000	
Do.	United Collieries underground coal mine (Glencore plc, 95%, and private, 5%)	15 km west of Singleton, NSW	3,000	
Do.	Wambo open pit and underground coal mine (Peabody Energy Corp., 100%)	30 km from Singleton, NSW	6,000	
Do.	Warkworth coal mine (Rio Tinto Ltd., 44.46%)	15 km southwest of Singleton, NSW	1,300	
Do.	West Cliff longwall coal mine (South32 Ltd., 100%)	43 km northwest of Wollongong, NSW	2,300	
Do.	West Wallsend longwall coal mine (Glencore plc, 70%; Marubeni Coal Pty Ltd., 17%; private, 13%)	25 km southwest of Newcastle, NSW	2,500	
Do.	Yallourn open pit lignite mine (CLP Power Asia Ltd., 100%)	140 km southeast of Melbourne, VIC	18,000	
Cobalt:				
Mine	metric tons	Cause open pit nickel-cobalt mine ³ (OJSC MMC Norilsk Nickel, 100%)	50 km northwest of Kalgoorlie, WA	200
Do.	do.	Murrin Murrin open pit nickel-cobalt mine (Minara Resources Ltd., 60%, and Glencore plc, 40%)	60 km east of Leonora, WA	2,000
Do.	do.	Radio Hill underground nickel-cobalt mine (Fox Resources Ltd., 100%)	35 km south of Karratha, WA	200
Do.	do.	Ravensthorpe open pit mine (First Quantum Minerals Ltd., 100%)	155 km west of Esperance, WA	1,400
Refinery		Palmer nickel-cobalt refinery (Nickel Consolidated Pty Ltd., Nickel House Pty, and Nickel Process Pty)	Townsville, QLD	3
Copper:				
Mine, Cu content		Boddington open pit and underground gold mine (Newmont Mining Corp., 100%)	130 km southeast of Perth, WA	35
Do.		Cadia Valley open pit and underground gold-copper mine (includes Cadia East, Cadia Hill, ⁴ and Ridgeway) (Newcrest Mining Ltd., 100%)	25 km south-southwest of Orange, NSW	90
Do.		Cobar underground copper mine (Glencore plc, 100%)	12 km northwest of Cobar, NSW	30
Do.		DeGrussa underground gold-copper mine (Sandfire Resources NL, 100%)	150 km north of Meekatharra, WA	300
Do.		Eloise underground copper mine (FMR Investments Pty Ltd., 100%)	60 km southeast of Cloncurry, QLD	70
Do.		Ernest Henry open pit and underground copper-gold mine (Glencore plc, 100%)	35 km northeast of Cloncurry, QLD	115
Do.		Golden Grove underground zinc-copper mine [Minerals and Metals Group Australia Ltd. (China Minmetals Group, 100%)]	225 km east of Geraldton, WA	20
Do.		Hellyer underground zinc-lead-copper-silver mine (Bass Metals Ltd., 100%)	80 km south-southwest of Burnie, TAS	1
Do.		Lady Annie copper (solvent extraction-electrowinning) mine (CST Mining Group Ltd., 100%)	100 km north-northwest of Mount Isa, QLD	19
Do.		Leichhardt copper mine ³ (Cape Lambert Resources Ltd., 100%)	110 km northwest of Cloncurry, QLD	10
Do.		Mount Gordon open pit copper (solvent extraction-electrowinning) mine (Aditya Birla Minerals Ltd., 100%)	120 km north of Mount Isa, QLD	50
Do.		Mount Isa underground copper-lead-zinc-silver mine (also includes Enterprise, George Fisher, and Hilton Mines) (Glencore plc, 100%)	Mount Isa, QLD	190
Do.		Mount Lyell underground copper-gold mine [Copper Mines of Tasmania Pty Ltd. (Sterlite Industries (India) Ltd., 100%)]	2 km northeast of Queenstown, TAS	35
Do.		Nifty open pit copper (solvent extraction-electrowinning) mine (Aditya Birla Minerals Ltd., 100%)	200 km southeast of Marble Bar, WA	25

See footnotes at end of table.

TABLE 2—Continued
 AUSTRALIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(Thousand metric tons unless otherwise specified)

Commodity	Facilities, major operating companies, and major equity owners	Location of main facilities ^{1,2}	Annual capacity ⁶	
Copper:—Continued				
Mine, Cu content— Continued	Northparkes open pit and underground copper-gold mine (China Molybdenum Co. Ltd., 80%; Sumitomo Metal Mining Oceania Pty. Ltd., 13.3%; SC Mineral Resources Pty. Ltd., 6.7%)	30 km northwest of Parkes, NSW	90	
Do.	Olympic Dam underground copper-silver-gold-uranium mine [Olympic Dam Operations Pty. Ltd. (BHP Billiton Ltd., 100%)]	Roxby Downs, 80 km north of Woomera, SA	235	
Do.	Osborne underground copper-gold mine (Ivanhoe Australia Ltd., 100%)	120 km northeast of Boulia, QLD	22	
Do.	Peak underground gold-zinc-lead-copper-silver underground mine (includes New Cobar, New Occidental, and Perseverance) (New Gold Inc., 100%)	8 km south of Cobar, NSW	3	
Do.	Prominent Hill open pit and underground copper-gold mine (OZ Minerals Ltd., 100%)	650 km northwest of Adelaide, SA	140	
Do.	Rosebery underground zinc-lead-silver-copper-gold mine [Minerals and Metals Group Australia Ltd. (China Minmetals Nonferrous Metals Co. Ltd., 100%)]	35 km north of Queenstown, TAS	2	
Do.	Tritton underground mine (Straits Resources Ltd., 100%)	Nyngan, NSW	30	
Smelter	Mount Isa copper smelter (Glencore plc, 100%)	Mount Isa, QLD	250	
Do.	Olympic Dam copper smelter [Olympic Dam Operations Pty. Ltd., (BHP Billiton Ltd., 100%)]	Roxby Downs, 80 km north of Woomera, SA	70	
Refinery	Olympic Dam copper refinery [Olympic Dam Operations Pty. Ltd., (BHP Billiton Ltd., 100%)]	Roxby Downs, 80 km north of Woomera, SA	235	
Do.	Townsville copper refinery (Glencore plc, 100%)	Townsville, QLD	300	
Diamond	thousand carats	Argyle underground mine; previously open pit mine (Rio Tinto Ltd., 100%)	120 km southwest of Kununurra, WA	20,000
Do.	do.	Ellendale Mine ³ (includes pipes 4 and 9) (Kimberley Diamond Ltd., 100%)	130 east southeast of Derby, WA	700
Do.	do.	Ellendale 9 North Mine ³ (Blina Diamond NL, 100%)	140 east of Derby, WA	500
Diatomite	Barraba open pit diatomite mine (Australia Diatomite Mining Pty. Ltd., 100%)	85 km north-northwest of Tamworth, NSW	25	
Do.	Mount Sylvia Diatomite Pty Ltd.	Mount Sylvia Mine, 35 km southeast of Toowoomba, QLD	NA	
Do.	Greenvale Silicon Pty Ltd.	Conjuboy Mine, 45 km northwest of Greenvale, QLD	NA	
Dolomite	Ardrossan metallurgical dolomite quarry (OneSteel Ltd., 100%)	Northern York Peninsula, SA	650	
Do.	Cookes Hill Mine (includes Nickol River and Warrawoona) (Haoma Mining NL, 100%)	Near Port Hedland, WA	400	
Feldspar	Broken Hill open pit feldspar mine (includes Bakers, Lady Beryl, and Spar Ridge) (Unimin Australia Ltd., 100%)	42 km southwest of Broken Hill, NSW	15	
Garnet	Port Gregory open pit industrial garnet mine (GMA Garnet Pty. Ltd., 100%)	100 km north of Geraldton, WA	400	
Gas:				
Condensate	thousand 42-gallon barrels per day	North West Shelf gas operations {Woodside Petroleum Pty. Ltd., [BHP Petroleum Pty. Ltd., BP Australia Holdings Ltd., Chevron Asiatic Ltd., Japan Australia LNG (MMI) Pty. Ltd., Shell Development (Australia) Pty. Ltd., and Woodside Petroleum Ltd., 16.67% each]}	130 km offshore Dampier, WA	60
Natural	million cubic meters per day	do.	do.	20
Liquefied natural	million metric tons	do.	Four-train liquefaction plant, Burrup Peninsula, WA	12
Gold:				
Mine	kilograms	Agnew/Lawlers open pit and underground gold mine (Gold Fields Ltd., 100%)	23 km west of Leinster, WA	8,600
Do.	do.	Boddington open pit and underground gold mine (Newmont Mining Corp., 100%)	130 km southeast of Perth, WA	31,000
Do.	do.	Bronzewing underground gold mine (includes Mount McClure, Venus, Success, Cockburn, Corboys, Mount Joel) (Audax Resources Ltd., 100%)	65 km northeast of Leinster, WA	9,000

See footnotes at end of table.

TABLE 2—Continued
 AUSTRALIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(Thousand metric tons unless otherwise specified)

Commodity		Facilities, major operating companies, and major equity owners	Location of main facilities ^{1,2}	Annual capacity ^c
Gold:—Continued				
Mine— Continued	kilograms	Burnside open pit mines (includes Union Reefs, Brocks Creek, North Point, Princess Louise, Rising Tide, Zapopan, Fountain Head) (Crocodile Gold Corp., 100%)	Pine Creek, NT	6,500
Do.	do.	Cadia Valley open pit and underground gold-copper mine (includes Cadia East, Cadia Hill, and Ridgeway) (Newcrest Mining Ltd., 100%)	25 km south-southwest of Orange, NSW	25,000
Do.	do.	Doolgunna open pit and underground gold-copper mine (includes DeGrussa) (Sandfire Resources NL, 100%)	140 km north of Meekatharra, WA	270
Do.	do.	Ernest Henry open pit copper-gold mine (Glencore plc, 100%)	35 km northeast of Cloncurry, QLD	3,000
Do.	do.	Garden Well gold mine (Regis Resources Ltd., 100%)	350 km northeast of Kalgoorlie, WA	5,200
Do.	do.	Granny Smith open pit gold mine (includes Wallaby) (Gold Fields., 100%)	20 km south of Laverton, WA	16,000
Do.	do.	Gwalia underground gold mine (St Barbara Ltd., 100%)	3 km south of Leonora, WA	2,600
Do.	do.	Henty underground gold-silver mine (Unity Mining Ltd., 100%)	30 km north of Queenstown, TAS	3,700
Do.	do.	Hillgrove Mine (Straits Resources Ltd., 100%)	25 km east of Armidale, NSW	650
Do.	do.	Jundee-Nimary open pit and underground gold mine (Newmont Mining Corp., 100%)	45 km northeast of Wiluna, WA	12,000
Do.	do.	Kalgoorlie open pit and underground gold mine [Kalgoorlie Consolidated Gold Mine Pty Ltd. (Barrick Gold Australia, 50%, and Newmont Mining Corp., 50%)]	Southeast corner of the Kalgoorlie Boulder Township, WA	25,000
Do.	do.	Kanowna Belle underground gold mine (Barrick Gold Corp., 100%)	18 km northeast of Kalgoorlie, WA	7,000
Do.	do.	Moolart Well gold mine (Regis Resources Ltd., 100%)	100 km north of Laverton, WA	3,000
Do.	do.	Mount Lyell underground copper-gold mine [Sterlite Industries (India) Ltd., 100%]	2 km northeast of Queenstown, TAS	1,000
Do.	do.	Mount Magnet open pit and underground gold mine (includes Hill 50 and Star) (Ramelins Resources Ltd., 100%)	2 km from Mount Magnet, WA	8,500
Do.	do.	Norseman underground gold mine ³ (Norseman Gold Plc, 100%)	Norseman, WA	3,700
Do.	do.	Northparkes open pit and underground copper-gold mine (China Molybdenum Ltd., 80%, and Sumitomo Metal Mining Oceania Pty. Ltd., 20%)	30 km north of Parkes, NSW	1,550
Do.	do.	Osborne underground copper-gold mine (Ivanhoe Australia Ltd., 100%)	120 km northeast of Boulia, QLD	1,000
Do.	do.	Olympic Dam underground copper-silver-gold-uranium mine [Olympic Dam Operations Pty. Ltd. (BHP Billiton Ltd., 100%)]	Roxby Downs, 80 km north of Woomera, SA	1,500
Do.	do.	Paddington open pit and underground gold operation (Norton Gold Fields Ltd. (Zijin Mining Group Co. Ltd., 89%))	35 km north of Kalgoorlie, WA	5,000
Do.	do.	Pajingo underground gold mine (includes Vera-Nancy) (Evolution Mining Ltd., 100%)	60 km south-southeast of Charters Towers, QLD	6,400
Do.	do.	Plutonic open pit and underground gold mine (Barrick Gold Corp., 100%)	180 km northeast of Meekatharra, WA	8,000
Do.	do.	Prominent Hill open pit copper-gold mine (OZ Minerals Ltd., 100%)	650 km northwest of Adelaide, SA	2,200
Do.	do.	Ravenswood open pit mine (includes Nolans, Sarsfield, and Mount Wright) (Resolute Mining Ltd., 100%)	100 km south of Townsville, QLD	3,000
Do.	do.	Rosebery underground zinc-lead-silver-copper-gold mine [Minerals and Metals Group Australia Ltd. (China Minmetals Nonferrous Metals Co. Ltd., 100%)]	35 km north of Queenstown, TAS	1,000
Do.	do.	Saint Ives open pit and underground gold mine (Gold Fields Ltd., 100%)	75 km south-southeast of Kalgoorlie, WA	15,000
Do.	do.	Selwyn underground copper-gold mine (Barrick Gold Corp., 100%)	160 km southeast of Mount Isa, QLD	700
Do.	do.	Stawell underground gold mine (Perseverance Corp. Ltd., 100%)	250 km west of Melbourne, VIC	3,000
Do.	do.	Sunrise Dam open pit gold mine (includes Cleo Mine) (AngloGold Ashanti Ltd., 100%)	55 km south of Laverton, WA	15,000
Do.	do.	Tanami open pit gold mine (includes Central Desert Joint Venture) (Newmont Gold Corp., 100%)	650 km northwest of Alice Springs, NT	15,000
Do.	do.	Telfer copper and gold mine (Newcrest Mining Ltd., 100%)	400 km east southeast of Port Hedland, WA	15,000
Do.	do.	Trident gold mine (Alacer Gold Corp., 100%)	Higginsville, WA	5,000

See footnotes at end of table.

TABLE 2—Continued
 AUSTRALIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(Thousand metric tons unless otherwise specified)

Commodity	Facilities, major operating companies, and major equity owners	Location of main facilities ^{1,2}	Annual capacity ^c
<u>Gold:—Continued</u>			
Mine— Continued	kilograms o. Tropicana gold mine (AngloGold Ashanti Australia Pty Ltd., 70% and Independence Group NL 30%)	330 km northeast of Kalgoorlie, WA	16,400
Do.	do. Wattle Dam gold mine ³ (Tychean Resources Ltd., 100%)	70 km south of Kalgoorlie, WA	3,000
Do.	do. Wiluna open pit and underground gold mine (Apex Minerals NL, 100%)	7 km south of Wiluna, WA	3,300
Smelter	do. Gidji Roaster gold smelter (Kalgoorlie Consolidated Gold Mines Pty. Ltd., 100%)	Kalgoorlie, WA	24,300
Refinery	do. Perth Mint Refinery [Gold Corp. (Government of Western Australia, 100%)]	Newburn, WA	400,000
Gypsum	Gypsum Resources Australia Pty. Ltd., 100%	Lake MacDonnell open pit gypsum mine, near Point Thevenard, SA	1,400
Do.	Dredging of gypsum from surface of Lake MacLeod (Rio Tinto Ltd., 68.4%)	Lake MacLeod, WA	900
<u>Iron and steel:</u>			
Iron ore	Channar open pit iron ore mine [Hamersley Iron Pty. Ltd., 60% (Rio Tinto Ltd., 100%), and China Iron and Steel Industry & Trade Group Corp. (SINOSTEEL) (a China state-owned company), 40%]	70 km south of Tom Price, WA	11,000
Do.	Cloudbreak iron ore mine (includes Chicester Range, Christmas Creek, WhiteKnight, Mount Lewin, Mount Nicholas, and Flinders Mines) (Fortescue Metals Group Ltd., 100%)	Chichester Ranges, East Pilbara, WA	55,000
Do.	Cockatoo Island open pit iron ore mine (BHP Billiton Ltd., 100%)	130 km north northeast of Derby, WA	1,500
	Eastern Range open pit iron ore mine [Hamersley Iron Pty. Ltd., 54% (Rio Tinto Ltd., 100%), and Shanghai Baosteel Group Corp., 46%]	10 km east of Paraburdoo, WA	10,000
Do.	Extension Hill open pit iron ore mine (Mount Gibson Iron Ltd., 100%)	85 km of Perenjori, WA	3,000
Do.	Hamersley Operations (includes Brockman 2, Brockman 4, Marandoo, Mount Tom Price, Nammuldi, Paraburdoo, Western Turner Syncline, and Yandicoogina open pit iron ore mines) (Rio Tinto Ltd., 100%)	30 km to 85 km northeast, northwest, and south of Tom Price, WA	140,000
Do.	Hope Downs 1 Mine [Hope Downs Iron Ore Pty Ltd. (Hancock Prospecting Pty Ltd. 100%), 50%, and Rio Tinto Ltd., 50%]	75 km northwest of Newman, Pilbara region, WA	30,000
Do.	Hope Downs 4 Mine [Hope Downs Iron Ore Pty Ltd. (Hancock Prospecting Pty Ltd. 100%), 50%, and Rio Tinto Ltd., 50%]	Pilbara region, WA	15,000
Do.	Jimblebar open pit iron ore mine (includes ore from Wheelarra JV) {BHP Iron Ore (Jimblebar) Pty Ltd, 85% [BHP Billiton Ltd., 100%]; ITOCHU Minerals and Energy of Australia, 8%; Mitsui Iron Ore Corp., 7%}	40 km east of Newman, WA	20,000
Do.	JW4 open pit (ore blended with that of Yandi Mine) (BHP Billiton Ltd., 68%; JFE Steel Australia 20%; ITOCHU Minerals and Energy of Australia, 6.4%; Mitsui Iron Ore Corp., 5.6%)	Pilbara region, WA	NA
Do.	Karara open pit iron ore mine (Anshan Iron and Steel Group Corp., 50%, and Gindalbie Metals Ltd., 50%)	110 km south of Yalgoo, WA	8,000
Do.	Koolan Island open pit iron ore mine (Mount Gibson Iron Ltd., 100%)	140 north of Derby, WA	4,000
Do.	Koolyanobbing Central open pit iron ore mine (Portman Ltd., 100%)	50 km north-northeast of Southern Cross, WA	6,000
Do.	Mount Goldsworthy mining associates joint venture (includes the Area C, the Nimingarra, and the Yarrie ³ Mines) [BHP Billiton Minerals Pty Ltd., 85%; ITOCHU Minerals & Energy of Australia Pty Ltd., 8%; Mitsui Iron Ore Corp. Pty. Ltd., 7%]	180 km east of Port Hedland, Pilbara region, WA	42,000
Do.	Mount Gould open pit iron ore mine (Unimin Australia Ltd., 100%)	160 km west of Meekatharra, WA	6,000
Do.	Mount Newman open pit iron ore mine (includes Mount Whaleback, orebodies 18, 24, 25, 29, 30 and 35) {BHP Billiton Minerals Pty Ltd., 85%, [BHP Billiton Ltd., 100%]; Mitsui ITOCHU Iron Pty Ltd., 10% [Mitsui & Co. (Australia) Ltd., 100%]; ITOCHU Minerals and Energy of Australia, 5% [ITOCHU Corp., 100%]}	Within 13 km of Newman, Pilbara region, WA	42,000

See footnotes at end of table.

TABLE 2—Continued
 AUSTRALIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(Thousand metric tons unless otherwise specified)

Commodity	Facilities, major operating companies, and major equity owners	Location of main facilities ^{1,2}	Annual capacity ⁶
Iron and steel:—Continued			
Iron ore—Continued	Pannawonica (includes Mesa A and J) open pit iron ore mine [Robe River Iron Associates (Rio Tinto Ltd., 53%; Mitsui & Co. (Australia) Ltd., 33%; Nippon Steel Australia Pty. Ltd., 10.5%; Sumitomo Metal Australia Pty. Ltd., 3.5%]	130 km south-southwest of Dampier, Pilbara region, WA	35,000
Do.	Sino Iron iron ore mine (CITIC Pacific Mining Management Pty Ltd., 80% and China Metallurgical Group Corp., 20%)	Cape Preston, 100 km southwest of Karratha, Pilbara region, WA	2,000
Do.	Savage River open pit iron ore mine (Grange Resources Ltd., 100%)	100 km southwest of Burnie, TAS	2,400
Do.	Tallering Peak open pit iron ore mine (Mount Gibson Iron Ltd., 100%)	120 northeast of Geraldton, WA	3,000
Do.	West Angelas open pit iron ore mine {Robe River Iron Associates, [Rio Tinto Ltd., 53%; Mitsui & Co. (Australia) Ltd., 33%; Nippon Steel Australia Pty. Ltd., 10.5%; Sumitomo Metal Australia Pty. Ltd., 3.5%]	110 km west of Newman, Pilbara region, WA	29,400
Do.	Whyalla open pit iron ore mines (Arrium Steel Ltd., 100%)	270 km northwest of Adelaide, SA	2,600
Do.	Yandi open pit iron ore mine (includes ore from JW4 JV) {BHP Billiton Minerals Pty Ltd., 85%, [BHP Billiton Ltd., 100%]; ITOCHU Minerals & Energy of Australia Pty Ltd., 8%; Mitsui Iron Ore Corp. Pty. Ltd., 7%}	92 km north of Newman, Pilbara region, WA	47,000
Pig iron	Hismelt pig iron plant [Hismelt Corp. Pty Ltd. (Rio Tinto Ltd., 60%; Nucor Corp., 25%; Mitsubishi Corp., 10%; and Shougang Corp., 5%)]	Kwinana, WA	800
Steel	Laverton Steel Mill (Arrium Steel Ltd., 100%)	Laverton, Melbourne, VIC	700
Do.	Port Kembla steelworks (Blue Scope Steel Ltd., 100%)	Port Kembla, NSW	2,600
Do.	Smorgon Steel Group Ltd.	Laverton, Melbourne, VIC	700
Do.	do.	Waratch, NSW	285
Do.	Sydney Steel Mill (Arrium Steel Ltd., 100%)	Sydney, NSW	600
Do.	Whyalla steelworks (Arrium Steel Ltd., 100%)	Whyalla, SA	1,200
Kaolin	Axedale Clays open pit kaolin mine (E Clay Pty Ltd., 100%)	18 km east of Bendigo, VIC	50
Do.	Pittong open pit kaolin mine (Imerys Minerals Australia Pty Ltd., 100%)	35 km southwest of Ballarat, VIC	110
Do.	Skardon River open pit kaolin mine (Queensland Kaolin Pty. Ltd., 96.6%, and private, 3.4%)	85 km north of Weipa, QLD	150
Lead:			
Mine, lead content	Angas zinc mine (Terramin Australia Ltd., 100%)	2 km from Strathalbyn, SA	10
Do.	Broken Hill underground silver-zinc-lead mine (Shenzhen Zhongjin Lingnan Nonfemet Co. Ltd., 50.1%, and Perilya Ltd., 49.9%)	Broken Hill, NSW	90
Do.	Cannington underground silver-lead-zinc mine (BHP Billiton Ltd., 100%)	85 km southwest of McKinlay, QLD	265
Do.	Century open pit zinc-silver-lead mine (MMG Ltd., 100%)	250 km north of Mount Isa, QLD	90
Do.	Endeavor underground zinc-silver-lead mine (CBH Resources Ltd., 100%)	40 km northwest of Cobar, NSW	45
Do.	Hellyer underground zinc-lead-copper-silver mine ³ (Bass Metals Ltd., 100%)	80 km south-southwest of Burnie, TAS	44
Do.	Mount Isa underground copper-lead-zinc-silver mine (also includes Enterprise, George Fisher, and Hilton Mines) (Glencore plc, 100%)	Mount Isa, QLD	150
Do.	Rosebery underground zinc-lead-silver-copper-gold mine [Minerals and Metals Group Australia Ltd. (China Minmetals Nonferrous Metals Co. Ltd., 100%)]	5 km north of Queenstown, TAS	25
Smelter	Mount Isa smelter (Glencore plc, 100%)	Mount Isa, QLD	240
Do.	Port Pirie smelter (Nyrstar Corp., 100%)	5 km north of Queenstown, TAS	235
Magnesite	Kunwarara open pit magnesite mine (includes Marlborough) [Queensland Magnesia Pty Ltd., (Sibelco Group, 100%)]	70 km northwest of Rockhampton, QLD	3,000
Do.	Salt Creek open pit mine (Agricola Mining Pty Ltd., 100%)	70 km southeast of Meningie, SA	NA
Do.	Thuddungra Mine (Orind Australia Pty Ltd., 100%)	38 km northwest of Young, NSW	80

See footnotes at end of table.

TABLE 2—Continued
AUSTRALIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(Thousand metric tons unless otherwise specified)

Commodity	Facilities, major operating companies, and major equity owners	Location of main facilities ^{1,2}	Annual capacity ^c
Manganese:			
Mine, concentrate	Bootu Creek open pit manganese mine (OM Holding Ltd., 100%)	110 km north of Tennant Creek, NT	600
Do.	Groote Eylandt open pit manganese mine [Groote Eylandt Mining Co. (BHP Billiton Ltd., 60%, and Anglo American Corp., 40%)]	Groote Eylandt, NT	3,100
Do.	Woodie Woodie open pit manganese mine (includes Bells and East Pilbara leases) [Pilbara Manganese Pty Ltd. (Consolidated Minerals Ltd., 100%)]	400 km southeast of Port Hedland, WA	1,000
Alloys	Bell Bay Smelter [Tasmanian Electro Metallurgical Co. Pty. Ltd., (BHP Billiton Ltd., 100%)]	Bell Bay, TAS	250
Mineral sands	Broken Hill region mines (Cristal Australia Pty Ltd., 100%)	120 km north of Mildura, NSW	NA
Do.	Murray Basin heavy-mineral sands mine (Iluka Resources Ltd., 100%)	80 km southeast of Mildura, VIC	NA
Do.	Perth Basin heavy-mineral sands mine (Iluka Resources Ltd., 100%)	260 km north of Perth, WA	NA
Do.	North Capel open pit heavy-mineral sands mine (Iluka Resources Ltd., 100%)	7 km north of Capel, WA	NA
Do.	North Stradbroke Island heavy-mineral sands dredge (Stradbroke Rutile Pty. Ltd., 100%)	35 km east of Brisbane, QLD	NA
Do.	Tiwest Joint Venture heavy-mineral sands dredge (Exxaro Resources Ltd., 50%, and Tronox Inc., 50%)	180 km north of Perth, WA	NA
Nickel:			
Mine, Ni content	Avebury nickel mine ³ (includes Bison, North Avebury, Saxon, and West Viking) [Minerals and Metals Group Australia Ltd. (China Minmetals Nonferrous Metals Co. Ltd., 100%)]	Near Zeehan, TAS	7
Do.	Black Swan underground nickel mine ³ (includes Silver Swan) (OJSC MMC Norilsk Nickel, 100%)	53 km northeast of Kalgoorlie, WA	10
Do.	Carnilya Hill open pit mine (Mincor Resources NL, 70%, and View Resources Ltd., 30%)	25 km northeast of Kambalda, WA	5
Do.	Cawse open pit nickel-cobalt mine ³ (OJSC MMC Norilsk Nickel, 100%)	50 km northeast of Kalgoorlie, WA	9
Do.	Cosmos open pit nickel mine ³ (Glencore plc, 100%)	50 km north of Leinster, WA	13
Do.	Flying Fox underground mine (Western Areas NL, 100%)	108 km south of Marvel Loch, WA	15
Do.	Kambalda underground nickel mines (Palmary Enterprises Ltd., 100%)	5 km south of Kambalda, WA	35
Do.	Lake Johnson underground nickel mine ³ (includes Maggie Hays, Maggie Hays Lake, and Emily Ann) (OJSC MMC Norilsk Nickel, 100%)	130 km west of Norseman, WA	12
Do.	Lanfranchi underground mine (includes Deacon, Schmitz, Tramway, and Winner) (Panoramic Resources Ltd., 100%)	42 km south of Kambalda, WA	10
Do.	Leinster open pit and underground nickel mines ³ (BHP Billiton Ltd., 100%)	10 km north of Leinster, WA	44
Do.	Long underground mine (Independence Group NL, 100%)	Near Kambalda East, WA	10
Do.	Miitel underground nickel mine (includes Redross and Mariners) (Mincor Resources NL, 100%)	70 km south of Kambalda, WA	10
Do.	Mount Keith open pit nickel mine (includes the Cliffs, Jericho, Venus, and Yakabindie deposits) (BHP Billiton Ltd., 100%)	70 km south-southeast of Wiluna, WA	40
Do.	Murrin Murrin open pit nickel-cobalt mine (Minara Resources Ltd., 60%, and Glencore plc, 40%)	60 km east of Leonora, WA	34
Do.	Radio Hill underground nickel-cobalt mine (Fox Resources Ltd., 100%)	35 km south of Karratha, WA	4
Do.	Ravensthorpe open pit mine ³ (First Quantum Minerals Ltd., 100%)	155 km west of Esperance, WA	39
Do.	Savannah underground mine (Panoramic Resources Ltd., 100%)	120 km north of Halls Creek, WA	8
Do.	Spotted Quoll nickel mine (includes Tim King and Willy Willy) (Western Areas NL, 100%)	114 km south of Marvel Loch, WA	10
Do.	Waterloo underground nickel mine (includes Amorac) (OJSC MMC Norilsk Nickel, 100%)	90 km north of Leonora, WA	5
Smelter	Kalgoorlie nickel smelter (BHP Billiton Ltd., 100%)	Kalgoorlie, WA	100
Refinery	Kwinana nickel refinery (BHP Billiton Ltd., 100%)	Kwinana, WA	67
Do.	Murrin Murrin nickel refinery (Minara Resources Ltd., 60%, and Glencore plc, 40%)	Murrin Murrin, WA	45
Do.	Yabulu nickel-cobalt refinery (Nickel Consolidated Pty Ltd., Nickel House Pty Ltd., and Nickel Process Pty Ltd.)	Townsville, QLD	40

See footnotes at end of table.

TABLE 2—Continued
AUSTRALIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(Thousand metric tons unless otherwise specified)

Commodity		Facilities, major operating companies, and major equity owners	Location of main facilities ^{1,2}	Annual capacity ⁶
Opal		Many small producers	Andamooka and Coober Pedy areas, SA; Lightning Ridge area, NSW	NA
Petroleum	thousand 42-gallon barrels per day	Exxon Mobil Corp., 100%	Altona Refinery, VIC	120
Do.	do.	Bulwer Island Refinery [BP Amoco Refinery (Bulwer Island) Pty. Ltd., 100%]	Bulwer Island, QLD	69
Do.	do.	Geelong Refinery [Shell Refining (Australia) Pty. Ltd., 100%]	Geelong, VIC	110
Do.	do.	Kurnell Refinery (Caltex Australia Ltd., 100%)	Kurnell, NSW	114
Do.	do.	Kwinana Refinery [BP Amoco Refinery (Kwinana) Pty. Ltd., 100%]	Kwinana, WA	138
Do.	do.	Lytton Refinery (Caltex Australia Ltd., 100%)	Lytton, QLD	106
Phosphate rock		Phosphate Hill-Duchess open pit phosphate mine (Incitec Pivot Ltd., 100%)	140 km northwest of Mount Isa, QLD	2,200
Rare earths, rare-earth oxide equivalent	metric tons	Mount Weld Mine (Lynas Corp. Ltd.)	Mount Weld, WA	8,000
Salt		Dampier Salt, solar evaporation salt pans (Rio Tinto Ltd., 68.4%)	Near Dampier, WA	4,000
Do.		Lake MacLeod solar salt and gypsum evaporation pans (Rio Tinto Ltd., 68.4%)	65 km north of Carnarvon, WA	900
Do.		Port Hedland solar salt fields (Rio Tinto Ltd., 68.4%)	Port Hedland, WA	3,000
Silica		Itochu Corp., 50%, and Tochu Corp., 50%	Kemerton silica sands dredge, 25 km northeast of Bunbury, WA	450
Silver:				
Mine, Ag content	kilograms	Broken Hill underground silver-zinc-lead mine (Shenzhen Zhongjin Lingnan Nonfemet Co. Ltd., 50.1%, and Perilya Ltd., 49.9%)	Broken Hill, NSW	81,200
Do.	do.	Cannington underground silver-lead-zinc mine (BHP Billiton Ltd., 100%)	85 km southwest of McKinlay, QLD	700,000
Do.	do.	Century open pit zinc-silver-lead mine [Minerals and Metals Group Australia Ltd. (China Minmetals Nonferrous Metals Co. Ltd., 100%)]	250 km north of Mount Isa, QLD	3,000
Do.	do.	Pasminco Ltd., 100%	Cockle Creek silver smelter, NSW	85,000
Do.	do.	Endeavor underground zinc-silver-lead mine (CBH Resources Ltd., 100%)	40 km northwest of Cobar, NSW	35,000
Do.	do.	Hellyer underground zinc-lead-copper-silver mine (Intec Ltd., 50%, and Polymetals Mining Services Pty Ltd., 50%)	80 km south-southwest of Burnie, TAS	60,000
Do.	do.	Henty underground gold-silver mine (Barrick Gold Ltd., 100%)	30 km north of Queenstown, TAS	1,100
Do.	do.	Mount Isa underground copper-lead-zinc-silver mine (also includes Enterprise, George Fisher, and Hilton Mines) (Glencore plc, 100%)	Mount Isa, QLD	375,000
Do.	do.	Olympic Dam underground copper-silver-gold-uranium mine [Olympic Dam Operations Pty. Ltd. (BHP Billiton Ltd., 100%)]	Roxby Downs, 80 km north of Woomera, SA	27,000
Do.	do.	Peak underground gold-zinc-lead-copper-silver underground mine (includes New Cobar, New Occidental, and Perseverance Mines), (GoldCorp Inc., 100%)	8 km south of Cobar, NSW	6,000
Do.	do.	Rosebery underground zinc-lead-silver-copper-gold mine [Minerals and Metals Group Australia Ltd. (China Minmetals Nonferrous Metals Co. Ltd., 100%)]	5 km north of Queenstown, TAS	35,000
Smelter	do.	Port Pirie smelter (Nyrstar Corp., 100%)	do.	450,000
Refinery	do.	Perth Refinery [AGR Management Services Ltd. (Australian Gold Alliance Pty Ltd., 40%; Western Australian Mint, 40%; and Johnson Matthey (Australian) Ltd., 20%]	Newburn, WA	NA
Spodumene		Greenbushes open pit and underground tantalite-spodumene mine {Windfield Holding Pty Ltd. [Chengdu Tianqi Industry (Group) Co. Ltd., 100%]}	70 km southeast of Bunbury, WA	740
Do.		Mount Cattlin spodumene mine ³ (Galaxy Resources Ltd., 100%)	2 km north of Ravensthorpe, WA	140
Talc		Three Springs open pit talc mine (Imerys SA, 100%)	330 km north of Perth, WA	150

See footnotes at end of table.

TABLE 2—Continued
 AUSTRALIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(Thousand metric tons unless otherwise specified)

Commodity		Facilities, major operating companies, and major equity owners	Location of main facilities ^{1,2}	Annual capacity ³
Tantalum, tantalite, Ta ₂ O ₅ content	metric tons	Greenbushes open pit and underground tantalite-spodumene mine ³ (Global Advanced Metals Ltd., 100%)	70 km southeast of Bunbury, WA	NA
Do.	do.	Bald Hill tantalite mine ³ (Haddington Resources Ltd., 100%)	60 km southeast of Kambalda, WA	NA
Do.	do.	Wodgina open pit tantalite mine ³ (Global Advanced Metals Ltd., 100%)	70 km southeast of Bunbury, WA	NA
Tin:				
Mine, Sn content	do.	Collingwood underground tin mine ³ (Metals X Ltd., 100%)	35 km south of Cooktown, QLD	3,000
Do.	do.	Greenbushes open pit and underground tantalite-spodumene mine ³ (Global Advanced Metals Ltd., 100%)	70 km southeast of Bunbury, WA	1,000
Do.	do.	Mount Bischoff open pit mine ³ (Metals X Ltd., 50%; L'sea Resources International Holdings Ltd. and YT Parksong Australia Holdings Pty Ltd., 50%)	55 km southwest of Burnie, TAS	6,000
Do.	do.	Renison Bell underground tin mine (Metals X Ltd., 50%; L'sea Resources International Holdings Ltd. and YT Parksong Australia Holdings Pty Ltd., 50%)	136 km south of Burnie, TAS	4,000
Smelter	do.	Greenbushes smelter ³ (Global Advanced Metals Ltd., 100%)	70 km southeast of Bunbury, WA	1,000
Tungsten, W content	do.	Kara magnetite and scheelite mine (Tasmania Mines Ltd., 100%)	30 km south of Burnie, TAS	50
Do.	do.	Mount Carbine tungsten mine (Carbine Tungsten Ltd., 100%)	75 km west of Cairns, QLD	4,000
Do.	do.	Wolfram Camp molybdenum-tungsten mine (Almonty Industries Inc., 100%)	85 km west of Cairns, QLD	500
Uranium, U ₃ O ₈ content	do.	Beverley in situ leach uranium operation (Heathgate Resources Pty. Ltd., 100%)	300 km northeast of Port Augusta, SA	1,000
Do.	do.	Honeymoon uranium mine (UraniumOne Inc., 100%)	75 km northwest of Broken Hill, SA	400
Do.	do.	Olympic Dam underground copper-silver-gold-uranium mine [Olympic Dam Operations Pty. Ltd. (BHP Billiton Ltd., 100%)]	Roxby Downs, 80 km north of Woomera, SA	4,400
Do.	do.	Ranger open pit uranium mine (Energy Resources of Australia Ltd., 100%)	230 km east of Darwin, NT	5,000
Vanadium, V ₂ O ₅ content	do.	Windimurra open pit mine vanadium ³ (Precious Metals Australia Ltd., 90%, and Noble Group Ltd., 10%)	100 km east-southeast of Mount Magnet, WA	8
Zinc:				
Mine, Zn content		Angas zinc mine (Terramin Australia Ltd., 100%)	2 km from Strathalbyn, SA	24
Do.		Broken Hill underground silver-zinc-lead mine (Shenzhen Zhongjin Lingnan Nonfemet Co. Ltd., 50.1%, and Perilya Ltd., 49.9%)	Broken Hill, NSW	360
Do.		Cannington underground silver-lead-zinc mine (BHP Billiton Ltd., 100%)	85 km southwest of McKinlay, QLD	100
Do.		Century open pit zinc-silver-lead mine [Minerals and Metals Group Australia Ltd. (China Minmetals Group, 100%)]	250 km north of Mount Isa, QLD	500
Do.		Endeavor underground zinc-silver-lead mine (CBH Resources Ltd., a subsidiary of Toho Zinc Co. Ltd. of Japan, 100%)	40 km northwest of Cobar, NSW	125
Do.		Golden Grove underground zinc-copper mine [Minerals and Metals Group Australia Ltd., (China Minmetals Group, 100%)]	225 km east of Geraldton, WA	150
Do.		Hellyer underground zinc-lead-copper-silver mine ³ (Intec Ltd., 50%, and Polymetals Mining Services Pty Ltd., 50%)	80 km south-southwest of Burnie, TAS	130
Do.		Jaguar underground mine (Jabiru Metals Ltd., 100%)	250 km north of Kalgoorlie, WA	420
Do.		McArthur River open pit mine [McArthur River Mining Pty Ltd. (Glencore plc, 100%)]	60 km southwest of Borroloola, NT	143
Do.		Mount Isa underground copper-lead-zinc-silver mine (also includes Enterprise, George Fisher, Hilton Mines, and Lady Loretta) (Glencore plc, 100%)	Mount Isa, QLD	175
Do.		Peak underground gold-zinc-lead-copper-silver underground mine (includes New Cobar, New Occidental, and Perseverance) (New Gold Inc., 100%)	8 km south of Cobar, NSW	8
Do.		Rosebery underground zinc-lead-silver-copper-gold mine [Minerals and Metals Group Australia Ltd. (China Minmetals Nonferrous Metals Co. Ltd., 100%)]	35 km north of Queenstown, TAS	100

See footnotes at end of table.

TABLE 2—Continued
 AUSTRALIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(Thousand metric tons unless otherwise specified)

Commodity	Facilities, major operating companies, and major equity owners	Location of main facilities ^{1, 2}	Annual capacity ³
Zinc:—Continued			
Smelter	Port Pirie smelter (Nyrstar NV, 100%)	5 km north of Queenstown, TAS	45
Do.	Hobart smelter (Nyrstar NV, 100%)	Hobart, TAS	320
Refinery	Sun Metals zinc refinery [Sun Metals Corp. Pty. Ltd. (Korea Zinc Co., 100%)]	Townsville, QLD	170

³Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

¹Abbreviations used for States and Territories in this table include the following: NSW—New South Wales; NT—Northern Territory; QLD—Queensland; SA—South Australia; TAS—Tasmania; VIC—Victoria; WA—Western Australia.

²Abbreviation(s) used for unit(s) of measure in this table include the following: km—kilometer.

³On care-and-maintenance status.

TABLE 3
AUSTRALIA: RESERVES OF MAJOR MINERAL COMMODITIES IN 2015

Commodity	Reserves ^{1,2}
Antimony, Sb content	thousand metric tons 139
Bauxite	million metric tons 6,195
Coal:	
Black coal, recoverable ³	billion metric tons 56
Brown coal, recoverable ⁴	do. 34
Cobalt, Co content	thousand metric tons 1,070
Copper, Cu content	million metric tons 88
Diamond	million carats 220
Gold, Au content	metric tons 9,080
Iron ore	billion metric tons 54
Lead, Pb content	million metric tons 35
Lithium, Li content	thousand metric tons 1,530
Magnesite (MgCO ₃ content)	million metric tons 318
Manganese ore	do. 227
Mineral sands:	
Ilmenite	do. 139
Rutile	do. 22
Zircon	do. 38
Molybdenum, Mo content	thousand metric tons 190
Nickel, Ni content	million metric tons 19
Niobium (columbium) and tantalum:	
Niobium (columbium), Nb content	thousand metric tons 205
Tantalum, Ta content	do. 67
Platinum-group metals (Ir, Os, Pd, Pt, Rh, Ru)	kilograms 3,500
Rare earths (rare-earth oxide plus Y ₂ O ₃)	thousand metric tons 3,190
Silver, Ag content	do. 85
Tin, Sn content	do. 413
Tungsten, W content	do. 392
Uranium, U content	do. 1,080
Vanadium, V content	do. 1,910
Zinc, Zn content	million metric tons 63
do. Ditto.	

¹Data are rounded to no more than three significant digits.

²Accessible Economic Demonstrated Resources (AEDR) as of December 2014, as reported by Geoscience Australia. AEDR refers to the portion of total economic demonstrated resources [which include Joint Ore Reserves Committee (JORC) reserves and measured and indicated resources] that is accessible for mining. It excludes resources that are inaccessible for mining because of environmental restrictions, government policies or military lands.

³Anthracite and bituminous coal.

⁴Lignite.