2016 Minerals Yearbook

CHILE

U.S. Department of the Interior
U.S. Geological Survey

December 2021

The Mineral Industry of Chile

By Yadira Soto-Viruet

Chile's position in the world's mineral economy was that of a leading supplier of many raw materials, especially metals associated with the mining of copper, and industrial minerals, such as lithium. In 2016, the country was estimated to be world's leading producer of mined copper (accounted for 28% of world production); iodine (65% of world production); lithium, (38% of world production); and rhenium (52% of world production). Chile was also estimated to be the world's second-ranked producer of boron (5%) and molybdenum (20%); the fourth-ranked producer of pumice and pumicite (5%); and the fifth-ranked producer of silver (6%). Chile's world rankings for mineral reserves were estimated as follows: first for copper, lithium, and rhenium; second for iodine; and fourth for boron and molybdenum (Brininstool, 2017; Crangle, 2017; 2018a, b; Jaskula, 2017, 2018; Polyak, 2017a, b; 2018a, b; Bennett, 2018; Flanagan, 2018; Schnebele, 2017, 2018).

The country's real gross domestic product (GDP) increased by 1.6% in 2016 compared with that of 2015. The mineral sector continued to be a significant economic activity in Chile, accounting for 8.1% of the total GDP. The copper industry accounted for 7.3% of the country's total GDP. The state-owned Corporación Nacional del Cobre de Chile (CODELCO) was the world's largest copper producer in terms of number of active projects or operations. CODELCO produced about 9% of the world's mined copper production and was the second-ranked molybdenum producer in the world. In 2016, the company accounted for about 30% of Chile's total copper production (Banco Central de Chile, 2017a, p. 8–9; Corporación Nacional del Cobre, 2017, p. 23–25; Servicio Nacional de Geología y Minería, 2017, p. 26, 45).

Chile is part of what has become to be known as South America's "Lithium Triangle," an area that hosts lithium-bearing salt flats along the borders of Argentina, Bolivia, and Chile. Historically, Chile's lithium production was recovered from two brine operations in the Salar de Atacama, located in the Andes Mountains. The two leading producers of lithium in the country were Albemarle Corp. of the United States and Sociedad Química y Minera de Chile S.A. (SQM). Chile and Argentina were the principal sources of lithium carbonate and lithium hydroxide imported by the United States. In 2016, Chile's lithium carbonate and lithium hydroxide production increased by about 40% each compared with that of 2015; all production was exported. Exports of lithium carbonate increased in value by 90% in 2016 compared with that of 2015 and accounted for about 40% of the country's total industrial mineral exports. The increases in lithium production and exports were owing to rapidly increasing demand for lithium carbonate and hydroxide, which were used mainly to produce cathodes for rechargeable batteries. Batteries were the leading application for lithium, especially for electric vehicle batteries (tables 1, 2; Comisión Chilena del Cobre, 2017, p. 26; Servicio Nacional de Geología y Minería, 2017, p. 86–87; Sociedad Química y Minera de Chile S.A., 2017, p. 22; Jaskula, 2018).

Chile is the only member of the Organisation of Economic Cooperation and Development (OECD) in South America. The country is the fifth-ranked consumer of fossil fuels on the continent and was heavily dependent on coal, crude petroleum, natural gas, and refined petroleum products imports to meet domestic demand. Crude petroleum and natural gas were produced exclusively from the Magallanes y de la Antartica Chilena Region. As of 2016, the country held about 150 million barrels (Mbbl) of crude petroleum reserves and about 98 billion cubic meters of natural gas reserves. In 2016, coal, crude petroleum, and natural gas accounted for 5% of Chile's total imports and for 87% of the country's total mineral product imports. The country's crude petroleum imports were mainly from Argentina, Brazil, Colombia, Ecuador, and Peru; however, the United States was Chile's leading source of refined petroleum products (U.S. Department of Energy, 2016; Banco Central de Chile, 2017c, p. 58; Servicio Nacional de Geología y Minería, 2017, p. 114–115; U.S. Central Intelligence Agency, 2018).

Minerals in the National Economy

In 2016, the value of Chile's mineral sector decreased by 2.9%, which was mainly attributed to a decrease of 2.7% in the value of copper production. The decrease in copper production was owing to lower copper prices on the international market, lower ore grades, unfavorable weather conditions, and scheduled maintenance downtime at some mining operations. Chile's employment in the mining and quarrying sector decreased to 218,160 workers in 2016 from 238,454 workers in 2015 (Banco Central de Chile, 2017a, p. 11, 38, 40; Corporación Nacional del Cobre, 2017, p. 5, 11; Servicio Nacional de Geología y Minería, 2017, p. 150).

Chile was one of Latin America's key destination countries for foreign direct investment (FDI) from the world, accounting for 7% of total FDI inflows in Latin America and the Caribbean. FDI inflows decreased for the second consecutive year, however, by 40.3% to $12.2 billion, which represented the lowest level of FDI inflows in 10 years. The decrease was attributed to a decrease in intercompany lending. The mineral sector continued to attract foreign capital, mainly as a result of the increasing demand for lithium batteries in the electronic vehicles industry. The mineral sector was the leading recipient of FDI in Chile, accounting for 52% of total FDI in 2016 (Economic Commission for Latin America and the Caribbean, 2017, p. 33, 35, 60; Ernst & Young, Chile, 2017, p. 17).

Government Policies and Programs

Regulations governing Chile's mineral industry are contained in Decree with Force of Law (DFL) No. 302. The Ministerio de Minería [Ministry of Mining] exercises control of the mineral industry through state-owned companies and regulatory agencies, including the Comisión Chilena del Cobre (COCHILCO), CODELCO, Empresa Nacional de Minería (ENAMI), and Empresa Nacional del Petróleo (ENAP). The legal framework for mining in Chile is based on the country's Organic Constitutional Law on Mining Concessions [law No. 18.097 of 1982] and the Chilean Mining Code [law No. 18.248 of 1983]. COCHILCO was created in 1976 by law No. 1.349. COCHILCO advises the Government on matters concerning the production of copper, copper byproducts, and other metals, and on industrial minerals mining. CODELCO was involved in industrial, mining, and trade activities. Decree Law 1350 (1976) created CODELCO, which began managing all the large-scale mines nationalized in 1971. CODELCO reports to the Government through the Ministry of Mining (Corporación Nacional del Cobre, 2017, p. 26; Comisión Chilena del Cobre, 2018a, b; Ministerio de Mineria, 2019).

ENAMI, which was the national mining corporation, was founded in 1960 to promote medium- and small-size private-sector mining in Chile. It does so by providing incentives aimed at correcting market failures, and by supplying technical, financial, metallurgical production, and trading services to help the companies be competitive. ENAP's main line of business is the exploration, production, refining, and marketing of hydrocarbons and their byproducts. It was created by Organic Law No. 9618 of June 19, 1950. It operates as a commercial company, under a public law juridical regime and is autonomously managed. ENAP participates in the exploration and production of hydrocarbons through its subsidiary Enap Sipetrol S.A. and in the refining, transportation, storage, and marketing of petroleum-based products through Enap Refinerías S.A. (Empresa Nacional de Mineria, 2017; Empresa Nacional del Petróleo, 2018; Ministerio de Mineria, 2019).

The main environmental law in Chile, law No. 19.300, was enacted on March 9, 1994, and was amended on December 7, 2002, by Decreto Supremo 95, which requires environmental impact studies for any new investment projects that involve either exploration for or extraction of the country's natural resources (including minerals). In July 2011, the Chilean Congress approved law No. 20.551 to regulate the closure and environmental remediation of mine sites and mining facilities. The law entered into force on November 11, 2012. On June 18, 2012, the Chilean Congress approved law No. 20.600, which established new environmental courts to arbitrate in cases of environmental violations (Biblioteca del Congreso Nacional de Chile, 2019a).

In 2015, Chile enacted law No. 20.848, which repealed the 1974 foreign investment statute, known as Decree Law 600 (DL 600). Law No. 20.848, which became official in January 1, 2016, established a new legal framework for FDI in the country and created the Foreign Investment Promotion Agency, also known as InvestChile. InvestChile is the legal successor and continuer of the former Foreign Investment Committee, and the agency responsible for promoting and attracting all types of FDI into the country. Under the new law, the President of Chile established a strategy for the development and promotion of FDI and creates a Committee of Ministers for the Development and Promotion of Foreign Investment (Committee of Ministers), whose purpose is to advise the President. The Committee of Ministers is to be chaired by the Minister of Economy, Development and Tourism and will include the Minister of Finance and all other Ministers whom the President appoints. All foreign investment contracts signed between the Government and foreign investors under the Decree Law 600 before January 1, 2016, are to remain in force, along with the rights and obligations envisaged in the contracts and are to be administrated by InvestChile (U.S. Department of State, 2016; InvestChile, 2017, p. 1; 2018; Biblioteca del Congreso Nacional de Chile, 2019b).

Production

In 2016, Chile's copper sulfate production increased by 20% to 11,410 metric tons (t) from 9,496 t in 2015. Increases in the output of industrial minerals were led by marble (83%); peat (57%); lithium hydroxide (43%); lithium carbonate (40%); guano (phosphate rock) (35%); ground calcium carbonate, limestone, potassium chloride, and unspecified silica (11% each); and travertine (10%). Production of zeolites was reported as 386 t in 2016 compared with 0 t in 2015. Among the mineral fuels and related materials, production of natural gas increased by 13% to about 1.2 billion cubic meters from 1.0 billion cubic meters. Data on mineral production are in table 1.

Lead production decreased by 63% to 1,110 t in 2016 from 2,979 t in 2015, and zinc production, by 11% to 42,870 t from 48,071 t. Decreases in output of industrial minerals were led by apatite (gross weight and estimated P_2O_5 content, by 76% each), bauxitic clay (34%), lithium chloride (14%), iodine (13%), and bentonite (10%). Among the mineral fuels, production of other petroleum refinery products decreased by 26% to 4.7 Mbbl from 6.4 Mbbl; production of liquefied petroleum gas, by 21% to 2.4 Mbbl from 3.1 Mbbl; production of bituminous coal, by 20% to 2.5 million metric tons (Mt) in 2016 from 3.2 Mt in 2015; and production of crude petroleum (including condensate), by 16% to 1.5 Mbbl from 1.8 Mbbl (revised).

Structure of the Mineral Industry

The leading Chilean-owned companies in the mineral industry were state-owned CODELCO, and privately owned Compañía Minera del Pacífico S.A. (CAP Minería, Molibdenos y Metales S.A. (Molymet), and SQM. CAP Minería was the principal producer and exporter of iron ore and pellets in Chile; SQM was among the world's leading producers of iodine, lithium carbonate, and natural potassium nitrate; and MOLYMET was the world's leading producer of rhenium (table 2; Compañía Minera del Pacífico S.A., 2017, p. 27, 30–31; Corporación Nacional del Cobre, 2017, p. 23; Molibdenos y Metales S.A., 2017, p. 10, 36; Sociedad Química y Minera de Chile S.A., 2017, p. 17).

CODELCO had seven operating mining divisions (Andina, Chuquicamata, El Teniente, Gabriela Mistral, Ministro Hales, Radomiro Tomic, and Salvador), all of which were located in northern and central Chile. The Escondida Mine of Minera Escondida Ltda.—a joint venture among BHP Billiton Ltd. of Australia (57.5%), Rio Tinto plc, a British-Australian multinational company (30%), Mitsubishi Corp. of Japan (10%), and the International Finance Corp. of the United States (2.5%)—continued to be the country's leading mine, accounting for about 18% of Chile's total mined copper production in 2016. Escondida is a porphyry copper deposit located in the Antofagasta Region in northern Chile. Escondida comprised two open pits that fed two concentrator plants as well as two leaching operations (oxide and sulfide) (table 2; BHP Billiton Ltd., 2017, p. 56; Comisión Chilena del Cobre, 2017, p. 17; Corporación Nacional del Cobre, 2017, p. 23).

In 2016, CAP Minería held 1,650 active mining concessions that covered 323,858 hectares (ha) and 241 active exploration licenses that covered 176,600 ha. CAP Minería was the sole supplier of iron ore and pellets to the integrated Chilean steelmaker Compañía Siderúrgica Huachipato S.A. (Albemarle Corp., 2017b, p. 4; Compañía Minera del Pacífico S.A., 2017, p. 27, 30–31; Sociedad Química y Minera de Chile S.A., 2017, p. 10, 17).

Mineral Trade

In 2016, the total value of Chile's exports amounted to $60.6 billion compared with $62.2 billion in 2015. Chile's leading export partners were, in order of value, China (which received 29% of the country's exports), the United States (14%), and the European Union (13%). The total value of Chile's imports in 2016 was $58.8 billion compared with $62.5 billion in 2015. Its major import partners were, in order of value, China (which supplied 24% of the country's imports), the European Union and the United States (17% each), and the Mercado Comun del Sur (Mercosur; 13%). In 2016, the country's mining sector accounted for 52% of total exports and 6% of total imports, in terms of value (Banco Central de Chile, 2017b, p. 6; 2017c, p. 6–7, 30, 58).

According to COCHILCO, the value of the country's mineral exports decreased to $31.1 billion in 2016 from $34.4 billion in 2015. In 2016, metals accounted for 95% of total mineral exports; however, the value of metal exports decreased by 10% ($29.6 billion) compared with that of 2015. Copper valued at $26.8 billion continued to be the leading mineral product export, accounting for 91% of the country's total metal exports and 86% of its total mineral exports. The total value of the country's copper exports decreased by 12% in 2016, whereas that of iron, gold, and zinc increased by 15%, 5%, and 3%, respectively. In 2016, the value of molybdenum exports increased by 2% (to $921 million from $906 million in 2015); this was the first increase in molybdenum exports since 2007, when the value was about $4.0 billion. The increase in the value of molybdenum exports was attributed to a 42% increase in the value of molybdenum trioxide exports (Comisión Chilena del Cobre, 2017, p. 26, 28–29).

The value of Chile's industrial mineral exports increased by 6% to $1.1 billion in 2016. During the year, the leading industrial mineral product export, by value, was lithium carbonate (valued at $465 million), which accounted for 42% of total industrial mineral exports, followed by iodine (37%); rock salt (12%); and nitrate (9%). The value of lithium carbonate exports increased by 89% in 2016 compared with that of 2015 and 103% compared with that of 2014. In 2016, about 70% ($21.8 billion worth) of Chile's mineral exports were shipped to Asia (Comisión Chilena del Cobre, 2017, p. 26, 28–29).

Commodity Review

Metals

Copper.—The Antofagasta Region was ranked first among the country's copper-producing regions in 2016, accounting for about 52% of copper production, followed by the Tarapaca Region (11%). In 2016, total copper production (including concentrates and cathodes) was 5.6 Mt; of which 95% was by large-scale mining companies; 4%, by medium-scale companies; and 1%, by small-scale producers. The Servicio Nacional de Geología y Minería reported that about 2,000 t of copper produced in 2016 was a byproduct of gold mining; of the byproduct copper produced, small-scale operations accounted for 34% and large- and medium-scale operations accounted for 33% each (Servicio Nacional de Geología y Minería, 2017, p. 45–47).

In 2016, CODELCO's leading producing mines were the Chuquicamata and the Radomiro Tomic Mines (located in the Antofagasta Region) and El Teniente Mine (located in the Libertador General Bernardo O'Higgins Region). Production from these three mines accounted for about 60% of CODELCO's total copper production. CODELCO reported total proven and probable mineral reserves from Andina, Chuquicamata, El Teniente, Gabriela Mistral, Ministro Hales, Radomiro Tomic, and Salvador to be 6.7 Mt at an average grade of 0.68% copper. CODELCO continued with its plans to convert the Chuquicamata open pit mine into an underground operation to extend the life of the mine by an additional 40 years. In 2016, the company began the development of the project and, by yearend, had developed more than 59 of the 181 kilometers (km) required to complete the conversion, including chimneys, tunnels, and shafts. CODELCO expected to begin underground operations in 2019. The company also continued with its plans to deepen the mining of the El Teniente deposit; adding reserves that would increase the El Teniente's mine life by an additional 50 years. The project, called El Teniente New Mine Level, was expected to be completed by 2023 (Corporación Nacional del Cobre, 2017, p. 43, 52, 57; 2019).

Antofagasta plc of the United Kingdom, through its subsidiary Antofagasta Minerals S.A. (AMSA), operated four copper mines, two of which produced significant byproducts. The company held a 70% interest in the Antucoya Mine, which produced copper cathodes; a 70% interest in the Centinela Mine, which produced copper concentrates (containing gold and silver) and copper cathodes; a 60% interest in Los Pelambres Mine, which produced copper concentrates containing gold, silver, and molybdenum; and a 50% interest in the Zaldivar Mine, which produced copper cathodes. In 2016, Los Pelambres Mine, which is located in the Coquimbo Region, accounted for 7% of the total mined copper production in the country. An expansion project for Los Pelambres was underway during the year. The project was expected to have two phases. After phase 1 is completed, Antofagasta estimated that copper production would increase to an average of 55,000 metric tons per year (t/yr) during a period of 15 years. For phase 2, the company estimated that throughput would increase to 205,000 metric tons per day (t/d) and that the mine's life would be extended past the currently approved 21 years. A feasibility study for Los Pelambres was expected to be completed by 2017. In 2016, Centinela's concentrator plant reached a design capacity of 105,000 t/d. A feasibility study for the construction of a second concentrator at Centinela was expected in 2017; this concentrator would produce about 140,000 t/yr of copper, 4,300 kilograms per year (kg/yr) of gold, and 2,800 t/yr of molybdenum (table 2; Antofagasta plc, 2017, p. 3, 17, 42; Comisión Chilena del Cobre, 2017, p. 17).

In 2015, the Sociedad Contractual Minera El Abra, which was a joint venture between Freeport-McMoRan Inc. of the United States (51%) and CODELCO (49%), reported that it would decrease its mining output at the mine by approximately 50% to achieve lower operating and labor costs, defer capital expenditures, and extend the life of existing operations. El Abra Mine, which is located in the Antofagasta Region, had a capacity of about 120,000 t/yr of copper. As of December 31, total recoverable proven and probable reserves were reported as 431 Mt at an average grade of 0.45% copper. During the year, the company continued evaluating a potential large-scale milling operation at El Abra to process additional sulfide material and to achieve higher recoveries; however, future investments would depend on economic factors, the results of technical studies, and market conditions. In 2016, El Abra accounted for nearly 2% of the country's total mined copper production (Comisión Chilena del Cobre, 2017, p. 17; Freeport-McMoRan Inc., 2017, p. 11, 36, 130).

Gold and Silver.—In 2016, the country's gold production increased by about 9% to 46,333 kilograms (kg) from 42,501 kg in 2015. During the year, about 23,649 kg, or 51.0%, of the gold production in Chile was produced by gold mines, about 48.6% was produced as a byproduct of copper mining, and the rest was produced as a byproduct of lead and zinc mining. Of the 23,649 kg produced from gold mines, large-scale gold mining operations accounted for 79% and the remainder was from medium- and small-scale operations. The Antofagasta Region was ranked first among the country's leading gold-producing regions, accounting for 48% of total gold production, followed by the Atacama (24%), the Coquimbo (14%), and the Region Metropolitana (Santiago) (7%) Regions. Other gold-producing regions included Aysen, Maule, Libertador General Bernardo O'Higgins, and Valparaiso. Production of silver was 1,500 t, which was about the same amount produced in 2015. The Antofagasta Region also ranked first among Chile's silver-producing regions, accounting for about 61% of production, followed by the Atacama (9%) and the Coquimbo (8%) Regions. Of the 1,500 t of silver output, about 82% was produced from copper-mining operations and the remainder was produced from gold, lead, and zinc operations (table 1; Servicio Nacional de Geología y Minería, 2017, p. 51, 53, 57–58).

Lead and Zinc.—Chile's lead production comes exclusively from the Aysen Region. In 2016, about 53% of the lead produced in the country was obtained as a byproduct of zinc mining. Zinc production comes from the Aysen and the Region Metropolitana (Santiago) Regions. The Region Metropolitana (Santiago) produced about 77% of the country's total zinc production. In June, Laguna Gold of Australia acquired 100% interest in El Toqui underground mine, which is the only large-scale mining operation for lead and zinc in the country. Total probable and proven reserves at El Toqui were reported as 1.51 Mt at average grades of 5.77% zinc, 0.20% lead, 15.88 grams per metric ton (g/t) silver, and 0.58 g/t gold (table 2; Servicio Nacional de Geología y Minería, 2017, p. 61–62; Laguna Gold, 2018).

Molybdenum and Rhenium.—Molybdenum was produced as a byproduct of copper production. In 2016, molybdenum production increased by 6% to 55,834 t. The leading producing regions were Antofagasta and Coquimbo, which accounted for 53% and 13%, respectively, of the total molybdenum production in the country. CODELCO continued to be the leading producer of molybdenum in the country; its leading producing mines were the Chuquicamata and the Radomiro Tomic Mines, which together accounted for about 60% of CODELCO's molybdenum production. In 2016, production from CODELCO increased by 11% to 30,640 t from 27,683 in 2015. During the year, production from Los Pelambres, which was the leading producing mine that was privately owned, decreased by about 30% to 7,164 t in 2016 from 10,150 t in 2015. The decrease in production was attributed to lower grades and recoveries at the mine. Los Pelambres, which had the capacity to produce about 12,500 t/yr of molybdenum, was expected to produce between 8,500 and 9,500 t in 2017 (table 2; Antofagasta plc, 2017, p. 44; Comisión Chilena del Cobre, 2017, p. 19; Servicio Nacional de Geología y Minería, 2017, p. 50).

In 2016, CODELCO, through its subsidiary Molyb Ltda., began operations at its molybdenum concentrate treatment plant located in Mejillones, Antofagasta Region. The plant, which was completed at a total investment cost of $555 million, would produce 16,500 t/yr of molybdenum and 8,000 kg/yr of rhenium as a byproduct. Molyb completed its first shipment of molybdenum from the plant in September. Molymet processed molybdenum concentrates mainly through multiyear contracts with national and foreign copper companies. Since 2010, the company had maintained a long-term supply contract with CODELCO. CODELCO supplied molybdenum concentrates to Molymet from its Andina, Chuquicamata, El Teniente, and Salvador Divisions. Molymet produced rhenium at its Nos plant, which was located in San Bernardo, Region Metropolitana (Santiago), and had the capacity to produce about 30,000 t/yr of rhenium (table 2; Corporación Nacional del Cobre, 2016; 2017, p. 103; Molibdenos y Metales S.A., 2017, p. 36, 40).

Industrial Minerals

Boron.—Boron (ulexite) production in Chile increased by about 8% in 2016 to 558,854 t from 517,584 t in 2015. Borates are defined as esters or salts of boric acid, which are compounds containing boric oxide. Many minerals contain boric oxide, but those that are the most commercially important are borax, ulexite, and colemanite. Sources of borates in Chile were primarily ulexite associated with Andean salars in the northern part of the country in the Antofagasta and the Arica y Parinacota Regions. In 2016, about 94% of the ulexite output was produced in Arica and Parinacota. Borate deposits in Chile included the Salar Aguas Calientes Norte, Salar Aguas Calientes Sur, Salar de Ascotan, Salar de Atacama, Salar Colpitas, Salar Maricunga, Salar Perdanales, Salar Punta Negra, Salar Quisquiro, and Salar de Surire. Química Industrial del Bórax Ltda., which was located in Arica y Parinacota Region, and SQM, which was located in the Antofagasta Region, produced boron compounds (table 1; Kistler and Helvaci, 2006, p. 171, 178–180; Servicio Nacional de Geología y Minería, 2017, p. 84).

Iodine.—SQM, through its wholly owned subsidiary SQM Salar S.A., continued to be the country's leading producer of iodine with a production capacity of 10,000 t/yr. The company produced iodine, potassium nitrate, sodium nitrate, and sodium potassium nitrate from the caliche ore deposits in northern Chile. Production of iodine decreased to 18,444 t in 2016 from 21,179 t in 2015. In 2016, the Tarapaca Region accounted for about 73% of total production; the Antofagasta Region produced the remaining 27%. In 2016, SQM produced 8,542 t of iodine; of which 90% was produced at the Nueva Victoria and the Iris plants Other iodine-producing companies included Atacama Chemical S.A. (controlled by the Chilean holding company Inverraz S.A.), ACF Minera S.A.; Algorta Norte S.A. (a joint venture between ACF Minera S.A. and Toyota Tsusho Corp. of Japan), SCM Bullmine, and RB Energy (a Canadian company previously known as Sirocco Mining Inc. or as Atacama Minerals) (table 2; Servicio Nacional de Geología y Minería, 2017, p. 109; Sociedad Química y Minera de Chile S.A., 2017, p. 31).

Lithium.—The source of Chile's globally significant lithium reserves are the brine deposits in the Salar de Atacama, which is located about 250 km from Antofagasta. The brine deposits of the Salar de Atacama, which is a salt-encrusted depression in the Atacama Desert, contain high concentrations of lithium and potassium as well as significant concentrations of sulfate and boron. Chile's lithium continued to be recovered from two brine operations, which were owned by Albemarle through its subsidiary Rockwood Lithio Ltda., and SQM. Concentrated brines were transported and processed at Albemarle's lithium carbonate and lithium chloride plants located in La Negra and SQM's lithium carbonate and lithium hydroxide plants located near the city of Antofagasta. The region of Antofagasta has been producing lithium carbonate uninterruptedly since 1984; lithium chloride, since 1999; and lithium hydroxide, since 2005. In 2016, SQM's lithium carbonate production capacity was 48,000 t/yr and its lithium hydroxide production capacity was 6,000 t/yr. Owing to the increasing demand for lithium carbonate and lithium hydroxide, SQM reported that it would increase its lithium hydroxide capacity to 13,500 t/yr during 2017. In February, Albemarle announced that the company had entered into a memorandum of understanding (MOU) with the Government to increase the company's lithium brine removal rates at the Salar de Atacama. The MOU provided enough lithium to support the production of 70,000 t/yr of technical and battery grade lithium salts and 6,000 t/yr of lithium chloride over the next 27 years at the company's facilities in La Negra. In December, however, the company amended its agreement with the Government to increase its authorized lithium quota in the Salar de Atacama, which would then support the production of more than 80,000 t/yr of technical- and battery-grade lithium salts during the same period (Albemarle Corp., 2016; 2017a; 2017b, p. 4, 29; Servicio Nacional de Geología y Minería, 2017, p. 86; Sociedad Química y Minera de Chile S.A., 2017, p. 10, 22–23).

Pumice.—Production of pumice increased by 5% to 840,976 t in 2016 from 804,121 t in 2015. The Region Metropolitana (Santiago) and the Libertador General Bernardo O'Higgins Region were the leading producing regions, accounting for 68% and 23% of the total pumice production in 2016, followed by the Antofagasta Region (5%) and the Maule Region (4%). Pumice-producing companies included Compañía Minera Polpaico Ltda., Imerys Minerales Santiago Ltda., Minera El Way S.A., Minera Melon S.A., and Minera Rio Teno S.A. (Servicio Nacional de Geología y Minería, 2017, p. 95).

Mineral Fuels

Coal, Natural Gas, and Petroleum.—Coal was produced mainly in the Magallanes y de la Antartica Chilena Region. Mina Invierno S.A., which was jointly owned by Empresas Copec S.A. and Ultramar Shipping Co., was the leading producer of coal in the country. Mina Invierno mined coal at Isla Riesco in the Magallanes y de la Antartica Chilena Region. Mina Invierno's mining concessions included the Adela, the Elena, the Invierno, and the Río Eduardo deposits, which had total reserves of 389 Mt. In 2016, coal production at Mina Invierno decreased by 22% to 2.4 Mt of coal. About 74% of Empresas Copec's coal sales were domestic, and the remainder was being sold in Asia, mainly to India. Empresas Copec reported that shipments to Spain were expected to begin in early 2017. In 2016, the country's crude petroleum and natural gas production was exclusively from the Magallanes y de la Antartica Chilena Region (table 2; Empresas Copec, 2017, p., 90; Servicio Nacional de Geología y Minería, 2017, p. 113–115).

Reserves and Resources

Table 3 lists Chile's reserves of major mineral commodities.

Outlook

According to the Banco Central de Chile, the country's GDP is forecasted to increase by 1.5% in 2017. The mineral sector GDP is expected to decrease by about 2% owing to the decrease in the value of copper by about 2%, which is likely to continue to be affected mainly by lower ore grades. Mining companies in Chile are likely to depend on demand from China, India, and other emerging economies to maintain the country's current copper production rates. The value of copper exports is expected to increase by about 20% owing to an expected increase in copper prices in 2017; however, the quantity of copper exports is expected to decrease by nearly 3%. Escondida is expected to remain the world's top copper-producing mine. Several copper projects are under construction or at the feasibility stage, which will likely maintain Chile as a world leading producer of copper—these included Antofagasta Mineral's Centinela and Los Pelambres projects and CODELCO's Chuquicamata and El Teniente projects. The mineral sector is likely to continue to be one of the principal sectors receiving FDI in the country owing mainly to the growing interest in the country's lithium resources (Banco Central de Chile, 2018a, p. 6, 11; 2018b, p. 4, 5–6).

References Cited

Albemarle Corp., 2016, Albemarle granted permit to increase lithium brine extraction rates in Chile and enters into MOU with Chilean Government for 27-year lithium quota: Baton Rouge, Louisiana, Albemarle Corp., February 1. (Accessed May 3, 2019, at https://www.albemarle.com/news/albemarle-granted-permit-to-increase-lithium-brine-extraction-rates-in-chile-and-enters-into-mou-with-chilean-government-for-27-year-lithium-quota.)

Albemarle Corp., 2017a, Albemarle receives final approval to expand lithium operations in Chile: Charlotte, North Carolina, Albemarle Corp., January 4. (Accessed October 3, 2019, at https://www.albemarle.com/news/albemarle-receives-final-approval-to-expand-lithium-operations-in-chile.)

Albemarle Corp., 2017b, Annual report 2016: Charlotte, North Carolina, Albemarle Corp., 122 p. (Accessed March 28, 2018, at https://investors.albemarle.com/static-files/73b69509-66f8-4dcf-a2aa-409df42c6301.)

Antofagasta plc, 2017, Annual report and financial statements 2016: London, United Kingdom, Antofagasta plc., 206 p. (Accessed March 30, 2018, at http://www.antofagasta.co.uk/media/3245/ant001_2016-annual-report_bookmarked.pdf.)

Banco Central de Chile, 2017a, Cuentas nacionales de Chile 2013–2016 [National accounts of Chile 2013–2016]: Santiago, Chile, Banco Central de Chile, 182 p. (Accessed March 27, 2018, at https://si3.bcentral.cl/estadisticas/Principal1/Informes/anuarioCCNN/pdf/CCNN2016_CR2013.pdf.)

Banco Central de Chile, 2017b, Indicadores de comercio exterior—Cuarto trimestre de 2016 [Foreign trade indicators—Fourth quarter of 2016]: Santiago, Chile, Banco Central de Chile, February, 263 p. (Accessed March 16, 2018, at https://si3.bcentral.cl/estadisticas/Principal1/Informes/SE/COMEX/ice2016T4.pdf.)

Banco Central de Chile, 2017c, Indicadores de comercio exterior—Primer trimestre 2017 [Foreign trade indicators—First quarter of 2017]: Santiago, Chile, Banco Central de Chile, May, 259 p. (Accessed March 16, 2018, at https://si3.bcentral.cl/estadisticas/Principal1/Informes/SE/COMEX/ice2017T1.pdf.)

Banco Central de Chile, 2018a, Balanza de pagos de Chile, posicion de inversion internacional y deuda externa 2017 [Balance of payment and international investment position and external debt 2017]: Santiago, Chile, Banco Central de Chile, 40 p. (Accessed March 27, 2018, at https://si3.bcentral.cl/estadisticas/Principal1/Informes/AnuarioBDP/pdf/Anuario_BP_2017.pdf.)

Banco Central de Chile, 2018b, Cuentas nacionales de Chile 2013–2017 [National accounts of Chile 2013–2017]: Santiago, Chile, Banco Central de Chile, 41 p. (Accessed March 27, 2018, at https://si3.bcentral.cl/estadisticas/Principal1/Informes/anuarioCCNN/pdf/ANUARIO_CCNN_2017.pdf)

Bennett, S.M., 2018, Silver: U.S. Geological Survey Mineral Commodity Summaries 2018, p. 150–151.

BHP Billiton Ltd., 2017, Annual report 2016: Melbourne, Victoria, Australia, BHP Billiton Ltd., 292 p. (Accessed March 28, 2018, at https://www.bhp.com/-/media/bhp/documents/investors/annual-reports/2016/bhpbillitonannualreport2016.pdf?la=en.)

Biblioteca del Congreso Nacional de Chile, 2019a, Decreto 95—Modifica reglamento del sistema de evaluación de impacto ambiental [Modifies regulation of the environmental impact assessment system]: Biblioteca del Congreso Nacional de Chile. (Accessed May 3, 2019, at https://www.leychile.cl/Navegar?idNorma=30667.)

Biblioteca del Congreso Nacional de Chile, 2019b, Historia de la Ley Nº 20.848 [History of law No. 20.848]: Biblioteca del Congreso Nacional de Chile, June 25. (Accessed May 3, 2019, at https://www.bcn.cl/historiadelaley/nc/historia-de-la-ley/4027/.)

Brininstool, Mark, 2017, Copper: U.S. Geological Survey Mineral Commodity Summaries 2017, p. 54–55.

Comisión Chilena del Cobre, 2017, Anuario de estadísticas del cobre y otros minerals 1995–2016 [Statistical yearbook on copper and other minerals 1995–2016]: Santiago, Chile, Comisión Chilena del Cobre, 166 p. (Accessed March 19, 2018, at https://www.cochilco.cl/Lists/Anuario/Attachments/17/Anuario-%20avance7-10-7-17.pdf.)

Comisión Chilena del Cobre, 2018a, Featured laws: Santiago, Chile, Comisión Chilena del Cobre. (Accessed March 28, 2018, at https://www.cochilco.cl/Paginas/English/Legislation/Featured-Laws.aspx.)

Comisión Chilena del Cobre, 2018b, Mision [Mission]: Santiago, Chile, Comisión Chilena del Cobre. (Accessed March 23, 2018, at https://www.cochilco.cl/Paginas/Quienes-Somos/Misi%C3%B3n.aspx.)

Compañia Minera del Pacifico S.A., 2017, Memoria anual 2016 [Annual report 2016]: La Serena, Chile, Compañia Minera del Pacifico S.A., 149 p. (Accessed March 28, 2018, at http://www.capmineria.cl/wp-content/uploads/2017/03/cap_mineria_memoria_2016.pdf.)

Corporación Nacional del Cobre, 2016, Molyb concreto su primer embarque de molibdeno [Molyb completed its first shipment of molybdenum]: Mejillones, Chile, Corporación Nacional del Cobre, September 20. (Accessed September 6, 2018, at https://www.codelco.com/molyb-concreto-su-primer-embarque-de-molibdeno/prontus_codelco/2016-09-20/183616.html.)

Corporación Nacional del Cobre, 2017, Annual report 2016: Santiago, Chile, Corporación Nacional del Cobre, 116 p. (Accessed March 28, 2018, at https://www.codelco.com/memoria2016/en/pdf/annual-report/annual-report-2016.pdf.)

Corporación Nacional del Cobre, 2019, Nuevo nivel mina El Teniente [New level at El Teniente Mine]: Santiago, Chile, Corporación Nacional del Cobre. (Accessed April 30, 2019, at https://www.codelco.com/nuevo-nivel-mina-el-teniente/prontus_codelco/2016-04-05/201244.html.)

Crangle, R.D., Jr., 2017, Boron: U.S. Geological Survey Mineral Commodity Summaries 2017, p. 38–39.

Crangle, R.D., Jr., 2018a, Boron: U.S. Geological Survey Mineral Commodity Summaries 2018, p. 36–37.

Crangle, R.D., Jr., 2018b, Pumice and pumicite: U.S. Geological Survey Mineral Commodity Summaries 2018, p. 128–129.

Economic Commission for Latin America and the Caribbean, 2017, Foreign direct investment in Latin America and the Caribbean:Santiago, Chile Economic Commission for Latin America and the Caribbean, 189 p. (Accessed March 27, 2018, at https://repositorio.cepal.org/bitstream/handle/11362/42024/4/S1700815_en.pdf.)

Empresa Nacional del Petróleo, 2018, Description: Santiago, Chile, Empresa Nacional del Petróleo. (Accessed July 26, 2018, at http://www.enap.cl/pag/510/1573/description/.)

Empresa Nacional de Mineria (ENAMI), 2017, Quiénes somos [About us]: Santiago, Chile, Empresa Nacional de Mineria (ENAMI). (Accessed March 23, 2018, at http://www.enami.cl/QuienesSomos.)

Empresas Copec, 2017, Annual report 2016: Las Condes, Chile, Empresas Copec, 146 p. (Accessed March 22, 2018, at http://investor.empresascopec.cl/wp-content/uploads/Annual-Report-2016.pdf.)

Ernst & Young, Chile, 2017, Chile's mining and metals investment guide 2016-2017: Santiago, Chile, Ernst & Young, Chile, 78 p. (Accessed July 25, 2018, at https://www.eychile.cl/Content/pdf/Estudios/12052017154045_pdf_Gu%C3%ADa%20para%20la%20inversi%C3%B3n%20minera%20en%20Chile.pdf.)

Flanagan, D.M., 2018, Copper: U.S. Geological Survey Mineral Commodity Summaries 2018, p. 52–53.

Freeport-McMoRan Inc., 2017, Annual report 2016: Phoenix, Arizona, Freeport-McMoRan Inc., 136 p. (Accessed March 30, 2018, at https://s22.q4cdn.com/529358580/files/doc_financials/annual/FCX_AR_2016.pdf.)

InvestChile, 2017, New foreign investment regime, Law 20.848: Santiago, Chile, InvestChile, 6 p. (Accessed May 3, 2019, at https://investchile.gob.cl/wp-content/uploads/2017/03/NEW-FOREIGN-INVESTMENT-REGIME.pdf.)

InvestChile, 2018, About us: Santiago, Chile, InvestChile. (Accessed July 3, 2018, at https://investchile.gob.cl/aboutus/.)

Jaskula, B.W., 2017, Lithium: U.S. Geological Survey Mineral Commodity Summaries 2017, p. 100–101.

Jaskula, B.W., 2018, Lithium: U.S. Geological Survey Mineral Commodity Summaries 2018, p. 98–99.

Kistler, R.B., and Helvaci, Cahit, 2006, Boron and borates, *in* Kogel, J.E., Trivedi, N.C., Barker, J.M., and Krukowski, S.T., eds., Industrial minerals and rocks (7th ed.): Littleton, Colorado, Society for Mining, Metallurgy, and Exploration, p. 171–186.

Laguna Gold, 2018, Mining: Melbourne, Victoria, Australia, Laguna Gold. (Accessed March 28, 2018, at http://lagunagold.com/index.html.)

Ministerio de Mineria, 2019, Historia [History]: Santiago, Chile, Ministerio de Mineria. (Accessed May 23, 2019, at http://www.minmineria.gob.cl/ministerio/historia/.)

Molibdenos y Metales S.A., 2017, 2016—Memoria anual [2016—Annual report]: San Bernardo, Chile, Molibdenos y Metales S.A., 264 p. (Accessed May 23, 2019, at http://www.molymet.cl/en/Inversionistas/Memorias/Memoria%20Anual%20Molymet%202016.pdf.)

Polyak, D.E., 2017a, Molybdenum: U.S. Geological Survey Mineral Commodity Summaries 2017, p. 112–113.

Polyak, D.E., 2017b, Rhenium: U.S. Geological Survey Mineral Commodity Summaries 2017, p. 136–137.

Polyak, D.E., 2018a, Molybdenum: U.S. Geological Survey Mineral Commodity Summaries 2018, p. 110–111.

Polyak, D.E., 2018b, Rhenium: U.S. Geological Survey Mineral Commodity Summaries 2018, p. 134–135.

Schnebele, E.K., 2017, Iodine: U.S. Geological Survey Mineral Commodity Summaries 2017, p. 82–83.

Schnebele, E.K., 2018, Iodine: U.S. Geological Survey Mineral Commodity Summaries 2018, p. 80–81.
Servicio Nacional de Geología y Minería, 2017, Anuario de la minería de Chile, 2016 [Mining yearbook of Chile, 2016]: Santiago, Chile, Servicio Nacional de Geología y Minería, 259 p. (Accessed March 17, 2018, at http://www.sernageomin.cl/wp-content/uploads/2017/Anuario-2016-sernageomin.pdf.)
Sociedad Química y Minera de Chile S.A., 2017, Annual report 2016: Santiago, Chile, Sociedad Química y Minera de Chile S.A., 403 p. (Accessed May 1, 2019, at http://s1.q4cdn.com/793210788/files/doc_financials/2016/annual/Memoria-Anual-2016_ing_final.pdf.)
U.S. Central Intelligence Agency, 2018, Chile, *in* The World Factbook: U.S. Central Intelligence Agency, March. (Accessed March 23, 2018, at https://www.cia.gov/library/publications/the-world-factbook/geos/ci.html).
U.S. Department of Energy, 2016, Chile—Analysis: U.S. Department of Energy, December. (Accessed March 27, 2018, at https://www.eia.gov/beta/international/analysis.cfm?iso=CHL.)
U.S. Department of State, 2016, Chile—2016 investment climate statement: U.S. Department of State. (Accessed September 6, 2018, at https://www.state.gov/e/eb/rls/othr/ics/2016/wha/254515.htm.)

TABLE 1
CHILE: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons, gross weight, unless otherwise specified)

Commodity[2]		2012	2013	2014	2015	2016
METALS						
Copper:						
Mine, Cu content:						
Concentrates		3,405,100	3,843,100	3,917,100 r	3,993,700	3,892,300
Solvent extraction	thousand metric tons	2,029	1,933	1,844	1,778	1,660
Copper sulfate		8,814	8,869	10,292	9,496	11,410
Smelter, primary	thousand metric tons	1,342	1,358	1,356	1,496	1,491
Refinery, primary	do.	873	822	885	910	953
Gold, mine, Au content	kilograms	49,936	51,309	46,031	42,501	46,333
Iron ore, mine:						
Gross weight	thousand metric tons	17,330	17,109	18,866 r	15,448	15,506
Fe content	do.	9,429	9,088	10,149 r	9,148	9,009
Iron and steel:						
Pig iron	do.	1,068	766	584	644 r	678
Raw steel	do.	1,671	1,323	1,079	1,112	1,153
Lead, mine, Pb content		410	1,829	2,678	2,979	1,110
Mercury, Hg content		49	19	10 e	10 e	10 e
Molybdenum, mine:						
Gross weight, oxide		4,790	397	--	--	--
Mo content		35,090	38,715	48,770	52,579	55,834
Rhenium, Re content[e]	kilograms	27,000	25,000	25,000	26,000	26,000
Selenium, Se content	do.	75,000	--	--	--	--
Silver, mine, Ag content	do.	1,195,000	1,174,000	1,571,788 r	1,504,271 r	1,501,436
Zinc, mine, Zn content		26,762	29,759	45,094	48,071	42,870
INDUSTRIAL MINERALS						
Boron:						
Boric acid, H_3BO_3		97,235	91,252	94,986	101,170	104,299
Ulexite, natural		444,487	580,528	496,533	517,584	558,854
Cement, hydraulic	thousand metric tons	4,722	4,880 e	4,200 r, e	4,300 r, e	4,200 e
Clay and shale:						
Bauxitic clay		4,976	2,145	16,903	29,166	19,113
Bentonite		893	3,313	1,083	1,434	1,288
Kaolin		60,429	60,000	60,000	60,000	60,000
Other, including ball clay and plastic clay		1,940	--	--	--	--
Diatomite		23,021	27,092	31,000	26,186	26,937
Feldspar, mine		6,399	3,874	4,233	6,577	6,352
Gypsum		799,064	1,015,158	843,490	860,075	934,033
Iodine, elemental		17,494	20,656	18,989	21,179	18,444
Lime[e]	thousand metric tons	970	950	900	910	910
Lithium:						
Lithium carbonate		62,002	52,358	55,074	50,418	70,831
Lithium chloride		4,145	4,091	2,985	2,069	1,775
Lithium hydroxide		5,447	4,197	4,194	3,888	5,576
Nitrogen, nitrates, crude	thousand metric tons	823	760	722	795	806
Peat, horticultural use		346	527	2,276	2,306	3,621
Phosphate rock:						
Apatite:						
Gross weight		8,585	12,041	8,727	6,781	1,604
P_2O_5 content[e]		2,650	3,740	3,000	2,090	500
Guano		1,266	2,915	2,717	3,408	4,601
Phosphorite		5,720	--	11,415	9,360	--
Potash, products:						
Potassium chloride, KCl		1,581,226	1,838,735	1,759,490	1,775,974	1,964,201
Potassium sulfate, K_2SO_4		105,182	62,480	110,811	113,101	123,627
Pumice and related minerals, pumice and pozzolan		826,779	800,031	808,879	804,121	840,976

See footnotes at end of table.

TABLE 1—Continued

CHILE: PRODUCTION OF MINERAL COMMODITIES [1]

(Metric tons, gross weight, unless otherwise specified)

Commodity[2]		2012	2013	2014	2015	2016
Salt	thousand metric tons	8,057	6,577	10,533	11,831	8,140
Stone, sand, and gravel:						
Silica, mine production:						
Quartz		359,692	360,293	269,208	433,560	399,576
Silica sand		907,784	997,855	924,059	824,153	911,729
Stone, dimension:						
Marble		2,285	3,523	4,453	2,401	4,395
Travertine		4,467	5,599	4,176	2,999	3,292
Stone, size and shape unspecified, calcium carbonate:						
Coquina	thousand metric tons	375	182	510	506	481
Ground calcium carbonate	do.	44	26	26	44	49
Limestone	do.	6,238	6,246	6,314	6,147	6,846
Sulfur, byproduct, metallurgy	do.	1,681	1,771 r	1,849 r	1,800 r, e	1,800 e
Talc and related minerals, pyrophyllite		730	--	--	--	--
Zeolites		250	159	92	--	386
MINERAL FUELS AND RELATED MATERIALS						
Coal, bituminous[3]	thousand metric tons	712	2,902	4,168	3,162	2,525
Coke, metallurgical	do.	459	438	443	440 e	440 e
Methanol	do.	313	204	200	200 e	200 e
Natural gas	million cubic meters	1,626	1,166	907	1,044	1,175
Petroleum:						
Crude, including condensate	thousand 42-gallon barrels	1,072	2,765	2,499	1,796 r	1,503
Refinery production:						
Diesel, including distillate fuel oil	do.	21,436	22,932	23,458 r	22,339 r	21,357
Gasoline	do.	19,379	22,568	21,980 r	24,320 r	24,829
Kerosene	do.	5,548	5,500	5,742 r	5,327 r	5,264
Liquefied petroleum gas	do.	6,774	3,021	3,075 r	3,050 r	2,421
Residual fuel oil	do.	8,020	8,372	8,220 r	8,283 r	8,075
Other products	do.	6,611	6,600	12,816 r	6,377 r	4,717
Total	do.	67,800 r	69,000 r	75,300 r	69,700 r	66,700

[e]Estimated. [r]Revised. do. Ditto. NA Not available. -- Zero.

[1]Table includes data available through March 12, 2018. All data are reported unless otherwise noted. Totals and estimated data are rounded to no more than three significant digits; may not add to totals shown.

[2]In addition to the commodities listed, arsenic trioxide, barite, ferroalloys, hydraulic lime, lapiz lazuli, manganese, pyrite, sodium sulfate, and steel semimanufactures may have been produced in Chile, but available information was inadequate to make reliable estimates of output.

[3]Data may include production of subbituminous coal.

TABLE 2
CHILE: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities[1]	Annual capacity[e]
Barite	metric tons	Sociedad Minera Godoy Schwenger y Cía.	Hijuelas, Valparaiso (Region V)	400
Boron compounds, B_2O_3 content		Química Industrial del Bórax Ltda. (private, Chile-based investors, 100%)	Ulexite mine at Salar del Surire, and boric acid and agrochemical plants near Arica, Arica y Parinacota (Region XV)	550
Do.		S.Q.M. Salar S.A. [Sociedad Química y Minera de Chile S.A. (SQM), 100%]	Mine brines of Atacama Salar, and boric acid plant at Antofagasta, Region II	200
Do.		do.	Plant in Metropolitana de Santiago Region	NA
Calcium carbonate, natural		Minera El Way S.A. (Cementos Bío Bío S.A., 100%)	Quarry near Antofagasta, Region II	NA
Do.		Minera El Jilguero S.A. (Cementos Bío Bío S.A., 100%)	Quarry near Copiapo, Atacama (Region III)	NA
Do.		Minera Río Teno S.A. (Cementos Bío Bío S.A., 100%)	Quarry and plant at Teno, near Curico, Maule (Region VII)	NA
Do.		Minera Río Colorado S.A (Cementos Bío Bío S.A., 51%, and Soprocal Calerías e Industrias S.A., 49%)	La Perla Mine and plant near Melipilla, Metropolitana de Santiago Region	NA
Do.		Sociedad Minera Las Abuelitas Ltda. (Soprocal Calerías e Industrias S.A., 100%)	Mine and plant near Melipilla, Metropolitana de Santiago Region	NA
Do.		Minera Melón S.A. (Melón S.A., 100%)	Navío Mine near Quillota, Valparaiso (Region V)	NA
Do.		Alfredo Villalobos Román Tarsicio S.A.	Quarry and plant near Illapel, Coquimbo (Region IV)	NA
Do.		César B. Formas Ortiz S.A.	Plant at Chañaral, Atacama (Region III)	NA
Do.		Explotaciones de Minas Tongoy Ltda.	Quarry and plant near Tongoy, Coquimbo (Region IV)	NA
Do.		Imopac Ltda.	Plant at Vallenar, Atacama (Region III)	NA
Do.		Mario Alberto Pizarro A. S.A.	Plant at Los Vilos, Coquimbo (Region IV)	NA
Do.		Minera Trucco Ltda.	Mine and plant, Metropolitana de Santiago Region	NA
Do.		Cristalerías Toro S.A.I.C.	Plant at Santiago, Metropolitana de Santiago Region	NA
Do.		Sociedad Minera Godoy Schwenger y Cía.	Mine and plant near Quillota, Valparaiso (Region V)	NA
Do.		Compañía Minera Feltre Ltda.	Plant at Santiago, Metropolitana de Santiago Region	NA
Do.		Compañía Minera Saturno Ltda.	do.	NA
Do.		Unimin Chile Ltda.	do.	NA
Do.		Sociedad Minera y Comercial Alegría y Cia Ltda.	Mine and plant at Coquimbo (Region IV)	NA
Do.		Sociedad Contractual Minera Pirineos	Quarry and plant at Vallenar, Atacama (Region III)	NA
Do.		Cemento Polpaico S.A. (Holcim Ltd., 54.3%; Compañía de Consumidores de Gas de Santiago, 40.9%; other, 4.8%)	Cerro Blanco plant, Metropolitana de Santiago Region; Mejillones plant, Antofagasta (Region II); Coronel plant, Biobio (Region VIII)	NA
Cement		Melón S.A. (Inversiones Brescia S.A., 99.24%, and other private, 0.76%)	La Calera plant, Valparaiso (Region V), and grinding plant at Puerto Montt, Los Lagos (Region X)	1,800
Do.		Cementos Bío Bío S.A. (private, 100%)	Talcahuano plant, Biobio (Region VIII)	750
Do.		do.	Grinding plant at San Antonio, Valparaiso (Region V)	300
Do.		Industria Nacional de Cemento S.A. (INACESA), 100%	Plant near Antofagasta City, Antofagasta (Region II)	500
Do.		do.	Plant near Curico City, Maule (Region VII)	1,700
Clay:				
Bentonite	metric tons	Sociedad Legal Minera Mabel Dos Primera de Arica	Quarry and plant near Arica, Arica y Parinacota (Region XV)	1,500
Kaolin		Compañía Minera Polpaico Ltda.	El Guindo Mine and a plant in the Metropolitana de Santiago Region	NA
Do.		Minera Lealtad Ltda.	Mine and plant at Til Til, Metropolitana de Santiago Region	NA
Do.	metric tons	Mario Alberto Pizarro A.S.A.	Plant at Los Vilos, Coquimbo (Region IV)	600
Unspecified		Sociedad Minera Casablanca S.A.	Quarry and plant in Metropolitana de Santiago Region	NA
Do.		Sociedad Minera Godoy Schwenger y Cía.	Quarry and plant near Quillota, Valparaiso (Region V)	NA
Do.		Minera Lealtad Ltda.	Quarry and plant at Til Til, Metropolitana de Santiago Region, and at Olmue, Valparaiso (Region V)	NA
Coal		Ingeniería del Sur S.A.	Pecket deposit, Magallanes coal basin, Magallanes y de la Antartica Chilena (Region XII)	600
Do.		Mina Invierno S.A. (Empresas Copec S.A., 50%, and Ultramar Shipping Co., 50%)	Mina Invierno, Isla Riesco coal basin, Magallanes y de la Antartica Chilena (Region XII)	4,000

See footnotes at end of table.

TABLE 2—Continued
CHILE: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities[1]	Annual capacity[e]
Coal—Continued			
Do.	Carbonifera Cocke Car Ltda.	Don Pedro, Coronel, Biobio (Region VIII)	24
Do.	Pacheco y Burdiles Ltda.	El Sarco, Biobio (Region VIII)	NA
Copper, Cu content	Anglo American Sur S.A. (Anglo American plc, 50.1%; Mitsubishi Corp., 20.4%; Corporación Nacional del Cobre, 20%; Mitsui & Co., Ltd., 9.5%)	Los Bronces Mine (concentrates) and SX–EW² plant, Metropolitana de Santiago Region	370
Do.	Antofagasta Minerals S.A. (Antofagasta plc, 60%; JX Nippon Mining & Metals Corp., 25%; Mitsubishi Materials Corp., 15%;	Los Pelambres open pit mine and concentration plant, Coquimbo (Region IV)	370
Do.	Antofagasta Minerals S.A. (Antofagasta plc, 70%, and Marubeni Corp., 30%)	Centinela oxide and sulfide mines and plant, Antofagasta (Region II)	80
Do.	Antofagasta Minerals S.A. (Antofagasta Minerals Plc, 50%, and Barrick Gold Corp., 50%	Zaldivar open pit mine and SX–EW² plant, Antofagasta (Region II)	100
Do.	Antofagasta Minerals Plc, 70%, and Marubeni Corp., 30%	Antucoya open pit mine and SX–EW² plant, Antofagasta (Region II)	85
Do.	Cía. Contractual Minera Candelaria (Lundin Mining Corp., 80%; Sumitomo Metal Mining Co. Ltd., 16%; Sumitomo Corp., 4%)	Candelaria open pit mine, underground mine, and concentration plant, near Copiapo, Atacama (Region III)	145
Do.	Compañía Minera Cerro Colorado Ltda. (BHP Billiton Ltd., 100%)	Cerro Colorado Mine and SX–EW² plant, Tarapaca (Region I)	80 [1]
Do.	Compañía Minera Doña Inés de Collahuasi SCM (Anglo American plc, 44%; Glencore plc, 44%; companies led by Mitsui & Co. Ltd., 12%)	Collahuasi open pit mine, concentration plant, and SX–EW² plant, at Ujina, Tarapaca (Region I)	6
Do.	Compañía Minera Carmen de Andacollo [Teck Resources Ltd., 90%, and Empresa Nacional de Minería (ENAMI) (Government, 100%), 10%]	Carmen de Andacollo Mine and SX–EW² plant, Coquimbo (Region IV)	4
Do.	Compañía Minera Quebrada Blanca [Teck Cominco Ltd., 76.5%; Inversiones Mineras S.A., 13.5%; Empresa Nacional de Minería (ENAMI) (Government, 100%), 10%]	Quebrada Blanca open pit mine and SX–EW² plant, Tarapaca (Region I)	35
Do.	Complejo Metalurgico Altonorte S.A. (Glencore plc, 100%)	Altonorte smelter, La Negra, Antofagasta (Region II)	300
Do.	Compañía Minera Minera Lomas Bayas (Glencore plc, 100%)	Lomas Bayas Mine and SX–EW² plant, Antofagasta (Region II)	75
Do.	Corporación Nacional del Cobre (CODELCO) (Government, 100%)	Chuquicamata Division, including Chuquicamata and Mina Sur Mines; Chuquicamata SX–EW² plant, smelter, and refinery, Antofagasta (Region II)	80
Do.	do.	Radomiro Tomic Division and Mine, and Radomiro Tomic SX–EW² plant; Ministro Hales Mine and SX–EW² plant Antofagasta (Region II)	230
Do.	do.	El Teniente Division and Mine, and Caletones smelter and refinery, Libertador General Bernardo O'Higgins (Region VI)	470
Do.	do.	Ventanas Division, Las Ventanas smelter and refinery, Valparaiso (Region V)	410
Do.	do.	Andina Division, including Rio Blanco and Sur Sur Mines, Valparaiso (Region V)	220
Do.	do.	El Salvador Division, including Campamento Antiguo and Damiana Norte open pit mines; Inca underground mine, Atacama (Region III)	15
Do.	do.	Potrerillos refinery and smelter, Salvador Division, Atacama (Region III)	160

See footnotes at end of table.

TABLE 2—Continued
CHILE: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities[1]	Annual capacity[e]
Copper, Cu content—Continued		Empresa Minera de Mantos Blancos S.A. (Consortium led by Audley Capital Advisors LLP)	Mantos Blancos open pit mine and SX–EW² plant, Antofagasta (Region II)	25
Do.		do.	Mantoverde open pit mine and SX–EW² plant, Atacama (Region III)	50
Do.		Empresa Nacional de Minería (ENAMI) (Government, 100%)	Hernán Videla Lira smelter, Paipote, Atacama (Region III)	80
Do.		Lundin Mining Corp., 80%; Sumitomo Metal Mining Co. Ltd., 16%; Sumitomo Corp., 4%	Ojos del Salado Mine and concentration plant, near Copiapo, Atacama (Region III)	25
Do.		Minera El Tesoro S.A. (Antofagasta plc, 70%, and Marubeni Corp., 30%)	El Tesoro open pit mine and SX–EW² plant, Antofagasta (Region II)	70
Do.		Minera Escondida Ltda. (BHP Billiton Ltd., 57.5%; Rio Tinto plc, 30%; Japan Escondida Corp., 10%; International Finance Corp., 2.5%)	Escondida open pit mine, two concentrator plants, an oxide plant for cathode production (SX–EW²), and a sulfide-leach plant for cathode production, Antofagasta (Region II)	300
Do.		Minera Gaby S.p.A. [Corporación Nacional del Cobre (CODELCO) (Government, 100%), 100%]	Gabriela Mistral Mine and SX–EW² plant, Sierra Gorda, Antofagasta (Region II)	130
Do.		Minera Spence S.A. (BHP Billiton Ltd., 100%)	Spence Mine and SX–EW² plant, Antofagasta (Region II)	200
Do.		Sociedad Contractual Minera El Abra [Freeport-McMoRan Inc., 51%, and Corporación Nacional del Cobre (CODELCO) (Government, 100%), 49%]	El Abra Mine and SX–EW² plant, near Calama, Antofagasta (Region II)	120
Do.		Sociedad Punta del Cobre S.A., 100%	Punta del Cobre Mine, 17 km southeast of Copiapo, Atacama (Region III)	6
Copper sulfate	metric tons	Compañía Minera Cerro Negro	Portales Mine and a plant at Cabildo, Valparaiso (Region V)	200
Do.	do.	Minera Capacho Viejo Ltda.	Mine and plant near Tocopilla, Antofagasta (Region II)	5,000
Do.	do.	Compañía Minera San Gerónimo	Mine and plant near Coquimbo (Region IV)	10,000
Diatomite		Celite Chile Ltda. (IMERYS S.A., 100%)	Plant at Port of Arica, and mining operations nearby in Regions I and XV	30
Feldspar		Minera Alfa Quintay Ltda.	Quarry and plant, Metropolitana de Santiago Region	NA
Do.		J.B. Schiappacase A.	Quarry and plant near Limache, Valparaiso (Region V)	NA
Do.		Minera Pacífico Ltda.	Quarries and plants in Libertador General Bernardo O'Higgins (Region VI), and plant in Metropolitana de Santiago Region	NA
Ferromolybdenum		Molibdenos y Metales S.A. (MOLYMET) (private, 100%)	Nos plant 30 km south of Santiago and Molynor Industrial Complex, Antofagasta	25
Gold, mine output	kilograms	do.	Andina, Chuquicamata, El Teniente, Radomiro Tomic, and Salvador Divisions (byproduct of copper production)	2,000
Do.	do.	Minera Escondida Ltda., 100%	Escondida copper mine and plants, Antofagasta (Region II)	4,500
Do.	do.	Cía. Contractual Minera Candelaria, 100%	Candelaria copper mine and plant, Atacama (Region III)	2,500
Do.	do.	Lundin Mining Corp., 80%; Sumitomo Metal Mining Co. Ltd., 16%; Sumitomo Corp., 4%	Ojos del Salado copper mine and plant, Atacama (Region III)	600
Do.	do.	Antofagasta plc, 60%; JX Nippon Mining Metals Corp, 15%; Mitsubishi Materials Corp., 10%; Marubeni Corp., 8.75%; Mitsubishi Corp., 5%; Mitsui & Co. Ltd., 1.25%	Los Pelambres Mine and plant, Coquimbo (Region IV)	1,700
Do.	do.	Empresa Nacional de Minería (ENAMI) (Government, 100%)	Manuel Antonio Matta plant, Paipote; Osvaldo Martínez plant, El Salado; and Vallenar plant, Atacama (Region III); and José Antonio Moreno plant, Taltal, Antofagasta (Region II)	400
Do.	do.	Compañía Minera Doña Inés de Collahuasi SCM, 100% (Anglo American plc, 44%; Glencore plc, 44%; companies led by Mitsui & Co. Ltd., 12%)	Collahuasi Mine and plants, Tarapaca (Region I)	NA

See footnotes at end of table.

TABLE 2—Continued
CHILE: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities[1]	Annual capacity[e]
Gold, mine output—Continued	kilograms	Compañía Minera Mantos de Oro (Kinross Gold Corp., 100%)	La Coipa Mine and plant, Atacama (Region III), 140 km north of Copiapo	6,000
Do.	do.	Compañía Minera Maricunga (Kinross Gold Corp., 100%)	Maricunga open pit, heap-leach mine, Atacama (Region III), 100 km east of Copiapo	7,500
Do.	do.	Minera Meridian Ltda. (Yamana Gold Inc., 100%)	El Peñón Mine and concentration plant, Antofagasta (Region II)	10,500
Do.	do.	Minera Esperanza S.A. (Antofagasta plc, 70%, and Marubeni Corp., 30%)	Esperanza sulfides mine and milling-flotation plant, Antofagasta (Region II)	8,000
Do.	do.	Minera Florida S.A. (Yamana Gold Inc., 100%)	Minera Florida Mine and concentration plant, Metropolitana de Santiago Region	3,100
Do.	do.	Compañía Minera Cerro Bayo Ltda. (Mandalay Resources Corp., 100%)	Cerro Bayo Mine and concentration plant, Aysen (Region XI)	950
Do.	do.	Sociedad Contractual Minera El Toqui Ltda. (Nyrstar NV, 100%)	El Toqui Mine and Doña Rosa concentration plant, Aysen (Region XI), 120 km north of Coyhaique	1,600
Do.	do.	Atacama Pacific Gold Corp., 100%	El Durazno small tonnage mine, 173 km north of Santiago, Coquimbo (Region IV)	NA
Do.	do.	Lachlan Star Ltd., 100%	CMD Mine, 40 km southeast of Coquimbo, Coquimbo (Region IV)	NA
Do.	do.	Xtract Resources Plc, 100%	Chépic Mine, 19 km northwest of Talca, Maule (Region VII)	NA
Gypsum, natural		Compañía Industrial El Volcán S.A. (Saint-Gobain Gypsum S.A., 100%)	El Volcan quarry near Santiago, Metropolitana de Santiago Region	100
Do.		Compañía Minera Romeral S.A. (Etex Group S.A., 59.8%, and Melón S.A., 40.2%)	El Romeral quarry near Santiago, Metropolitana de Santiago Region	50
Do.		Minera Lo Valdés Ltda.	Metropolitana de Santiago Region	NA
Do.		Compañía Minera Polpaico Ltda.	Yeso Norte Mine, Antofagasta (Region II)	NA
Do.		Industria Nacional de Cemento S.A. (INACESA), 100%	Mantos verdes quarry near Antofagasta City, Antofagasta (Region II)	NA
Do.		Antonio Zotti Rosetti y Cía. Sociedad Minera	La Confianza and San Jose Mines near Los Vilos, Coquimbo (Region IV); Margarita and San Nicolas Mines, and a plant near Renca, Metropolitana de Santiago Region	NA
Iodine	metric tons	SQM Químicos S.A. [Sociedad Química y Minera de Chile S.A. (SQM), 100%]	Nueva Victoria Mine and plant and Iris plant, Tarapaca (Region I); El Toco Mine and María Elena plant; and Pampa Blanca and Pedro de Valdivia Mines and plants, Antofagasta (Region II)	10,000 [5]
Do.	do.	Atacama Chemical S.A. (Cosayach) (Inverraz S.A., 100%)	Mine and plant near Iquique, Tarapaca (Region I)	3,000
Do.	do.	Atacama Minerals Chile Minera (SCM Bullmine and RB Energy)	Mine and plant in Aguas Blancas, Antofagasta (Region II)	2200
Do.	do.	Algorta Norte S.A. (Inversiones Minerales SA, 74.5%, and Toyota Tsusho Corp., 25.5%)	Baquedano, Sierra Gorda, Antofagasta (Region II)	4,000
Do.	do.	Minera Centinela S.A. (Antofagasta plc, 70%, and Marubeni Corp., 30%)	Esperanza mine and milling-flotation plant, Antofagasta (Region II)	8,000
Do.		ACF Minera S.A	Lagunas Mine, Iquique, Tarapaca (Region I)	NA
Iron ore, Fe content		Compañía Minera del Pacífico S.A. (CMP) (CAP S.A., 75%, and Mitsubishi Corp., 25%)	Cristales, Cerro Negro Norte, and El Algarrobo Mines, El Algarrobito and Huasco concentration plants, Huasco pellets plant, and Los Colorados Mine and concentration plant, Atacama (Region III); El Romeral and El Tofo Mines, and El Romeral concentration and pellet-feed plants, Coquimbo (Region IV); and El Laco concentration plant, Antofagasta (Region II)	13,000

See footnotes at end of table.

TABLE 2—Continued
CHILE: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities[1]	Annual capacity[e]
Iron ore, Fe content —Continued		Compañía Minera del Pacífico S.A. (CMP) (CAP S.A., 75%, and Mitsubishi Corp., 25%)	Magnetite plant to process tailings from the Candelaria Mine and other iron-bearing raw materials from third parties, near Copiapo, Atacama (Region III)	2,000
Do.		Minera Santa Fe SCM, 100%	Carmen Mine, near Copiapo, Atacama (Region III)	2,000
Do.		Santa Fe Mining (JSW Steel Ltd., 70%, and Minera Santa Fe SCM, 30%)	Bellavista Mine, near Copiapo, Atacama (Region III)	1,000
Iron and steel:				
Pig iron		Cía. Siderúrgica Huachipato S.A. (subsidiary of CAP S.A.) (private, 100%)	Plant in Bahia de San Vicente, Biobio (Region VIII), 14 km northeast of Concepcion	1,200
Steel, crude		Compañía Siderúrgica Huachipato S.A. (subsidiary of CAP S.A.) (private, 100%)	Primary plant in Talcahuano and plant in Rengo, Biobio (Region VIII)	1,500
Do.		Gerdau AZA S.A.	Steel plants in Renca and Colina, Metropolitana de Santiago Region	520
Lead, mine output		Minera Florida S.A. (Yamana Gold Inc., 100%)	Minera Florida Mine and concentration plant, Metropolitana de Santiago Region	NA
Do.	metric tons	Sociedad Contractual Minera El Toqui Ltda. (Laguna Gold, 100%)	El Toqui Mine and Doña Rosa concentration plant, Aysen (Region XI), 120 km north of Coyhaique	3,000
Lime, hydraulic		Cales Inacesa S.A. (INACESA) (Cementos Bío Bío S.A., 100%)	Plants near Antofagasta City, Antofagasta (Region II), and near Copiapo City, Atacama (Region III)	1100
Do.		Soprocal Calerías e Industrias S.A.	Plant at Melipilla, Metropolitana de Santiago Region	165
Lithium carbonate	metric tons	Rockwood Lithio Ltda. (Albemarle Corp., 100%)	Chemetall Foote plant at La Negra, near Antofagasta City, Antofagasta (Region II)	26,000
Do.	do.	S.Q.M. Salar S.A. [Sociedad Química y Minera de Chile S.A. (SQM), 100%]	Plant at Salar del Carmen, near the city of Antofagasta, Antofagasta (Region II)	48,000
Lithium chloride	do.	Rockwood Lithio Ltda. (Albemarle Corp., 100%)	Chemetall Foote plant at La Negra, near Antofagasta City, Antofagasta (Region II)	6,000
Lithium hydroxide		S.Q.M. Salar S.A. [Sociedad Química y Minera de Chile S.A. (SQM), 100%]	Mine brines of Atacama Salar, and boric acid plant at Antofagasta, Region II	6,000
Marble, dimension stone	do.	Pier Luigi Indri S.A.	Quarry at Cerrillos, Atacama (Region III)	250
Do.	do.	Compañía Minera Feltre Ltda.	Quarry and plant in Atacama (Region III)	1,400
Methanol		Methanex Chile S.A. (Methanex Corp., 100%)	Two methanol plants at Cabo Negro, near Punta Arenas City, Magallanes y de la Antartica Chilena (Region XII)	3,800
Molybdenum, mine output	metric tons	Anglo American Sur S.A. (Anglo American plc, 50.1%; Mitsubishi Corp., 20.4%; Corporación Nacional del Cobre, 20%; Mitsui & Co., Ltd., 9.5%)	Los Bronces Mine and Tortolas molybdenum flotation plant, Metropolitana de Santiago Region	3,000
Do.	do.	Corporación Nacional del Cobre (CODELCO) (Government, 100%)	Chuquicamata and Radomiro Tomic Divisions, Antofagasta (Region II)	20,000
Do.	do.	do.	El Teniente Mine and plant, Libertador General Bernardo O'Higgins (Region VI)	6,500
Do.	do.	do.	Andina Division, Atacama (Region III)	5,000
Do.	do.	do.	El Salvador Division, Atacama (Region III)	1,500
Do.	do.	Minera los Pelambres S.A. (Antofagasta plc; 60%; JX Nippon Mining Metals Corp, 15%; Mitsubishi Materials Corp., 10%; Marubeni Corp., 8.75%; Mitsubishi Corp., 5%; Mitsui & Co. Ltd., 1.25%	Los Pelambres Mine and plant, Coquimbo (Region IV)	12,500
Do.	do.	Compañía Minera Doña Inés de Collahuasi SCM, 100% (Anglo American plc, 44%; Glencore plc, 44%; companies led by Mitsui & Co. Ltd., 12%)	Collahuasi Mine and molybdenum plant, Tarapaca (Region I)	6,000
Do.	do.	Molyb Ltda. (Corporación Nacional del Cobre (CODELCO) (Government, 100%)	Mejillones, Antofagasta Region (Region II)	16,500

See footnotes at end of table.

TABLE 2—Continued
CHILE: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities[1]	Annual capacity[e]
Phosphatic materials, natural:			
Guano	Guano Rojo Punta Gruesa Ltda.	Mine and plant near Iquique, Tarapaca (Region I)	3
Phosphate rock, apatite	César B. Formas Ortiz S.A.	Mine near Chañaral, Antofagasta (Region II)	20
Do.	Compañía Minera El Sauce Ltda.	Mine near La Serena, Coquimbo (Region IV)	5
Phosphorite	Compañía Minera de Fosfatos Naturales Ltda. (Bifox Ltda.) (TEHMCORP S.A., 100%)	Mines at and around Bahia Inglesa; Osorno plant near Bahia Inglesa, Atacama (Region III); and Bahia Inglesa plant at Caldera, Coquimbo (Region IV)	45
Do.	Sociedad Contractual Minera Bahía Inglesa	Selaqueos Mine near Bahia Inglesa, Atacama (Region III)	NA
Potash (KCl and K_2SO_4), K_2O content	SQM Salar S.A. [subsidiary of Sociedad Química y Minera de Chile S.A. (SQM)] (private, 100%)	A dual-use plant and three KCl plants at Salar del Carmen, near the city of Antofagasta, Antofagasta (Region II)	2,600
Do.	Rockwood Lithio Ltda. (Albemarle Corp., 100%)	Chemetall Foote plant at La Negra, Antofagasta (Region II); and Salar de Atacama, Atacama (Region III)	50
Potassium chloride (KCl)	Sociedad Contractual Minera Virginia (Inverraz S.A., 100%)	Mine and plant near Iquique, Tarapaca (Region I)	NA
Do.	ACF Minera S.A.	Lagunas Mine and plant near Iquique, Tarapaca (Region I)	95
Potassium sulfate (K_2SO_4)	do.	Lagunas Mine and plant near Iquique, Tarapaca (Region I)	95
Pumicite, including pozzolan	Minera Melon S.A.	Quarry at Rinconada Lo Vial near Maipu, and plant at Santiago, Metropolitana de Santiago Region	1,200
Do.	Compañía Minera Polpaico Ltda.	Puzolana Norte Mine, Antofagasta (Region II); and Puzolana Pudahuel Mine and a plant in the Metropolitana de Santiago Region	NA
Do.	Minera Río Teno S.A. (Cementos Bío Bío S.A., 100%)	Quarry and plant near Curico, Libertador General Bernardo O'Higgins (Region VI)	200
Do.	Minera El Way S.A. (Cementos Bío Bío S.A., 100%)	Quarries and plant near Antofagasta (Region II)	100
Do.	Imerys Minerales Santiago Ltda. (IMERYS S.A., 100%)	Laguna del Maule Mine at Talca, Maule (Region VII), and plant at Santiago, Metropolitana de Santiago Region	NA
Rhenium, metal kilograms	Molibdenos y Metales S.A. (MOLYMET) (private, 100%)	Nos plant, San Bernardo, Metropolitana de Santiago Region	30,000
Do. do.	Molyb Ltda. (Corporación Nacional del Cobre (CODELCO) (Government, 100%)	Mejillones, Antofagasta Region (Region II)	8,000
Salt, NaCl	Sociedad Minera Punta de Lobos S.A. (K+S Aktiengesellschaft, 100%)	Open pit mine in the Salar Grande de Tarapaca, Tarapaca (Region I), and port facilities at Puerto Patillos	8,000
Do.	Benjamín Nuñez Ltda.	Mine near Iquique, Tarapaca (Region I)	NA
Do.	Inversiones Alpina Ltda.	Mine in the Salar Grande Irlanda and plant at Iquique, Tarapaca (Region I)	NA
Do.	Playa Grande Ltda.	Mine in Tarapaca (Region I)	NA
Do.	José Álvarez Jara Ltda.	do.	NA
Do.	Christian Fletcher Ltda.	do.	NA
Do.	Elías Echeverría Ltda.	do.	NA
Do.	Cía. Minera Cordillera Chile S.C.M.	do.	NA
Silica, quartz	Cedric Fernández y Compañía Ltda.	Mine and plant near Calama, Antofagasta (Region II)	100
Do.	Antonio Zotti Rosetti y Cía. Sociedad Minera	La Confianza and San Jose Mines near Los Vilos, Coquimbo (Region IV); Margarita and San Nicolas Mines, and a plant near Renca, Metropolitana de Santiago Region	20
Do.	Minera Granos Industriales Ltda.	El Turco Mine and Migrin Plant near Cartagena, Valparaiso (Region V)	250
Do.	Productora Cuarzo El Peral Ltda.	El Peral Mine and plant near Cartagena, Valparaiso (Region V)	250
Do.	Minera Alfa Quintay Ltda.	Quarry and plant, Metropolitana de Santiago Region	30
Do.	Minera Pacífico Ltda.	do.	NA

See footnotes at end of table.

TABLE 2—Continued
CHILE: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities[1]	Annual capacity[e]
Silica, quartz—Continued		Sociedad Legal Minera Pedro Luís	Mine and plant near Copiapo, Atacama (Region III)	120
Do.		Minera San Pedro Ltda.	Natacha Mine and El Rulo plant at Til-Til, Metropolitana de Santiago Region	30
Do.		SLM Santa Dorila de las Arenitas	Mine and plant at Constitucion, Maule (Region VII)	250
Do.		Cristalerías Toro S.A.	Mine at Rancagua, Libertador General Bernardo O'Higgins (Region VI)	120
Do.		Vidrios Lirquén S.A.	Mine and glass plant at Lirquen, Biobio (Region VIII)	80
Do.		Minera Arsil S.A.	Mine and plant at Concepcion, Biobio (Region VIII)	50
Silver:				
Metal grains	kilograms	Corporación Nacional del Cobre (CODELCO) (Government, 100%)	Ventanas refinery, Valparaiso (Region V)	220,000
Mine output	do.	do.	Andina, Chuquicamata, El Teniente, Radomiro Tomic, and Salvador Divisions (byproduct of copper production)	300,000
Do.	do.	Compañía Minera Mantos de Oro (Kinross Gold Corp., 100%)	La Coipa Mine and plant, Atacama (Region III), 140 km north of Copiapo	150,000
Do.	do.	Minera Meridian Ltds. (Yamana Gold Inc., 100%)	El Peñón Mine and concentration plant, Antofagasta (Region II)	300,000
Do.	do.	Minera Florida Ltda. (Yamana Gold Inc., 100%)	Minera Florida Mine and concentration plant, Metropolitana de Santiago Region	31,000
Do.	do.	Minera Escondida Ltda., 100%	Escondida copper mine and plants, Antofagasta (Region II)	180,000
Do.	do.	Empresa Nacional de Minería (ENAMI) (Government, 100%)	Manuel Antonio Matta plant, Paipote; Osvaldo Martínez plant, El Salado; Vallenar plant, Atacama (Region III); and José Antonio Moreno plant, Taltal, Antofagasta (Region II)	6,000
Do.	do.	Compañía Minera Cerro Bayo Ltda. (Mandalay Resources Corp., 100%)	Cerro Bayo Mine and concentration plant, Aysen (Region XI)	110,000
Do.	do.	Compañía Minera Doña Inés de Collahuasi SCM, 100% (Anglo American plc, 44%; Glencore plc, 44%; companies led by Mitsui & Co. Ltd., 12%)	Collahuasi Mine and plants, Tarapaca (Region I)	60,000
Do.	do.	Antofagasta plc, 60%; JX Nippon Mining Metals Corp, 15%; Mitsubishi Materials Corp., 10%; Marubeni Corp., 8.75%; Mitsubishi Corp., 5%; Mitsui & Co. Ltd., 1.25%	Los Pelambres Mine and plant, Coquimbo (Region IV)	42,000
Do.	do.	Anglo American Sur S.A. (Anglo American plc, 50.1%; Mitsubishi Corp., 20.4%; Corporación Nacional del Cobre, 20%; Mitsui & Co., Ltd., 9.5%)	Los Bronces Mine and plants, Metropolitana de Santiago Region	35,000
Do.	do.	Compañia Contractual Minera Candelaria, 100%	Candelaria Mine and concentration plant, Atacama (Region III)	30,000
Do.	do.	Lundin Mining Corp., 80%; Sumitomo Metal Mining Co. Ltd., 16%; Sumitomo Corp., 4%	Ojos del Salado copper mine and plant, Atacama (Region III)	4,500
Do.	do.	Sociedad Contractual Minera El Toqui Ltda. (Nyrstar NV, 100%)	El Toqui Mine and Doña Rosa concentration plant, Aysen (Region XI), 120 km north of Coyhaique	11,000
Sodium sulfate	metric tons	SQM Químicos S.A. [Sociedad Química y Minera de Chile S.A. (SQM), 100%]	Nueva Victoria Mine, Tarapaca (Region I), and Maria Elena Mine and Coya Sur plant, Antofagasta (Region II)	80,000
Do.	do.	Sociedad Legal Minera Santa Inés Uno de Antofagasta	Santa Ines Mine near Antofagasta (Region II)	150

See footnotes at end of table.

TABLE 2—Continued
CHILE: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities[1]	Annual capacity[e]
Stone, dimension:				
Dolomite		Minera El Jilguero S.A. (Cementos Bío Bío S.A., 100%)	Quarries and plant near Copiapo, Atacama (Region III)	30
Marble	metric tons	Pier Luigi Indri S.A.	Quarry at Cerrillos, Atacama (Region III)	250
Do.	do.	Compañía Minera Feltre Ltda.	Quarry and plant in Atacama (Region III)	1,400
Travertine	do.	Mármoles San Marino Chile S.A. (Grupo San Marino S.A., 100%)	Quarry near Calama, Antofagasta (Region II), and plant in Til-Til, Metropolitana de Santiago Region	7,000
Do.	do.	Andes Travertine & Stones S.A.	Quarry and plant in Antofagasta (Region II)	NA
Do.	do.	Canteras de Atacama S.A.	Quarry and plant at Calama, Antofagasta (Region II)	6,000
Sulfur, sulfuric acid		Complejo Metalurgico Altonorte S.A. (Glencore plc, 100%)	Altonorte smelter, Antofagasta (Region II)	900
Do.		Anglo American Sur S.A. (Anglo American plc, 50.1%; Mitsubishi Corp., 20.4%; Corporación Nacional del Cobre, 20%; Mitsui & Co., Ltd., 9.5%)	Chagres smelter, Valparaiso (Region V)	500
Do.		Corporación Nacional del Cobre (CODELCO) (Government, 100%)	Ventanas sulfuric acid plant, Valparaiso (Region V)	380
Do.		do.	Caletones plant, Libertador General Bernardo O'Higgins (Region VI)	1,000
Do.		do.	Portrerillos plant, Atacama (Region III)	100
Do.		Empresa Nacional de Minería (ENAMI) (Government, 100%)	Hernán Videla Lira smelter, Paipote, Atacama (Region III)	290
Talc	metric tons	Sociedad Talco Eduardo Martín Abejón Ltda.	Mines near Constitucion, Maule (Region VII), and plant at Santiago, Metropolitana de Santiago Region	1,000
Do.	do.	Minera Trucco Ltda.	Mine and plant near Santiago, Metropolitana de Santiago Region	NA
Zeolites	do.	Sociedad Legal Minera Serrín Tercera	Serrin Tercera Mine and Remulcao Plant at Talca, Maule (Region VII)	300
Zinc, mine, concentrate, Zn content	do.	Sociedad Contractual Minera El Toqui Ltda. (Nyrstar NV, 100%)	El Toqui Mine and Doña Rosa concentration Aysen (Region XI), 120 km north of Coyhaique	35,000
Do.	do.	Minera Florida S.A. (Yamana Gold Inc., 100%)	Minera Florida Mine and concentration plant, Metropolitana de Santiago Region	6,500

[e]Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.
[1]Abbreviations used for units of measure in this table include the following: km, kilometers.
[2]Solvent extraction and electrowinning.
[3]Concentrates.
[4]On care-and-maintenance status.
[5]Mining operations at the Pampa Blanca, El Toco, and Pedro de Valdivia were suspended in 2010, 2013, and 2015, respectively.

TABLE 3
CHILE: RESERVES OF MAJOR MINERAL COMMODITIES

(Thousand metric tons unless otherwise specified)

Commodity		Reserves[1]
Coal, all types	million metric tons	389 [2]
Copper, Cu content	do.	167
Gold, Au content	metric tons	998
Iodine		614
Iron ore, Fe content	million metric tons	7,300 [e]
Lithium, Li content		7,500 [3]
Molybdenum, Mo content		1,400
Nitrates		85,600
Silver, Ag content	metric tons	25,542

[e]Estimated. do. Ditto.

[1]Source: Servicio Nacional de Geología y Minería (SERNAGEOMIN), Anuario de la Minería de Chile, 2016.

[2]Source: Empresa Copec, Annual report 2016. Reserves at Mina Invierno.

[3]Source: U.S. Geological Survey Mineral Commodity Summaries 2017.