

THE MINERAL INDUSTRY OF PHILIPPINES

By Travis Q. Lyday

Agriculture was most important to the Philippine's economy; rice, fruit, and coconut were the major cash crops. The mining and quarrying sector of the minerals industry continued to decline in importance, contributing less than 1.5% to the country's gross domestic product in 1995. Although copper and gold remained the backbone of the country's mineral sector, production has been hampered for several years by the effects of natural disasters—including intense volcanic activity, cyclonic storms resulting in severe flooding, and periods of extensive drought—along with low international prices, and an inadequate mining law. Additionally, foreign investment was impeded by the requirement for 60% domestic equity control and high excise taxes (mineral royalties) on production.

The President of the Philippines on March 3, 1995, signed into law Republic Act 7942, an *Act Instituting a New System of Mineral Resources, Exploration, and Conservation*. This long-awaited landmark piece of legislation, more commonly referred to as the Philippine Mining Act of 1995, had been sought by the Philippine mining industry through the Philippine Chamber of Mines for nearly a decade—since ratification of the Philippine Constitution in 1987. Along with the Excise Tax Act of 1994 that reduced excise tax (royalty) rates on metallic and industrial minerals and quarry resources, these measures were expected to enable the domestic mining industry to regain its competitiveness. Small-scale mining was not affected by the new mining act; this sector still was to be governed by Republic Act 7076, the Small-Scale Mining Act.

The new mining code allowed companies (contractors) to obtain an exploration permit granting them the right to explore for all minerals within a specified area for up to 4 years (initially 2 years, but renewable for another 2 years). Upon finding a viable deposit, the code provided four basic types of production agreements, with a duration of up to 50 years (initially 25 years, renewable for another 25 years):

1. Mineral production sharing agreement. The contractor would provide all of the necessary financing, technology, personnel, and management; and the Government would receive a share of the gross output as excise tax revenue.

2. Coproduction agreement. The Government would enter into a negotiated agreement with the contractor, providing input into the operation apart from the mineral resource itself (the Government already has ownership of the minerals) in exchange for a share percentage of the gross production; the

Government also would receive excise taxes, the contractor's income tax, withholding tax, and any other taxes and fees required by law.

3. Joint-venture agreement. Both the Government and the contractor would hold equity shares in the project, with the Government entitled to its share of the gross production, as agreed, in addition to all taxes and fees relative to the mining output.

4. Financial or technical assistance agreement (FTAA). The FTAA was designed to encourage large-scale projects requiring an investment of at least US\$25 million. Unlike the other types of agreement that only allow for a 40% equity interest, the FTAA would allow an initial 100% foreign ownership; however, this would have to be divested to 40% 10 years after preoperating expenses had been recovered.

The new mining code also provided for several incentives to encourage mining, including a 4-year income tax holiday; tax- and duty-free capital equipment imports; value-added tax exemptions; income tax deductions where operations are posting losses; and accelerated depreciation. In addition, the Government also has guaranteed the right of repatriation of the entire proceeds of the investment as well as freedom from expropriation.

The Department of Environment and Natural Resources was the primary Government agency responsible for conservation, management, development, and proper use of the country's natural resources, including its minerals.

The minerals industry of the Philippines employed an estimated 400,000 people, or about 1.5% of the labor force, including an estimated 300,000 workers engaged in small-scale mining and panning activities, chiefly in artisanal gold workings. The metallic sector accounted for an estimated 75% of the industry's production value and nearly 100% of export earnings. Of the dozen or so major mining companies engaged in metal mining, six produced copper, gold, and silver from various operations; one of the six companies also produced refractory chrome ore; three additional companies operated mines for gold and silver; and three companies mined nickel ore. The industrial minerals sector was dominated by the production of limestone for cement manufacture, marble, and sand and gravel for construction uses.

Refined gold and copper continued to be the country's most

important mineral products, each representing more than 30% of total mineral value.

Japan remained the primary market for the country's mineral products in 1995. Almost all of the Philippine production of chromite and nickel and more than 60% of its copper concentrates were exported to Japan. The remaining copper concentrates were smelted by the Philippine Associated Smelting and Refining Corp. (PASAR) into copper cathodes at Isabel, Leyte Province, for export, again primarily to Japan.

The Philippines has had one of the oldest and most active mining industries of Southeast Asia, with a strong, established mining structure. The mining industry of the Philippines was dominated by a few large-scale private local companies mining chromite, copper, gold, nickel, and silver. Coal was mined by numerous private companies and three subsidiaries of the state-owned Philippine National Oil Co. (PNOC). One of the large Government-owned companies, the Semirara Coal Corp., produced about 65% of the country's coal. Copper, ferroalloys, and phosphate fertilizer were produced by three joint-venture firms. Cement was produced by private companies; most were Filipino owned, with only minor foreign interests.

Chromite ore production was centered in the Province of Zambales in northern Luzon where Benguet Corp. mined the world's largest single refractory chromite deposit, the Coto Mine, at its Masinloc operations.

Ferrochrome Philippines Inc. restarted production of ferrochromium in March at the rate of 3,500 metric tons per month following the return of sufficient rainfall to produce enough power to operate the plant. Ferrochrome Philippines was planning furnace and kiln renovations and repairs in 1996. Although Integrated Chrome Corp. and Philippine Minerals and Alloy Corp., formerly Ferro-Chemicals Inc., also resumed operations with the return of an adequate power supply, production was restricted during the year because of limited ore supplies.

The Canadian companies Echo Bay Mines Ltd. and TVI Pacific Inc. entered into an option in midyear to acquire Benguet's Kingking copper-gold prospect on Mindanao Island. Echo Bay and TVI were to form a new company, Kingking Mines Inc.; Echo Bay, as operator, was to acquire a 75% interest in the \$18.5 million project, with TVI holding the remaining 25%. Benguet, however, retained the option to buy a 20% interest in Kingking Mines should development of the project proceed.

In December, Atlas Consolidated Mining and Development Corp. entered into a 50-year lease agreement with Astron Resources Ltd., a Malaysian-based Australian company, for the reopening of Atlas' Carmen open pit-underground and Lutopan underground copper-gold mines in the Toledo District of central Cebu Island. The companies were to share equally the net proceeds from the operation. With Astron as manager of the newly formed Toledo Copper Corp., production was expected to be 32,000 metric tons per

day (t/d) within 9 months after startup and 42,000 t/d after 2 years, when the Lutopan Mine was expected to be reopened.

Lepanto Consolidated Mining Co. Inc. embarked late in the year on a program to develop additional copper-gold mineralization south of its Mankayan Mine in Benguet Province, Luzon Island. Production from this area was expected gradually to replace the remnant ores currently being mined.

Maricalum Mining Corp. was planning to rehabilitate its Sipalay copper mine on Negros Island in the central Philippines. The revitalization was expected to be completed during 1997. Maricalum had a marketing contract with Marubeni Corp. covering 90% of its copper concentrate production; the remaining 10% was sold to the country's only copper smelter at Isabel, Leyte Island, operated by PASAR.

Manila Mining Corp. increased its milling capacity to at least 8,000 t/d of ore at its placer gold mine on Mindanao with the installation of another semiautogenous grinding mill. The increase in milling capacity was to offset decreasing gold grades.

The tonnage milled at Benguet's Antamok gold operation in Benguet Province, Luzon Island, increased about 14% because of the rehabilitation project that was implemented during the year. However, the gold grade was 15% lower, and gold production for the year was 4% less than that of 1994.

The Philippines does not have a fully integrated steel sector, although several rod and bar mills and galvanizing plants have been established, all since the end of World War II.

Steelmaking in the Philippines involved scrap-based electric furnace steel melting operations, of which there were 17 facilities in 1995--13 in the National Capital Region; 3 in Pampanga Province to the northwest of Manila, the capital; and the Government-owned National Steel Corp.'s (NSC) steelworks at Iligan, Mindanao. NSC was the single largest steel company in the country, producing about one-third of total production.

The Philippine Sinter Corp., owned by Kawasaki Steel Corp. of Japan, imported iron ore fines from various overseas sources, primarily Australia, and exported iron ore sinter and pellets to Japan. The plant was opened in 1977 and has a capacity of 5 million metric tons per year (t/yr).

Manganese output was centered on the islands of Bohol, Busuanga, Marinduque, Masbate, and Siquijor, as well as in the Provinces of Zamboanga del Sur and Agusan del Norte on Mindanao. Many of the deposits, however, were small and unsuitable for large-scale mining operations.

The mainstay of Philippine nickel production continued to be Rio Tuba Nickel Mining Corp.'s Rio Tuba Mine in the far south of Palawan Island, Palawan Province. Hinatuan Mining Corp. and Taganito Mining Corp. both operated smaller mines in Surigao del Norte Province on Mindanao. All three worked lateritic nickel deposits, exporting all ore production to Japan.

Pacific Nickel Holdings, a consortium consisting of two London-based investors, Wheelock NatWest (a Hong Kong affiliate of the United Kingdom's National Westminster Bank) and Australia's Minproc Engineering, reportedly reached agreement near yearend with the Government's Asset Privatization Trust (APT) for the purchase of the nickel mines and refinery, previously operated by Philnico Mining and Industrial Corp., on Nonoc Island, Surigao del Norte Province. The purchase price of US\$333 million, US\$8 million higher than the figure originally agreed to because of the inclusion of an ammonia tank farm, included a 24-megawatt, on-site powerplant, extensive lateritic ore reserves containing nickel and cobalt, and the 35,000-metric-ton-per-year capacity refinery near Surigao City. The cost of rehabilitating the refinery was estimated to be US\$187.5 million. The negotiated agreement required seeking by Pacific Nickel settlement of ownership claims with Philnico's previous owner, a renowned Filipino business executive. Philnico finally ceased mining on Nonoc Island in March 1986, and the APT foreclosed on the properties because of low metal prices. The refinery previously was seized and mothballed in 1984 by the APT for unpaid debt owed to a state-owned bank.

Because of the extensive rehabilitation required following a decade of disuse, production probably would not begin for 2 to 3 years after the decision was made to proceed with renovation and development. Approximately 3,000 employees, about the same number of people employed in Philnico's operations before closure, were considered necessary to resume the operation. The Nonoc nickel mining-refining complex was the largest of all assets, including nonmining ones, to have been sold by the APT.

Coal in the Philippines generally is classified as lignite or subbituminous and is of poor quality for use in power generation. Thus, higher grade imported coal was blended with indigenous coals to improve its burning characteristics. Recently, the Philippines has imported about 900,000 t/yr of coal from Indonesia; 800,000 t/yr from Australia; and 400,000 t/yr from China. With domestic consumption of coals steadily increasing, the Government lowered in July the tariff rate to 20% on imported coals for a 3-year period. After the 3-year period, the tariff rate was to be reduced to 10% until 2004, when the final 5% rate was to take effect.

The Philippines has produced only about 2% of its crude petroleum requirements domestically, with about 95% of production coming from the West Linapacan Field in the Palawan Basin off the northwest coast of Palawan Island. Remaining domestic production was from the reopening of the Matinloc Field and the older Nido Field, both also in the Palawan Basin in the South China Sea.

The country's only gas producer was the onshore San Antonio Field on Luzon Island operated by the PNOC.

Major Sources of Information

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Major Publications

Central Bank of the Philippines, Manila: Statistical Bulletin and Annual Report.

Chamber of Mines of the Philippines, Manila: Newsletter and Annual Report.

Mines and Geosciences Bureau, Manila: Mineral News Service and Annual Report.

TABLE 1
PHILIPPINES: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

| Commodity 2/ | 1991 | 1992 | 1993 | 1994 | 1995 e/ |
|---|-----------|------------|------------|---------------|------------|
| METALS | | | | | |
| Arsenic: White (equivalent of arsenic acid) e/ | 5,000 | 5,000 | 2,000 | 2,000 | 2,000 |
| Chromium: Chromite, gross weight: | | | | | |
| Metallurgical-grade | 89,208 | 30,925 r/ | 7,272 r/ | 10,881 r/ | 20,000 |
| Chemical-grade | 19,756 | 9,988 | 1,600 | -- | -- |
| Refractory-grade | 82,520 | 39,596 r/ | 49,564 | 64,075 r/ | 75,000 |
| Total | 191,484 | 80,509 r/ | 58,436 r/ | 74,956 r/ | 95,000 |
| Copper: | | | | | |
| Mine output, Cu content | 148,347 | 123,523 | 136,257 | 112,075 r/ | 105,655 3/ |
| Metal: | | | | | |
| Smelter | 167,462 | 168,831 | 212,446 r/ | 200,300 r/ | 198,000 3/ |
| Refined | 115,471 | 112,460 r/ | 165,954 r/ | 154,713 r/ | 192,400 3/ |
| Gold, mine output, Au content kilograms | 25,916 | 25,609 r/ | 21,155 r/ | 27,059 r/ | 27,144 3/ |
| Iron and steel: | | | | | |
| Ferroalloys, electric-furnace: | | | | | |
| Ferrochromium | 23,700 r/ | 27,400 | 11,908 | 16,186 | 50,450 3/ |
| Ferromanganese e/ | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 |
| Ferro silicon e/ | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 |
| Steel, crude thousand tons | 605 | 497 | 623 | 473 r/ | 500 |
| Lead: Metal, secondary refined | 16,100 | 19,100 | 24,300 | 17,200 r/ | 17,200 |
| Manganese ore and concentrate, gross weight | 4,064 | 13,798 r/ | 12,418 | 10,000 e/ | 10,000 |
| Nickel, mine output, Ni content | 13,658 | 13,000 r/ | 7,663 r/ | 9,895 r/ | 15,075 3/ |
| Silver, mine output, Ag content kilograms | 38,414 | 32,785 r/ | 28,043 r/ | 29,562 r/ | 26,870 3/ |
| INDUSTRIAL MINERALS | | | | | |
| Barite e/ | 500 | 500 | 500 | 500 | 500 |
| Cement, hydraulic thousand tons | 6,913 | 6,667 r/ | 7,962 | 9,600 r/ | 9,800 |
| Clays: | | | | | |
| Bentonite | 42,066 | 7,428 r/ | 5,050 | 25,000 e/ | 20,000 |
| Red | 552 | 500 e/ | 791 | 800 e/ | 800 |
| White | 51,528 | 45,000 e/ | 5,557 | 50,000 e/ | 50,000 |
| Other | 808,133 | 742,074 | 700,000 e/ | 800,000 e/ | 800,000 |
| Feldspar | 47,979 | 48,400 r/ | 44,600 r/ | 30,000 e/ | 30,000 |
| Gypsum and anhydrite, natural | 28,000 | 25,000 | 25,000 e/ | 25,000 e/ | 25,000 |
| Lime e/ | 7,458 3/ | 10,000 | 10,000 | 10,000 | 10,000 |
| Magnesite e/ | 700 | 700 | 700 | 700 | 700 |
| Perlite | 2,894 | 2,800 e/ | 19,779 | 20,000 e/ | 20,000 |
| Phosphate: | | | | | |
| Guano | 11,689 | 326 r/ | 859 r/ | 5,000 e/ | 5,000 |
| Phosphate rock | 20,633 | 4,834 | 91,779 | 20,000 e/ | 20,000 |
| Pyrite and pyrrhotite (including cuprous), gross weight | 359,607 | 350,000 e/ | 316,980 | 320,000 e/ | 320,000 |
| Salt, marine | 492,859 | 495,816 | 535,481 | 540,000 r/ e/ | 540,000 |
| Sand and gravel: | | | | | |
| Silica sand thousand tons | 532 | 744 r/ | 828 | 800 e/ | 800 |
| Other 4/ thousand cubic meters | 15,677 | 15,787 | 15,913 r/ | 15,000 e/ | 15,000 |
| Stone: | | | | | |
| Dolomite | 608,779 | 470,293 r/ | 108,150 r/ | 675,000 e/ | 675,000 |
| Limestone 5/ thousand tons | 5,384 | 5,092 | 5,190 | 5,000 e/ | 5,000 |
| Marble (dimension), unfinished cubic meters | 24,178 | 263,799 r/ | 359,394 | 300,000 e/ | 300,000 |
| Volcanic cinder e/ do. | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 |
| Tuff | 51,756 | 50,000 e/ | 3,264 | 50,000 e/ | 50,000 |
| Quartz e/ | 60,000 | 50,000 | 50,000 | 50,000 | 50,000 |
| Crushed, broken, other e/ 6/ thousand cubic meters | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 |
| Sulfur: e/ | | | | | |
| S content of pyrite | 155,000 | 64,000 | 114,000 | 100,000 | 100,000 |
| Byproduct of metallurgy | 119,000 | 111,000 | 147,000 | 125,000 | 125,000 |
| MINERAL FUELS AND RELATED MATERIALS | | | | | |
| Coal, all grades thousand tons | 1,267 | 1,655 r/ | 1,531 | 1,300 r/ e/ | 1,320 3/ |
| Petroleum: | | | | | |
| Crude thousand 42-gallon barrels | 1,091 | 2,945 | 3,321 | 1,825 r/ | 1,205 3/ |
| Refinery products: | | | | | |
| Liquefied petroleum gas do. | 2,777 | 2,914 | 2,607 | 2,806 | 2,800 |
| Gasoline do. | 15,321 | 13,378 | 13,052 | 12,168 | 12,200 |
| Jet fuel do. | 3,400 e/ | 4,067 | 3,058 | 4,352 | 4,350 |

See footnotes at end of table.

TABLE 1--Continued
PHILIPPINES: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

| Commodity 2/ | 1991 | 1992 | 1993 | 1994 | 1995 e/ |
|--|-----------|--------|--------|--------|---------|
| MINERAL FUELS AND RELATED MATERIALS--Cont'd. | | | | | |
| Petroleum: Refinery products--Continued: | | | | | |
| Kerosene do. | 3,299 | 4,280 | 4,270 | 3,916 | 3,900 |
| Distillate fuel oil do. | 24,157 | 26,733 | 25,213 | 26,338 | 26,300 |
| Residual fuel oil do. | 24,131 | 27,474 | 28,431 | 29,582 | 29,600 |
| Other do. | 5,500 e/ | 3,922 | 5,886 | 5,230 | 5,250 |
| Refinery fuel and losses do. | 2,839 | 3,300 | 3,300 | 3,262 | 3,250 |
| Total do. | 81,424 e/ | 86,068 | 85,817 | 87,654 | 87,650 |

e/ Estimated. r/ Revised.

1/ Table includes data through May 28, 1996.

2/ In addition to the commodities listed, the Philippines produces platinum-group metals as byproducts of other metals, but output is not reported quantitatively, and no basis is available to make reliable estimates.

3/ Reported figure.

4/ Includes "pebbles" and "soil" not further described.

5/ Excludes limestone for road construction.

6/ Includes materials described as rock, crushed or broken; stones, cobbles, and boulders; rock aggregates; and broken adobe.

TABLE 2
PHILIPPINES: STRUCTURE OF THE MINERAL INDUSTRY FOR 1995

(Thousand metric tons unless otherwise specified)

| Commodity | Major operating companies and major equity owners | Location of main facilities | Annual capacity e/ |
|------------------------|--|---|--------------------|
| Cement | Alsons Cement Corp., 100% | Lugait plant, Mindanao Island | 624 |
| Do. | Bacnotan Consolidated Industries Inc., 100% | Bacnotan Plant, Luzon Island | 1,200 |
| Do. | Davao Union Cement Corp., 100% | Davao City plant, Mindanao Island | 648 |
| Do. | Iligan Cement Corp., 100% | Iligan City plant, Mindanao Island | 634 |
| Do. | Northern Cement Co. Inc., 100% | Sison plant, Luzon Island | 640 |
| Do. | Republic Cement Corp., 100% | Norzagaray plant, Luzon Island | 950 |
| Do. | Rizal Cement Co. Inc., 100% | Binangonan plant, Luzon Island | 964 |
| Chromite: | | | |
| Concentrate | Acoje Mining Co. Inc., operator. (Voest Alpine AG of Austria, 75.6%; and Merlin Mining NL of Australia, 24.4%) | Santa Cruz Mine, Zambales Province, Luzon Island | 100 1/ |
| Do. | Alamag Processing Corp., operator. (Pacific Shore Mining Co., 50%; and Rio Chico Mining Corp., 50%) | Llorente, Eastern Samar Province, Samar Island | 20 2/ |
| Do. | Benguet Corp., 70%, operator; and Consolidated Mines Inc., 30% | Masinloc Chromite Operations, Zambales Province, Luzon Island | 105 3/ |
| Ferrochromium | Ferrochrome Philippines Inc., operator. (Voest Alpine AG of Austria, 100%) | Tagoloan plant, Misamis Oriental Province, Mindanao Island | 60 |
| Do. | Philippine Minerals and Alloy Corp., 100% | Manticao plant, Misamis Oriental Province, Mindanao Island | 10 |
| Do. | Integrated Chrome Corp., 100% | do. | 28 |
| Coal | Semirara Coal Corp. (Government), manager. Voest Alpine AG of Austria, 60%; National Development Corp., 36%; and Development Bank of the Philippines, 4%) | Unong Mine, Antique Province, Semirara Island | 1,000 |
| Copper, ore | Atlas Consolidated Mining and Development Corp., 100% | Cebu Copper Operations, Cebu Province, Cebu Island | 24,250 |
| Do. | Benguet Corp., 50%, operator; and Dizon Copper-Silver Mines Inc., 50% | Dizon Copper-Gold Operation, Zambales Province, Luzon Island | 6,000 |
| Do. | Far Southeast Resources Inc., manager. (Lepanto Consolidated Mining Co. Inc., 60%; and CRA Ltd. of Australia, 40%) | Far South East Project, Benguet Province, Luzon Island | 4,000 4/ |
| Do. | Lepanto Consolidated Mining Co. Inc., 100% | Mankayan Mine, Benguet Province, Luzon Island | 1,100 |
| Do. | Marcopper Mining Corp., operator. Provident Tree Farms, 60%, and Placer Dome Inc. of Canada, 40% | Marcopper Mine, Marinduque Province, Marinduque Island | 30,000 |
| Do. | Maricalum Mining Corp., manager. [Asset Privatization Trust (Government), 100%] | Sipalay Mine, Negros Occidental Province, Negros Island | 6,250 |
| Do. | Philex Mining Corp., 100% | Sto. Tomas II (Padcal) Mine, Benguet Province, Luzon Island | 10,200 |
| Copper, metal, refined | Philippine Associated Smelting and Refining Corp., operator. [National Development Corp. (Government), 42%; Japanese consortium of companies led by Marubeni Corp., 32%; domestic copper producers led by Atlas Consolidated Mining and Development Corp., 21%; and International Finance Corp. (United Nations Agency), 5%] | Isabel, Leyte Province, Leyte Island | 172 |

See footnotes at end of table.

TABLE 2--Continued
 PHILIPPINES: STRUCTURE OF THE MINERAL INDUSTRY FOR 1995

(Thousand metric tons unless otherwise specified)

| Commodity | | Major operating companies and major equity owners | Location of main facilities | Annual capacity e/ |
|------------------|------------------------------------|--|--|--------------------|
| Gold | kilograms | Atlas Consolidated Mining and Development Corp., 100% | Masbate Gold Operations, Masbate Province, Masbate Island | 2,500 5/ |
| Do. | do. | Benguet Corp., 100% | Benguet Gold Operations, Benguet Province, Luzon Island | 1,100 5/ |
| Do. | do. | do. | Benguet Antamok Gold Operation, Benguet Province, Luzon Island | 3,000 |
| Do. | do. | Philex Mining Corp., 100% | Bulawan Mine, Negros Occidental Province, Negros Island | 2,800 4/ |
| Do. | do. | United Paragon Mining Corp., operator. (Paragon Resources of Australia, 12.5%; and public shares, 87.5%) | Longos Mine, Camarines Norte Province, Luzon Island | 1,800 |
| Iron ore, sinter | | Philippine Sinter Corp., operator. (Kawasaki Steel Corp. of Japan, 100%) | Cagayan de Oro, Misamis Oriental Province, Mindanao Island | 5,000 6/ |
| Nickel, ore | | Rio Tuba Nickel Mining Corp., 60%; and Japanese interests, 40% | Rio Tuba Mine, Palawan Province, Palawan Island | 500 |
| Do. | | Taganito Mining Corp., 100% | Taganito Mine, Palawan Province, Palawan Island | 100 |
| Petroleum | thousand 42-gallon barrels per day | Caltex (Philippines) Inc., 100% | Caltex Batangas Refinery, Batangas Province, Luzon Island | 68 |
| Do. | do. | Petron Corp., operator. [Philippine National Oil Co. (Government), 100% | Petron Bataan Refinery, Bataan Province, Luzon Island | 156 |
| Do. | thousand 42-gallon barrels per day | Pilipinas Shell Petroleum Corp., 100% | Shell Batangas Refinery, Batangas Province, Luzon Island | 70 |
| Steel | | National Steel Corp., operator. [National Development Corp. (Government), 100%] | Iligan, Lanao del Norte Province, Mindanao Island | 350 |

e/ Estimated.

1/ Metallurgical-grade concentrates.

2/ Chemical-grade concentrates.

3/ Refractory-grade concentrates.

4/ In planning stage during year.

5/ On care and maintenance during year.

6/ Self-fluxing sinter.