



2005 Minerals Yearbook

LEAD

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Domestic lead mine production decreased slightly compared with that of 2004. Alaska and Missouri were the dominant producing States with a 93% share. Other appreciable lead mine production was in Idaho, Montana, and Washington. Lead was produced at 10 U.S. mines employing about 860 people. The value of domestic mine production was more than \$574 million. Lead concentrates produced at the Missouri mines were processed into primary metal at the only remaining domestic smelter-refinery, also located in Missouri.

Secondary lead, derived principally from scrapped lead-acid batteries, accounted for 89% of refined lead production in the United States.

Lead was consumed in about 110 U.S. plants to manufacture end-use products, including ammunition; building-construction materials; covering for power and communication cable; lead oxides in ceramics, chemicals, glass, and pigments; solders for construction, electrical/electronic components and accessories, metal containers, and motor vehicles; storage batteries; added in small amounts to some machining steel and aluminum; and used molten to cool and anneal some specialty steels.

Lead-acid batteries, including starting-lighting-ignition (SLI) and industrial types, continued to be the dominant use of lead, accounting for 88% of reported lead consumption. Shipments of replacement batteries in North America totaled 95.7 million units in 2005, a 1.5% increase from those of 2004. Shipments of automotive batteries were 21.4 million units in 2005 or 3.9% less than in 2004 (Platts Metals Week, 2006).

Monthly sales of lead from the National Defense Stockpile (NDS) totaled 29,500 metric tons (t) (32,500 short tons) in 2005, leaving 19,500 t (21,500 short tons) in uncommitted inventory in the NDS at yearend.

Lead prices increased during the year to an average of \$0.443 per pound on the London Metal Exchange (LME) and \$0.6103 per pound for the North American Producer price.

Legislation and Government Programs

Monthly sales of lead from the NDS continued during 2005 under the basic ordering agreement (BOA) DLA-Lead-005. The Defense National Stockpile Center's (DNSC) annual materials plan (AMP) approved by the U.S. Congress for fiscal years 2005 and 2006—the fiscal year runs from October 1 to September 30—included a maximum sales authority for lead of 54,400 t (60,000 short tons) for each fiscal year. For fiscal year 2006, the quantity to be sold will be limited to the remaining inventory, which is less than 54,400 t (Defense National Stockpile Center, 2004, 2005). BOA sales from the NDS during calendar year 2005 totaled 29,500 t. On December 31, 2005, a little more than 19,500 t (21,500 short tons) of uncommitted lead inventory remained in the NDS, down from 41,600 t (45,900 short tons) on December 31, 2004.

Production

Primary.—In 2005, domestic mine production of recoverable lead was 426,000 t, a decrease of 4,000 t compared with that of 2004. The major share of the U.S. mine output of lead continued to be derived from production in Alaska and Missouri. Lead mine production also was reported in Idaho, Montana, and Washington. Domestic mine production data were collected by the U.S. Geological Survey (USGS) from a precious-metal and base-metal voluntary survey on lode-mine production. All lead-producing mines responded to the survey. The lead concentrates produced from the mined ore were processed into primary metal at one domestic smelter-refinery in Missouri (tables 1-4).

Doe Run Resources Corp., St. Louis, MO, produced primary lead at one smelter-refinery facility in Missouri—the Herculaneum smelter. Concentrates for the smelter-refinery were provided mainly from the Doe Run mills—Brushy Creek, Buick, Fletcher, and Sweetwater. During 2005, these mills were supplied ore from production shafts—Brushy Creek, Buick, Fletcher, Sweetwater, Viburnum #29, and Viburnum #35 mine shafts—located along the mineralized Viburnum Trend in southeastern Missouri. In 2005, Doe Run's U.S. operations shipped 294,000 t of refined lead metal and lead alloy products, including lead recycled for customers (tolling). In addition, the U.S. operations shipped 138,000 t of lead concentrates to international metal trading companies in 2005. As of October 31, 2005, Doe Run's proven and probable ore reserves in the United States reportedly were 34 Mt, containing an estimated 2.14 Mt of lead, 0.47 Mt of zinc, and 0.09 Mt of copper. A major development project was started at the southern end of Doe Run's Fletcher Mine to access an ore body known as RC Westfork. This development project was expected to be completed in 2006 (Doe Run Resources Corporation, 2006§¹).

Teck Cominco Alaska Inc. (a wholly owned subsidiary of Teck Cominco Limited, Vancouver, British Columbia, Canada) operated the Red Dog zinc-lead Mine in northwestern Alaska under a leasing agreement with NANA Regional Corp., the sole owner of the property. NANA is a corporation organized under the provisions of the Alaska Native Claims Settlement Act. During 2005, production of lead in concentrate at Red Dog decreased by 13.5% to 102,000 t compared with 117,900 t in 2004. The average mill recovery of lead at Red Dog was 59.0% in 2005 compared with 65.9% in 2004. Proven ore reserves at Red Dog, as of December 31, 2005, reportedly were estimated to be 19.5 Mt grading 20.5% zinc and 5.7% lead (Teck Cominco Limited, 2006§).

Teck Cominco's Pend Oreille zinc-lead mine near Metaline Falls, WA, produced 8,000 t of lead in concentrates in 2005.

¹References that include a section mark (§) are found in the Internet References Cited section.

Proven and probable ore reserves at Pend Oreille, as of December 31, 2005, reportedly were estimated to be 4.3 Mt grading 7.1% zinc and 1.3% lead; an additional, more speculative 3.3-Mt resource has been inferred at the property grading 6.6% zinc and 1.3% lead (Teck Cominco Limited, 2006§).

Hecla Mining Company, Coeur d'Alene, ID, operated the Lucky Friday Mine in Mullan, ID, throughout 2005. Lucky Friday is an underground silver-lead mine 100% owned by Hecla that has been producing since 1958. Concentrates at Lucky Friday were produced in a 1,100-metric-ton-per-day (t/d) conventional flotation mill. In 2005, ore was processed at a rate of 587 t/d, and production increased by 20% compared with that of 2004 to a level of 14,600 t of lead contained in concentrates. All silver, lead, and zinc concentrate production from the Lucky Friday operation was shipped to Teck Cominco's smelter in Trail, British Columbia, Canada, in 2005. Additional drilling of the 5900 level nearly doubled the mine's proven and probable ore reserves of lead, silver, and zinc, which were estimated to be 1.29 Mt grading 459 grams per metric ton (g/t) (reported as 13.4 troy ounces per short ton) silver, 7.7% lead, and 2.9% zinc at yearend 2005 (Hecla Mining Company, 2006§).

Hecla Mining also held a 29.7% interest in the Greens Creek Mine on Admiralty Island near Juneau, AK, through a joint-venture arrangement with Kennecott Greens Creek Mining Co. (the manager of the mine) and Kennecott Juneau Mining Company (wholly owned subsidiaries of Kennecott Minerals Company). The Greens Creek unit is a polymetallic, stratiform, massive sulfide deposit lying within the Admiralty Island Monument area and includes 17 patented lode claims and 1 patented millsite claim. In addition, it includes property leased from the U.S. Department of Agriculture's Forest Service and has title to mineral rights on 3,035 hectares of Federal land adjacent to the mine properties.

In 2005, 2,000 t/d of ore was mined (underground) and milled onsite at Greens Creek to yield lead, zinc, and bulk concentrates as well as a gold-silver dore. Total production of lead in concentrate was 21,900 t in 2005 compared with 24,800 t in 2004. Proven and probable reserves at the Greens Creek Mine at yearend 2005 reportedly were estimated to be 7.5 Mt grading 497 g/t (reported as 14.5 ounces per short ton) silver, 4.11 g/t (reported as 0.12 ounces per short ton) gold, 10.2% zinc, and 3.9% lead (Hecla Mining Company, 2006§).

Continued progress was made on identifying an underground ore body across the Gallagher Fault at the Greens Creek Mine. In addition to extensive drilling, an exploration drift was driven into the West Gallagher Zone to establish drilling platforms to define the deposit further, which already has in excess of 93 exploration holes drilled into it. In 2006, the primary exploration focus at Greens Creek will continue to be the West Gallagher Zone. In addition, significant surface reconnaissance on the rest of the property took place in 2005, and several drill targets were identified (Hecla Mining Company, 2006§).

The Greens Creek unit was powered by diesel generators located onsite. However, an agreement was reached during 2005 to purchase excess hydroelectric power from the local power company, and installation of the necessary infrastructure is expected to be complete during the first half of 2006. As a result, hydroelectric power will replace 23% to 35% of the

diesel-generated power through 2008. Construction of a new hydroelectric plant by the local power company is anticipated by 2009, at which time it is estimated that it will have the capacity to supply 95% of Greens Creek power (Hecla Mining Company, 2006§).

In 2005, Apollo Gold Corp.'s Montana Tunnels open pit mine near Helena, MT, produced 1,390 kilograms (kg) (44,700 troy ounces) of gold, 16,900 kg (545,000 ounces) of silver, 4,730 t of lead, and 10,200 t of zinc. Mining was suspended in mid-October as a result of pit wall instability. Ongoing slope deformations resulted in too steep a slope between the ramps and weakening of the rock mass, which created localized instabilities along the haul ramp that reduced ramp width and increased the frequency of rock falls. On October 22, the company decided that for safety reasons, mining would stop, and Apollo Gold hired a third party consultant to review mine design criteria and determine scenarios under which mining could safely resume. During the suspension of mining, the mill produced gold dore and lead-gold and zinc-gold concentrate from low-grade ore stockpiles. After the evaluation was completed, a mine redesign was estimated to cost \$12 million, and the company adopted a plan to dispose of the Montana Tunnels Mine in March 2006 (Apollo Gold Corp., 2006§).

Secondary.—Domestic secondary lead production increased by 2% in 2005, increasing to 1.14 Mt. Secondary lead accounted for 89% of domestic lead refinery production compared with 88% in 2004. Lead-acid batteries continued to be the dominant source of recoverable lead scrap, accounting for 92% of all lead produced from secondary sources. The domestic secondary statistics were derived by the USGS from a combined secondary producer and consumer survey that included data from monthly and annual surveys. Fourteen companies producing secondary lead, exclusive of that produced from copper-base scrap, were surveyed; 13 responded, representing more than 99% of the total production of secondary lead. Almost all the lead recycled in 2005 was produced by 13 companies operating 18 plants in California, Florida, Illinois, Indiana, Louisiana, Minnesota, Missouri, New York, Ohio, Pennsylvania, and Texas. Production and consumption for the nonrespondent were estimated by using prior-year levels as a basis (tables 1, 5-9).

From 1992 to 2005, U.S. lead production from scrap has increased from 916,000 t to 1,140,000 t, a 24% increase. Scrap lead exported in 2005 was 67,300 t.

In July, Johnson Controls, Incorporated (JCI) purchased Delphi Corporation's global lead-acid battery business for \$202.5 million. Excluded from the announced deal were Delphi's two U.S. manufacturing facilities, which would continue to supply batteries to General Motors Corp. through a contract with Johnson Controls. Subject to agreement between Delphi and its unions, it was anticipated that JCI would purchase Delphi's New Brunswick, NJ, operation. Pending a commercial agreement between Delphi and a customer and final discussions with the United Auto Workers Union, the Fitzgerald, GA, operation would remain with Delphi and change to a new product line at the conclusion of this transition period (Delphi Corporation, 2005§). Delphi filed for Chapter 11 bankruptcy protection in October.

The American Stock Exchange approved the stock listing of Metalico, Incorporated. Metalico, founded in 1997, has plants in

six States fabricating lead products and recycling nonferrous and ferrous metals. Its Mayco Industries Inc., plant in Birmingham, AL, was the Nation's leading producer of nonbattery lead products (Platts Metals Week, 2005c).

Consumption

Reported U.S. consumption of lead decreased slightly in 2005. Consumption of lead in lead-acid batteries and ammunition remained essentially unchanged in 2005. Consumption in bearing metals, brass and bronze, ceramics, chemicals, paints, pigments and miscellaneous uses decreased, whereas lead consumption in sheet metal for building construction, solder, and casting metals increased. Contributing to some of the declining lead consumption categories in the United States was the relocation of some lead-consuming industries to other areas of the world.

Consumption of lead in SLI- and industrial-type lead-acid storage batteries represented 88% of the total reported consumption of lead. Industrial-type batteries included stationary batteries (such as those used in uninterruptible power-supply equipment for computer and telecommunications networks, hospitals, and load-leveling equipment for commercial electrical power systems) as well as traction batteries (such as those used in airline ground equipment, industrial forklifts, and mining vehicles) (tables 6-13).

Trade

In 2005, lead metal imports were 298,000 t, a 51% increase from those of 2004. Exports of metal declined 22% to 64,800 t.

In 2005, the United States exported 42,800 t of lead metal and 6,650 t of contained lead in mine concentrates to Mexico, and imported 17,200 t of lead metal. U.S. net exports of lead metal to Mexico were 25,600 t. In 2005, however, the U.S. also imported 14.4 million lead-acid batteries of all sizes from Mexico, 96% of which was for cars and light trucks.

Prices

LME lead prices sustained increases that began in the second half of 2003. LME monthly average prices started 2005 at \$952 per metric ton, increasing to \$1,005 per ton in March. The price fluctuated for the next few months and reached a low for the year of \$854 per ton in July. The monthly average price increased steadily the remainder of the year and reached \$1,124 per ton in December. These sustained price increases were attributed to the continued strength of the Chinese economy and a third year of refined lead world supply deficit. The average LME and North American Producer prices increased in 2005 to \$0.442 per pound and \$0.610 per pound, respectively, from the average prices of \$0.402 per pound and \$0.5514 per pound, respectively, in 2004 (table 1).

World Industry Structure

World mine production of lead increased by 160,000 t to 3.27 Mt in 2005, or a 5% increase compared with production in

2004. Of the 38 countries in which lead was mined, 6 accounted for 82% of the world's total production. China was the leading producer, with 30% of the world total, followed by Australia, 23%; the United States, 13%; Peru, 10%; Mexico, 4%; and Canada, 2%. Production increased in 2005 in all the leading producer countries except the United States (table 14).

Worldwide reserves of lead contained in demonstrated resources in producing and nonproducing deposits at yearend were estimated to be 67 Mt by the USGS (Gabby, 2006). Reserves for the three leading producers in the world, Australia, China, and the United States, were 15 Mt, 11 Mt, and 8.1 Mt of contained lead, respectively. The reserve base (reserves plus measured and indicated resources that are marginally economic and some of those that are currently subeconomic) for Australia and China was 28 Mt and 36 Mt, respectively. The reserve base for the United States was 20 Mt. The total world reserve base at the end of 2005 was estimated to be 140 Mt.

World production of refined lead increased to 7.47 Mt in 2005 from 6.95 Mt in 2004. Other statistics for 2005, as reported by the International Lead and Zinc Study Group, were as follows: world consumption increased to 7.74 Mt from 7.28 Mt in 2004; commercial stocks of refined lead in industrialized countries were 313,000 t, or 2 weeks of consumption, at yearend 2005 compared with 299,000 t at yearend 2004 and 407,000 t at yearend 2003 (International Lead and Zinc Study Group, 2006, p. 6-21).

The structure of the lead mining and refining industries was affected by a number of changes, including the opening and development of new facilities as well as the closing, reopening, expanding, selling, restructuring, and modernizing of existing facilities.

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Australia.—In October, a large stope that was to provide production for more than 3 months at CBH Ltd.'s Endeavor Mine in New South Wales suffered a sidewall and roof failure and was lost from the production schedule. In the process, the paste backfill underground delivery system was damaged, which resulted in a 6-month delay in supply of cemented backfill for mine voids; the majority of planned production for the second half of the 2005-06 fiscal year was dependent on backfilling of voids. A restructuring of the mine began in November (CBH Ltd., 2006§).

In September, Ivernia, Inc. (Toronto, Ontario, Canada) officially opened its Magellan Mine in Western Australia. In April, Ivernia had acquired full ownership of the mine by purchasing its partner's 49% interest in the property. In 2005, 50,000 t of lead concentrates was produced at the mine. At full capacity, the mine was expected to produce 100,000 metric tons per year (t/yr) of lead in concentrates. Installation of a secondary ball mill and a second concentrate thickener were planned for 2006 to improve capacity at the mine. Installation of the second concentrate thickener was scheduled to be completed in the first quarter of 2006, and installation of secondary ball mill was scheduled for June. As of December 31, 2005, measured and indicated reserves at the Magellan deposit reportedly were estimated to be 13.9 Mt at a grade of 6.0% lead (Ivernia, Inc., 2006§).

In April, Malaysian lead alloy producer Metal Reclamation (Industries) Sdn Bhd entered into a contract with Magellan Metals to purchase 60,000 t of lead in concentrate in 2005 and 100,000 t in 2006. The company would use the concentrate to replace used lead-acid batteries as feed for Metal Reclamation's 40,000-t/yr lead smelter in Pulau Indah (Platts Metals Week, 2005f).

In August, Xstrata plc announced its intention to convert the McArthur River zinc-lead mine in the Northern Territory from an underground to an open pit operation. The open pit conversion would increase ore throughput to 1.8 Mt/yr from 1.6 Mt/yr in order to maintain current levels of concentrate production from declining ore grades and would extend the mine's life by at least 25 years (Xstrata plc, 2005). Also in August, Xstrata filed an environmental impact statement (EIS) with the Northern Territory government and, in December, submitted a supplementary EIS in response to submissions received as part of the consultation process. In February 2006, the Northern Territory Minister for the Environment and Heritage declined to recommend the approval of Xstrata's proposal; a final decision was expected in April. McArthur River Mine's current Mine Management Plan, which has been approved by the Northern Territory government's Department of Business, Industry and Resource Development, included approval for a test pit onsite to contribute ore for sampling and for processing. Approval also was received to deepen the test pit to provide additional ore in the near term (Xstrata plc, 2006§). In September, ANT Minerals Pty. Ltd. [a joint venture between Nippon Mining Holdings (60%), Mitsui & Co. (20%), and Marubeni Corp. (20%)] announced that it would sell its 25% stake in the McArthur River Mine to Xstrata, which owned 75% of the mine. The deal, which was completed in December, gave Xstrata sole ownership of the mine (Platts Metals Week, 2005g).

Operations at Xstrata's Mount Isa Lead Mine ceased on December 31, 2005, because of depletion of reserves, after operating for more than 80 years. The company's new Black Star lead-zinc mine, which was commissioned in February, produced a total of 1.4 Mt of ore during 2005 (Xstrata plc, 2006§).

Intec Ltd. began operating a 4-t/d pilot plant at the Hellyer Metals project, which officially opened in September in Burnie, Tasmania. Of the metals contained in tailings, 75% was extracted in the demonstration plant, with recoveries of 97% of the contained lead and 96% of the contained zinc in addition to high recovery levels for copper and silver. The zinc was electrowon in cathodes, and the lead was recovered in the form of a lead-silver cement. A bankable feasibility study for the project was scheduled to be completed in March 2006 (Intec Ltd., 2005§).

In February, Zinifex Australia Ltd. declared a force majeure on concentrate shipments from its open pit Century Mine in northwest Queensland. An electrical fault at the semiautogeneous grinding mill forced closure of the concentration circuit. A production loss of 17,700 t of zinc in concentrate and 1,400 t of lead in concentrate took place during the 11½ day shutdown (Platts Metals Week, 2005l).

In May, Terramin Australia Ltd. announced that it had concluded a joint-partnership agreement with Zinifex, whereby Zinifex would invest up to \$6 million in the Mennennie Dam project for exploration and development and earn up to a 70% share in the joint venture. The project encompasses the largest known lead-zinc

and silver deposit in South Australia with almost equal proportions of lead and zinc (Terramin Australia Ltd., 2005).

Canada.—After a 2½ month strike that began in July, Teck Cominco and the unions at the company's Trail, British Columbia, operations, United Steelworkers Locals 480 and 9705, ratified the terms of a new collective agreement in October. The collective agreement, applicable to 1,235 unionized employees, was for a 3-year term from June 1, 2005, to May 31, 2008. The agreement provided for wage increases of 10%, a 12% improvement in the basic pension, enhancements to a number of benefits, and a \$3,500 cash payment. As a result of the strike, refined lead production at the smelter was 69,000 t, about 19% less than that in 2004 (Teck Cominco Limited, 2005§).

China.—Preliminary Chinese refined lead metal production for 2005 was 2.39 Mt, an increase of 24% compared with that of 2004. U.S. Census Bureau data indicated that companies in the United States shipped 115,000 t of lead contained in concentrates to China (11% of China's total concentrate imports). Imports of lead and concentrates increased to 1.03 Mt in 2005 from 831,000 t in 2004 (United Nations Statistics Division, 2006§).

In December, Shenzhen Zhongjin Lingnan Nonfemet Co. Ltd., China's third leading zinc producer, was forced to close its Shaoguan smelter in Guangdong Province following a toxic spill into the Beijing River. The smelter had the capacity to produce 160,000 to 170,000 t/yr of zinc. After renovating the waste treatment systems and passing an inspection for compliance with government environmental standards, the smelter reopened in February 2006 (Beijing Antaika Information Development Co. Ltd., 2006b; Metal-Pages, 2006§).

Yuguang Gold & Lead Co. Ltd. in Henan Province completed a 60,000-t/yr refined lead upgrade and increased capacity to 310,000 t/yr. Yuguang planned to complete a 60,000-t/yr expansion at its lead recycling facilities by November 2006, which would bring the company's total lead recycling capacity to 100,000 t/yr of crude lead (Platts Metals Week, 2005k).

Production began in December at Guangxi South Nonferrous Metal Smelting's electrolytic plant in Nandan County, Guangxi Province. The smelter has the capacity to produce 80,000 t/yr of zinc and 80,000 t/yr of lead in addition to antimony, silver, and sulphuric acid. The company planned to export at least 90% of these products to Japan, the Republic of Korea, Taiwan, and the United States. Also in December, production began at Yunnan Metallurgical's nonferrous metal production facility in the Quijing Economic and Technology Development Zone, Yunnan Province. The plant had the capacity to mine and concentrate 2,000 t/d of lead and zinc ores combined, yielding 100,000 t/yr of refined lead and 100,000 t/yr of refined zinc by an electrolytic process (CRU Monitor, 2006).

In November, Panlong Lead and Zinc Mining Corp. commissioned its lead-zinc mine in China. The project has the capacity to concentrate 400 t/d of ore. The company estimated reserves of 3.87 Mt within six ore bodies. Panlong planned a two-phase project to increase the capacity of the concentrator to 800 to 1,000 t/d of ore, although no timetable for the project was given (CRU Monitor, 2005a).

In June, Zhishen Lead Industry began construction of a 100,000-t/yr lead smelter at Hanguguan Town, Lingbao City, in

Henan Province. Construction of the oxygen bottom-blowing smelter was expected to be completed by the end of 2006, with a total investment of \$35 million. Also in June, Xinhua Lead Industry began construction of the first phase of a lead smelter that is expected to produce 60,000 t/yr of lead in Wumu Village, also in Lingbao City. Completion of a second phase would add 40,000 t/yr of capacity. The aforementioned two projects are in addition to a 100,000-t/yr lead smelter, which was started in May by Xinling Lead Industry, bringing the capacity of lead smelters under construction in Lingbao City to 300,000 t/yr (CRU Monitor, 2005d).

Huludao Nonferrous Metals Group Co. Ltd., Liaoning Province, was constructing a new lead-zinc smelter. Construction of the smelter is expected to be complete by early 2006 with a planned production capacity of 30,000 t/yr lead and 60,000 t/yr zinc (CRU Monitor, 2005b).

Two firms completed secondary lead facilities in 2005. Chongqing Chunxing Alloys Co. Ltd. completed construction of a 20,000-t/yr secondary lead smelter in Chongqing Province, and Anyang Yubei Gold and Lead Co. in Henan Province completed a 50,000-t/yr plant in September. Recycled batteries were expected to be the seed material for both plants (CRU Monitor, 2005c).

To address the existing problems in China's lead and zinc industry, such as lack of raw materials, outdated technology and equipment, small plant size, and pollution, the National Development and Reform Commission conducted an investigation and released "Catalogue for Guidance of Industry Structure Adjustment 2005." According to the catalog, construction of zinc smelters with capacity less than 100,000 t/yr of zinc, lead smelters with capacity less than 50,000 t/yr of primary lead, and secondary lead smelters with capacity less than 10,000 t/yr of secondary lead will be restricted, and projects adopting backward technologies will be eliminated (Beijing Antaike Information Development Co. Ltd., 2006a, b).

At least eight lead smelters located in Anhui Province were demolished in 2005 following refusal to cease production. All these plants recycled mainly lead scrap and waste storage batteries causing severe pollution to nearby Chaohu Lake from water and gas emissions plus slag disposal. None had the required government certification or licenses and were unable to reach the standards required (CRU Monitor, 2005e, f).

Germany.—Lead and zinc smelter Sudamin Metallhuette Duisburg in Duisberg, closed completely in November because of high zinc concentrate prices and energy costs. The smelter, which produced 95,000 t/yr of refined zinc and 40,000 t/yr of lead, had ceased production in early August. The company was expected to be liquidated (CRU Monitor, 2005f).

Greece.—In October, underground operations began at Hellas Gold S.A.'s Stratoni Mine in northern Greece. In the first year of full production, the mine was expected to produce 29,000 t of lead-in-concentrate. Reserves at the mine were estimated to be 1.9 Mt at grades of 10.8% zinc, 8.1% lead, and 190 g/t silver. Production at the Stratoni lead-zinc mill resumed in September following refurbishment and was treating a 15,000-t stockpile. The mill has a capacity of 400,000 t/yr (Platts Metals Week, 2005j).

India.—Hindustan Zinc Ltd. increased estimates of reserves at its Rampura Agucha mine by 25% compared with those on March

31, 2004, which would allow the mine to continue operating for an additional 3 years. Total reserves reportedly were estimated to be 50.1 Mt grading 12.8% zinc and 1.9% lead. The company planned to continue exploration through 2006. The company's 50,000-t/yr expansion at its Chanderia lead smelter was expected to be completed in 2006 (Platts Metals Week, 2005b).

Indonesia.—Following the February release of the feasibility study on its Dairi Mine in North Sumatra, Indonesia, Australia-based Herald Resources Ltd. was planning to start concentrate shipments in 2006. The company was negotiating with two banking syndicates regarding the financing of the project. By yearend, however, financing arrangements had not been completed. After financing is completed, construction was expected to be completed in less than 18 months, and production capacity of the operation would be 220,000 t/yr of concentrate containing 70,000 t of lead and 120,000 t of zinc (Herald Resources Ltd., 2006§).

Iran.—Vancouver-based Lundin Mining Corp. purchased a 19.9% stake in Union Resources Ltd. for \$3.4 million. This share purchase was expected to provide the funds needed to complete the bankable feasibility study on Union's Mehdiabad mine project in Iran and allow the company to meet the requirements for listing on London's Alternate Investment Market. Mehdiabad was considered one of the world's leading undeveloped zinc, lead, and silver deposit. A bankable feasibility study was scheduled for completion in early 2006 (Platts Metals Week, 2005e). Measured and indicated resources at the Mehdiabad deposit were estimated to be 362 Mt grading 4.2% zinc, 1.6% lead, and 35 g/t silver (Union Resources Ltd., 2006§).

Ireland.—In April, Lundin Mining acquired ARCON International Resources Plc (County Kilkenny), which owned the Galmoy zinc-lead mine, for \$123 million. Combined with its other assets in Sweden, the Zinkgruvan and Storliden Mines, Lundin Mining increased its lead production capacity to 46,000 t/yr and zinc production capacity to 152,000 t/yr; the company also produced copper and silver byproducts. Lundin also announced that it planned to begin an aggressive exploration program in County Kilkenny (Platts Metals Week, 2005d).

Italy.—Glencore International AG announced that would close its ISF smelter at Porto Vesme, Sardinia, because of uneconomic technology and high coke costs. Operations were suspended in mid-February. The ISF smelter had a capacity of 85,000 t/yr of zinc and 40,000 t/yr of lead, but the bulk of the site's 120,000-t/yr lead capacity comes from the separate Kivcet smelter (Platts Metals Week, 2005i).

Japan.—Nippon Holdings Co. Ltd. planned to close its Toyoha Mine in Hokkaido in June 2006 because of depleted ore reserves. The mine had been shut since April 2005 because of an increase in water flowing into the mine. The mine is the country's only zinc mine, with a capacity of 83,000 t/yr of zinc concentrate, 9,000 t/yr of lead, and 30 t/yr of indium (Platts Metals Week, 2005h).

Kazakhstan.—In March, Ural Mining-Metallurgical Co. completed the first stage of updating the lead processing systems at its smelter in Vladikavkaz. Closure of a shaft furnace and the installation of three new short drum rotary furnaces was expected to bring lead production in 2005 up to 30,000 t, an increase of 5,000 t from that in 2004 (CRU Monitor, 2005b).

Mexico.—Mexico's lead mine production increased to 130,000 t in 2005 from 118,000 t in 2004 (table 13). Mexico exported an estimated 9% of its lead mine production as lead concentrates to be smelted and refined elsewhere. The first and second leading export trade partners in concentrates were China and Belgium, respectively. The leading export trade partners in lead metal were the United States and Venezuela (United Nations Statistics Division, 2006§).

In December, Great Panther Resources Ltd. began commercial production at its Topia silver-lead-zinc mine in Durango, which had produced from 1952 to 1999. A lead concentrate, which contains the silver and gold, and a zinc concentrate were being produced and will be shipped to Industrias Peñoles S.A. de C.V.'s smelter in Torreon, Coahuila. The company is using tailings from an old dump and stockpiled ore as feed material for the plant whose capacity is rated at 200 t/d. Great Panther planned to gradually increase throughput to this level by mid-2006 (Great Panther Resources Ltd., 2005§).

Pakistan.—In January, a consortium of Chinese companies signed a contract to borrow \$54 million from the China Development Bank to finance the development of the Duddar lead and zinc mine in Pakistan. The consortium, MCC Duddar Minerals Development Co. (PVT) Ltd., was composed of China Metallurgical Construction Group Corp. (51%), Hunan Zhuzhou Non-ferrous Metals Smelter Co. Ltd. (34%), and Hunan Huangshaping Lead and Zinc Mine Co. (15%). The loan was expected to fund 80% of the total investment of \$72.6 million in the project. Once completed, the mine will have the capacity to produce 100,000 t/yr of zinc concentrate and 33,000 t/yr of lead concentrate. Construction was scheduled to begin in April, with production starting by the end of 2007 (Platts Metals Week, 2005a).

Peru.—At its La Oroya lead-zinc-copper smelter, Doe Run Peru S.R. Ltd. expected to complete eight of the nine projects required by the Environmental Adjustment and Management Program (PAMA) by the end of 2009. The final project includes the construction of three sulfuric acid plants. The acid plant for the zinc circuit was expected to be completed by the end of 2006; the lead circuit by 2008; and the copper circuit by the end of 2009. The company was seeking more time to complete an additional project at the metals processing facility. The company's investment in PAMA mandated projects was expected to be \$200 million (Doe Run Peru S.R. Ltd., 2006). In the fiscal year ending October 31, 2005, Doe Run Peru produced 121,000 t of refined lead, a slight increase from that in 2004 (Doe Run Resources Corporation, 2006§).

Vietnam.—The Ta Pan zinc-lead plant in Ha Giang Province began production in mid-December. The plant was constructed in early 2004 at a cost of more than \$1 million, at least \$750,000 of which was contributed by China. The plant has the capacity to refine 300 t/d of ore, producing 5,800 to 6,000 t/yr of refined metal for domestic consumption and export (CRU Monitor, 2006).

Outlook

World usage of refined lead is forecast to increase in 2006 and 2007. The largest increase, 3.3%, will take place in 2006. Demand in Europe is expected to remain at 2005 levels in 2006

and 2007. In the United States, demand is forecast to decline 3% in 2007 despite a slight increase in demand for SLI batteries in 2006. Consumption in China is expected to increase by 10% in 2006 and 2007 because of increased domestic and export demands for lead-base batteries. Similarly, increases in consumption of lead are anticipated in India, Mexico, and Thailand. In general, regional consumption of refined lead metal has already shifted and probably will continue to shift as battery manufacturers, the major consumer of refined lead, seek out lower cost areas in which to set up manufacturing facilities.

Sales of refined lead metal for automotive batteries and industrial batteries for telecommunications and information technology industries are expected to account for an increasingly larger share of the market, as environmental concerns discourage use in other markets. Currently, SLI and industrial lead-acid batteries account for 75% to 85% of world lead usage.

On the supply side, global lead mine production was expected to increase 1.3% in 2006. Growth in 2007 was predicted to be 8.8%. Several mines that have recently reopened in Europe, along with increased output in Russia, could boost European lead production by 9.4% in 2006 and 17.2% in 2007. Increased production, 8.5% in 2006 and 10% in 2007, also is expected in China, where several new mines were commissioned.

Primarily because of increased production in China, global output of refined lead was forecast to increase by 6.1% in 2006 and 3% in 2007. A western world supply excess of 32,000 t was anticipated in 2006 (International Lead and Zinc Study Group, 2006).

Mine production in the United States declined in recent years but through July 2006 production has been 1% greater than that of 2005. As a result, U.S. mine output is expected to be unchanged or slightly greater in 2006 than in 2005. Primary refined lead production declined 49% since 2001 or 12% per year. The leveling off of this downward trend in 2005 suggests that the decline in primary U.S. refined lead production in 2006 will be much less than in recent years. Secondary production of lead increased slightly since 2001 but probably will remain unchanged or increase only slightly in 2006.

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TABLE 1
SALIENT LEAD STATISTICS¹

		2001	2002	2003	2004	2005
United States:						
Production:						
Mine, recoverable lead content: ²						
Quantity	metric tons	450,000 ^r	440,000	449,000	430,000	426,000
Value	thousands	\$433,000	\$423,000	\$433,000	\$415,000	\$574,000
Primary lead, refined, lead content:						
Domestic ores and base bullion	metric tons	290,000	262,000	245,000	148,000	143,000
Foreign ores and base bullion	do.	(3)	(3)	--	--	NA
Secondary lead, lead content	do.	1,090,000 ^r	1,100,000 ^r	1,140,000	1,130,000 ^r	1,140,000
Exports, lead content:						
Lead ore and concentrates	do.	181,000	241,000	253,000	292,000	390,000
Lead materials, excluding scrap	do.	38,100 ^r	43,400	123,000	82,600	64,800
Imports for consumption, lead content:						
Lead in ore and concentrates	do.	2,240	6	--	--	--
Lead in base bullion	do.	--	--	6 ^r	3 ^r	29
Lead in pigs, bars, and reclaimed scrap	do.	271,000	210,000	175,000	197,000	298,000
Stocks, December 31, lead content:						
Primary lead	do.	(4)	(4)	W	W	W
At consumers and secondary smelters	do.	100,000	111,000	84,600	59,000	64,700
Consumption of metal, primary and secondary, lead content	do.	1,550,000	1,440,000	1,390,000	1,480,000	1,460,000
Price, North American Producer average, delivered ⁵	cents per pound	43.64	43.56	43.76	55.14	61.03
World:						
Production, gross weight:						
Mine	thousand metric tons	3,100,000 ^r	2,880,000 ^r	3,190,000 ^r	3,160,000 ^r	3,320,000
Refinery ⁶	do.	3,400,000 ^r	3,400,000 ^r	3,330,000 ^r	3,340,000 ^r	3,730,000
Secondary refinery	do.	3,200,000 ^r	3,370,000 ^r	3,450,000 ^r	3,620,000 ^r	3,740,000
Price, London Metal Exchange, pure lead, cash average ⁵	cents per pound	21.58	20.52	23.34	40.19	44.23

^rRevised. NA Not available. W Withheld to avoid disclosing company proprietary data. -- Zero.

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

²Lead recoverable after smelting and refining. Number in table 14 represents lead in concentrate.

³Withheld to avoid disclosing company proprietary data; included with "Primary lead, refined, lead content: Domestic ores and base bullion."

⁴Withheld to avoid disclosing company proprietary data; included with stocks at consumers and secondary smelters.

⁵Platts Metals Week.

⁶Primary metal production only; includes secondary metal production, where inseparable.

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

(Metric tons, lead content)

State	2004 ^r	2005
Alaska and Missouri	407,000	397,000
Other States ²	23,400	29,500
Total	430,000	426,000

^rRevised.

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

²Idaho, Montana, Nevada, and Washington.

TABLE 3
LEADING LEAD-PRODUCING MINES IN THE UNITED STATES IN 2005, IN ORDER OF OUTPUT¹

Rank	Mine	County and State	Operator	Source of lead
1	Red Dog	Northwest Arctic, AK	Teck Cominco Alaska Inc.	Zinc-lead ore.
2	Buick	Iron, MO	Doe Run Resources Corp.	Lead ore.
3	Brushy Creek	Reynolds, MO	do.	Do.
4	Fletcher	do.	do.	Do.
5	Viburnum (#29 and #35)	Iron, MO	do.	Do.
6	Sweetwater	Reynolds, MO	do.	Do.
7	Greens Creek	Juneau, AK	Kennecott Greens Creek Mining Co.	Zinc ore.
8	Lucky Friday	Shoshone, ID	Hecla Mining Company	Silver ore.
9	Pend Oreille	Pend Oreille, WA	Teck Cominco American Inc.	Zinc-lead ore.
10	Montana Tunnels	Jefferson, MT	Apollo Gold Corp.	Gold ore.

¹The mines on this list accounted for 100% of the U.S. mine production in 2005.

TABLE 4
LEAD RECOVERED FROM SCRAP PROCESSED IN THE UNITED STATES,
BY KIND OF SCRAP AND FORM OF RECOVERY¹

(Metric tons, lead content, unless otherwise specified)

	2004	2005
Kind of scrap:		
New scrap:		
Lead-base	12,500	14,200
Copper-base	--	--
Tin-base	329	1,530
Total	12,900	15,800
Old scrap:		
Battery-lead	1,060,000 ^r	1,050,000
All other lead-base	49,100 ^r	80,500
Copper-base	--	--
Total	1,110,000 ^r	1,130,000
Grand total	1,130,000 ^r	1,140,000
Form of recovery:		
As soft lead	841,000 ^r	869,000
In antimonial lead	283,000 ^r	271,000
In other lead alloys	2,960	4,490
In copper-base alloys	--	--
Total:		
Quantity	1,130,000 ^r	1,140,000
Value ² thousands	\$1,370,000 ^r	\$1,540,000

^rRevised. NA Not available. -- Zero.

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

²Value based on average quoted price of common lead.

TABLE 5
U.S. CONSUMPTION OF LEAD, BY PRODUCT¹

(Metric tons, lead content)

SIC ² code	Product	2004	2005
Metal products:			
3482	Ammunition, shot and bullets	61,500	61,300
Bearing metals:			
35	Machinery except electrical	--	W
36	Electrical and electronic equipment	W	--
371	Motor vehicles and equipment ³	W	W
37	Other transportation equipment	W	W
Total		1,300	1,180
3351	Brass and bronze, billets and ingots	2,390	2,100
36	Cable covering, power and communication	(4)	(4)
15	Calking lead, building construction	(4)	(4)
Casting metals:			
36	Electrical machinery and equipment	-- ^r	W
371	Motor vehicles and equipment	W	W
37	Other transportation equipment	W	W
3443	Nuclear radiation shielding	W	W
Total		17,900	19,500
Pipes, traps, other extruded products:			
15	Building construction	W	1,220
3443	Storage tanks, process vessels, etc.	(5)	(5)
Total		W	1,220
Sheet lead:			
15	Building construction	20,700 ^r	23,100
3443	Storage tanks, process vessels, etc.	(5)	(5)
3693	Medical radiation shielding	W	W
Total		31,600 ^r	29,000
Solder:			
15	Building construction	777	W
	Metal cans and shipping containers	W	W
367	Electronic components, accessories and other electrical equipment	6,380 ^r	7,720
371	Motor vehicles and equipment	W	W
Total		7,440	8,370
Storage batteries:			
3691	Storage battery grids, post, etc.	657,000	581,000
3691	Storage battery oxides	630,000	705,000
Total storage batteries		1,290,000	1,290,000
371	Terne metal, motor vehicles and equipment	--	--
27	Type metal, printing and allied industries	--	(6)
34	Other metal products ⁷	W	500
Grand total		1,420,000	1,410,000
Other oxides:			
285	Paint	W	W
32	Glass and ceramics products	W	W
28	Other pigments and chemicals	W	W
Total		25,700	14,100
Miscellaneous uses		33,900	32,900
Grand total		1,480,000	1,460,000

^rRevised. W Withheld to avoid disclosing company proprietary data; included in appropriate totals. -- Zero.

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

²SIC Standard Industrial Classification.

³Includes "Metal products: Storage batteries: Terne metal, motor vehicles and equipment."

⁴Included in "Metal products: Grand total."

⁵Included with "Metal products: Sheet lead: Building construction" to avoid disclosing company proprietary data.

⁶Included with "Metal products: Storage batteries: Other metal products" to avoid disclosing company proprietary data.

⁷Includes lead consumed in foil, collapsible tubes, annealing, galvanizing, plating, electrowinning, and fishing weights.

TABLE 6
U.S. CONSUMPTION OF LEAD IN 2005, BY STATE^{1,2}

(Metric tons, lead content)

State	Refined soft lead	Lead in antimonial lead	Lead in alloys	Lead in copper-base scrap	Total
California and Washington	26,000	1,160	4,290	--	31,500
Illinois	6,490	30,000	(3)	--	36,400
Iowa, Michigan, Missouri	4,640	W	W	--	7,390
Ohio and Pennsylvania	95,300	117,000	34,600	670	247,000
Arkansas and Texas	60,000	18,200	7,080	--	85,300
Alabama, Georgia, and Oklahoma	27,000	W	W	--	52,800
Colorado, Indiana, Kansas, Kentucky, Minnesota, Nebraska, Tennessee, Wisconsin	263,000	55,200	52,300	630	371,000
Connecticut, Maryland, New Jersey, New York, North Carolina, South Carolina	20,100	14,100	6,390	--	40,700
Various States ⁴	326,000	78,200	185,000	--	589,000
Total	829,000	309,000	323,000	1,300	1,460,000

W Withheld to avoid disclosing company proprietary data. -- Zero.

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

²Includes lead that went directly from scrap to fabricated products.

³Included in lead in antimonial lead to avoid disclosing company proprietary data.

⁴Includes companies that do not breakup their numbers by State.

TABLE 7
U.S. CONSUMPTION OF LEAD IN 2005, BY CLASS OF PRODUCT^{1,2}

(Metric tons, lead content)

Product	Soft lead	Lead in antimonial lead	Lead in alloys	Lead in copper-base scrap	Total
Metal products	51,400	69,100	8,460	W	129,000
Storage batteries	750,000	240,000	295,000	--	1,290,000
Other oxides	W	(3)	(3)	--	W
Miscellaneous	27,600	(3)	(3)	1,300	47,800
Total	829,000	309,000	323,000	1,300	1,460,000

W Withheld to avoid disclosing company proprietary data; included with "Miscellaneous." -- Zero.

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

²Includes lead that went directly from scrap to fabricated products.

³Withheld to avoid disclosing company proprietary data; included with "Total."

TABLE 8
STOCKS OF LEAD AT CONSUMERS AND SECONDARY SMELTERS
IN THE UNITED STATES, DECEMBER 31^{1,2}

(Metric tons, lead content)

Year	Refined soft lead	Lead in antimonial lead	Lead in alloys	Lead in copper-base scrap	Total
2004	34,400	11,500	W	W	59,000
2005	33,600	15,400	W	W	64,700

W Withheld to avoid disclosing company proprietary data; included in totals.

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

²Includes stocks at primary refineries.

TABLE 9
 PRODUCTION AND SHIPMENTS OF LEAD PIGMENTS AND OXIDES IN THE UNITED STATES^{1,2}

(Metric tons and dollars)

Product	2004				2005			
	Production		Shipments		Production		Shipments	
	Gross weight	Lead content	Quantity (lead content)	Value ³	Gross weight	Lead content	Quantity (lead content)	Value ³
Litharge, red lead and white lead, dry	1,300	1,180	15,000	9,560,000	--	--	10,200	10,800,000
Lead oxide	663,000	630,000	NA	NA	742,000	705,000	NA	NA
Total	665,000 ^r	631,000 ^r	NA	NA	742,000	705,000	NA	NA

^rRevised. NA Not available. -- Zero.

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

²Excludes basic lead sulfate to avoid disclosing company proprietary data.

³At plant, exclusive of container.

TABLE 10
 U.S. IMPORTS FOR CONSUMPTION OF LEAD PIGMENTS AND COMPOUNDS, BY KIND¹

Kind	Quantity (metric tons, lead content)	Value (thousands)
2004:		
White lead carbonate	--	--
Red and orange lead	323	\$549
Chrome yellow, molybdenum orange pigments, lead-zinc chromates	7,040	18,800
Litharge	983	878
Glass frits (undifferentiated)	24,900	27,800
Total	33,200	48,000
2005:		
White lead carbonate	--	--
Red and orange lead	355	543
Chrome yellow, molybdenum orange pigments, lead-zinc chromates	6,260	19,800
Litharge	967	1,390
Glass frits (undifferentiated)	24,900	33,700
Total	32,500	55,500

-- Zero.

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

Source: U.S. Census Bureau.

TABLE 11
U.S. EXPORTS OF LEAD, BY COUNTRY¹

Country	2004		2005	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Ore and concentrates, lead content:				
Australia	157	\$13	--	--
Belgium	14,800	13,900	11,500	\$7,780
Bulgaria	2,890	1,990	5,760	3,880
Canada	31,500	17,200	145,000	54,400
China	98,000	56,000	115,000	75,300
India	--	--	219	134
Japan	63,500	31,700	47,800	20,200
Korea, South	52,800	22,600	31,200	10,000
Mexico	22,000	9,910	6,650	2,530
South Africa	56	17	--	--
Switzerland	59	75	27,100	16,100
Taiwan	5,770	3,970	--	--
Other	16	15	44	21
Total	292,000	157,000	390,000	190,000
Base bullion, lead content:				
Japan	58	757	91	1,180
Mexico	70	84	82	80
Other	--	--	25	28
Total	129	841	198	1,290
Unwrought lead and lead alloys, lead content:				
Australia	74	78	4	29
Belgium	8,640	6,700	494	612
Brazil	1,200	943	⁽²⁾	3
Canada	2,460	2,220	1,810	1,810
Colombia	6	31	37	471
Dominican Republic	132	201	1	3
France	30	296	18	103
Germany	47	112	26	36
Haiti	116	112	--	--
Hong Kong	--	--	158	87
India	1,550	1,270	12	28
Ireland	36	22	--	--
Israel	38	525	111	1,370
Italy	2,500	1,870	15	11
Japan	32	52	331	303
Korea, South	2,900	2,730	1,460	1,470
Malaysia	775	746	--	--
Mexico	24,800	22,000	39,700	37,400
Poland	304	334	3	57
Portugal	1,260	945	--	--
Saudi Arabia	⁽²⁾	9	116	71
Singapore	18	17	53	57
Spain	--	--	98	633
Taiwan	4,520	3,700	42	57
Tunisia	499	348	--	--
Turkey	1,110	868	--	--
United Kingdom	5,410	3,630	1,010	963
Other	42	221	39	106
Total	58,600	50,100	45,500	46,100

See footnotes at end of table.

TABLE 11—Continued
U.S. EXPORTS OF LEAD, BY COUNTRY¹

Country	2004		2005	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Wrought lead and lead alloys, lead content:				
Armenia	--	--	97	\$35
Belgium	146	\$2,310	257	2,190
Brazil	130	259	149	1,090
Canada	3,750	7,310	1,660	4,570
China	1,270	2,660	1,050	3,170
Costa Rica	1,020	2,590	1,210	3,410
Dominican Republic	5	10	169	249
France	34	204	138	238
Germany	2,980	2,770	2,560	2,560
Hong Kong	1,640	2,610	1,250	2,810
India	211	261	409	592
Ireland	42	284	155	496
Israel	36	122	55	125
Italy	113	91	87	143
Japan	295	1,860	509	1,200
Korea, South	975	1,270	25	170
Malaysia	851	2,260	2,330	4,420
Mexico	4,140	6,360	3,110	6,260
Netherlands	86	631	107	382
Philippines	1,910	2,050	2,720	3,000
Saudi Arabia	32	108	20	58
Singapore	405	444	76	115
Sweden	8	15	26	71
Switzerland	79	86	121	145
Taiwan	2,080	1,990	51	1,090
United Arab Emirates	40	95	21	30
United Kingdom	852	1,280	436	849
Venezuela	93	78	68	185
Other	573	2,290	153	1,170
Total	23,800	42,300	19,000	40,800
Scrap, gross weight:				
Belgium	114	189	64	110
Canada	44,400	8,500	53,400	12,400
China	174	118	2,120	2,040
Dominican Republic	674	805	20	35
El Salvador	--	--	26	34
Finland	--	--	351	651
Guatemala	87	85	11	29
Honduras	--	--	82	175
Hong Kong	46	31	162	66
India	1,280	1,030	3,560	2,130
Korea, South	8,800	3,140	6,820	3,100
Mexico	268	195	32	55
Pakistan	--	--	166	48
Sri Lanka	39	17	138	60
United Kingdom	--	--	114	246
Vietnam	--	--	186	66
Other	428	641	75	394
Total	56,300	14,800	67,300	21,600

-- Zero.

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

²Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 12
U.S. IMPORTS FOR CONSUMPTION OF LEAD, BY COUNTRY¹

Country	2004		2005	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Pigs and bars, lead content:				
Argentina	133	\$115	113	\$120
Australia	13,700	10,700	39,600	38,900
Belgium	26	178	51	334
Canada	166,000	149,000	190,000	199,000
China	2	4	22,700	22,500
Colombia	80	58	302	270
Germany	309	1,410	107	488
Japan	--	--	228	229
Mexico	8,810	5,110	15,200	12,300
Panama	375	235	--	--
Peru	7,270	7,220	23,900	24,400
Poland	126	107	--	--
United Kingdom	--	--	5,460	4,830
Venezuela	367	318	--	--
Other	29	64 ^r	25	68
Total	197,000	175,000	298,000	303,000
Reclaimed scrap, including ash and residues, lead content:				
Canada	612	446	1,070	1,050
Chile	--	--	32	27
Colombia	3,280	2,290	1,060	897
Guatemala	--	--	110	116
Mexico	525	669	1,020	711
Russia	311	75	22	20
Tunisia	--	--	28	59
Venezuela	40	30	--	--
Other	14	7	--	--
Total	4,780	3,510	3,340	2,880
Wrought lead, all forms, including wire and powders, gross weight:				
Argentina	376	409	1,060	1,370
Australia	--	--	28	105
Austria	--	--	215	889
Canada	4,530	8,010	5,190	11,000
Chile	1,150	1,740	--	--
China	922	3,380	792	2,950
Colombia	120	76	3	3
El Salvador	--	--	120	185
France	50	187	78	242
Germany	843	3,550	982	3,980
Japan	21	182	7	163
Mexico	1,110	937	1,970	2,040
Netherlands	321	1,570	334	1,780
New Zealand	33	364	66	675
Peru	6	3	79	143
Russia	155	852	59	352
Taiwan	182	675	136	529
Turkey	--	--	40	65
United Kingdom	1,050	2,280	645	1,360
Other	104	960	92	994
Total	11,000	25,200	11,900	28,900

^rRevised. -- Zero.

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

Source: U.S. Census Bureau.

TABLE 13
LEAD: WORLD MINE PRODUCTION OF LEAD IN CONCENTRATE, BY COUNTRY^{1,2}

(Metric tons, lead content)

Country ³	2001	2002	2003	2004	2005
Algeria	891 ^r	1,105	--	--	--
Argentina	12,334	12,011	12,079	9,551	10,000
Australia	714,000	683,000 ^r	690,000 ^r	678,000 ^r	776,000
Bolivia	8,857	9,893	9,740	10,267 ^r	10,700
Bosnia and Herzegovina ^c	200	200	200	200	200
Brazil	10,725	9,253	10,652	14,734 ^r	15,000 ^p
Bulgaria	18,500	21,800	17,000 ^e	13,000 ^e	13,000 ^e
Burma ^c	900	900	500	500	500
Canada	153,932	101,330	92,934 ^r	71,122 ^r	72,500 ^p
Chile	1,193	2,895 ^r	1,697 ^r	2,286 ^r	878
China ^c	676,000	641,000	955,000	998,000 ^r	1,000,000
Colombia ^c	220	220	220	220	220
Ecuador ^c	200	200	200	220	220
Georgia ^c	200	400	400	400	400
Greece ^c	27,700	29,300	2,000	--	1,500
Honduras	6,750	8,128	9,014 ^r	8,877 ^r	10,488
India	32,000	34,000	44,000	51,000 ^e	58,000 ^p
Iran ^{e,4}	19,000 ^r	19,000 ^r	20,000 ^r	22,000 ^r	22,000
Ireland ^c	44,500	32,000	50,000	65,000	63,800
Italy ^c	1,000 ^r	500 ^r	500 ^r	500 ^r	500
Japan	4,997	5,723	5,660	5,512 ^r	3,437
Kazakhstan ^c	37,700 ⁵	40,000	44,000	44,000	44,000
Korea, North ^c	9,000 ^r	10,000 ^r	20,000 ^r	20,000 ^r	20,000
Korea, Republic of	988	28	--	40 ^r	--
Macedonia	9,700	3,500	5,000	-- ^c	-- ^c
Mexico	139,000	138,707	139,348	118,484 ^r	130,000 ^e
Morocco	76,747	62,400 ^r	38,600 ^r	31,300 ^{r,c}	31,000 ^e
Namibia	12,088 ^r	13,809 ^r	18,782 ^r	14,338 ^r	14,320
Peru	289,546	297,704	307,755	306,211	319,345
Poland	52,600	56,600	42,000	40,000 ^e	48,000 ^e
Romania	19,676	15,136	18,102	18,000 ^e	18,000 ^e
Russia ^c	12,300	19,000	24,000	23,000 ^r	36,000
Saudi Arabia ^c	60	60	60	30	30
Serbia and Montenegro	7,500	--	400	-- ^c	-- ^c
South Africa	50,771	49,444	39,941	37,485	42,159 ^p
Spain	36,000	6,000	2,000 ^e	-- ^c	2,000 ^e
Sweden	85,975	44,000 ^r	51,000 ^e	55,000	61,000
Tajikistan ^c	800	800	800	800	800
Thailand	500	3,200	--	-- ^c	--
Tunisia	6,820	5,081	5,000 ^e	5,500 ^{r,c}	8,800 ^e
Turkey	17,923	17,352	14,000 ^e	12,000 ^e	12,000 ^e
United Kingdom ^c	1,000	1,000	--	--	--
United States	450,256 ^r	440,086 ^r	448,661 ^r	430,006 ^r	426,350
Vietnam ^c	900 ^r	1,100 ^r	1,100 ^r	1,100 ^r	1,200
Total	3,050,000 ^r	2,840,000 ^r	3,140,000	3,110,000	3,270,000

^cEstimated. ^pPreliminary. ^rRevised. -- Zero.

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

²Table includes data available through July 7, 2006.

³In addition to the countries listed, lead is also produced in Nigeria, but information is inadequate to formulate reliable estimates of output levels.

⁴Year beginning March 21 of that stated.

⁵Reported figure.

TABLE 14
LEAD: WORLD REFINERY PRODUCTION, BY COUNTRY^{1,2}

(Metric tons)

Country ³	2001	2002	2003	2004	2005 ^c
Algeria:^c					
Primary	-- ^r	-- ^r	-- ^r	--	--
Secondary	6,100 ^r	6,000 ^r	6,000 ^r	5,000	5,000
Total	6,100 ^r	6,000 ^r	6,000 ^r	5,000	5,000
Argentina:					
Primary	9,473	10,567	11,011	9,500 ^{r,e}	10,000
Secondary	25,960	33,000	30,300	39,600 ^{r,e}	39,000
Total	35,433	43,567	41,311	49,100 ^{r,e}	49,000
Australia:					
Primary	270,000	268,400 ^r	267,700 ^r	239,000 ^r	229,300 ⁴
Secondary	33,000	33,600 ^r	39,300 ^r	34,000 ^r	38,700 ⁴
Total	303,000	302,000 ^r	307,000 ^r	273,000	268,000 ⁴
Austria, secondary^c	22,000	21,000	18,000	20,000	20,000
Belgium:^c					
Primary ⁵	76,000	68,000	45,000	43,000	63,000
Secondary	20,000	20,000	20,000	20,000	20,000
Total	96,000	88,000	65,000	63,000	83,000
Bolivia	106 ^r	100 ^{r,e,6}	100 ^{r,e,6}	539 ^r	540
Brazil, secondary	50,000 ⁷	50,000 ^{e,7}	50,000 ^e	52,000 ^r	52,000 ^p
Bulgaria:^c					
Primary	75,000	57,000	60,000	55,000 ^r	65,000
Secondary	13,600	9,000	9,000	10,000 ^r	15,000
Total	88,600	66,000	69,000	65,000 ^r	80,000
Burma, primary	1,105 ^r	425 ^r	888	289 ^r	300
Canada:					
Primary	127,007	136,896 ^r	118,506	131,015	132,000 ^p
Secondary	103,921	114,664 ^r	104,927 ^r	110,382	112,000 ^p
Total	230,928	251,560 ^r	223,433 ^r	241,397	244,000 ^p
China:^c					
Primary	984,000	1,100,000	1,290,000	1,500,000	1,870,000
Secondary	211,000	230,000	290,000	430,000 ^r	520,000
Total	1,200,000	1,330,000	1,580,000	1,930,000 ^r	2,390,000
Colombia, secondary^c	12,000	12,000	12,000	12,000	12,000
Czech Republic, secondary^c	15,000	29,000 ^r	26,000 ^r	25,000 ^r	26,000
El Salvador, secondary	7,000	8,000	8,000	10,000	10,000
Estonia, secondary	--	--	--	3,000	7,000
France:^c					
Primary	96,000	76,000	14,000	--	--
Secondary	142,000	128,000	80,000	104,000	105,000
Total	238,000	204,000	94,000	104,000	105,000
Germany:					
Primary	155,862 ^r	141,202 ^r	132,155 ^r	115,869 ^r	116,000
Secondary	217,500 ^r	238,700	222,400 ^r	243,304 ^r	243,000
Total	373,362 ^r	379,902 ^r	354,555 ^r	359,173 ^r	359,000
Greece, secondary	5,000	5,000	4,000	4,000	4,000
India:^c					
Primary	74,400	51,500 ^r	51,200 ^r	33,700 ^r	38,900 ^p
Secondary	22,000	26,500 ^r	26,300 ^r	15,300 ^r	20,100 ^p
Total	96,400	78,000 ^r	77,500 ^r	49,000 ^r	59,000 ^p
Indonesia, secondary	18,000	17,000	18,000	20,000	18,000
Iran:^c					
Primary	12,000	12,000	11,342 ^{r,4}	17,857 ^{r,4}	18,000
Secondary	38,000	39,000 ^r	47,000 ^r	50,000 ^r	50,000
Total	50,000	51,000 ^r	58,342 ^{r,4}	67,857 ^{r,4}	68,000

See footnotes at end of table.

TABLE 14—Continued
LEAD: WORLD REFINERY PRODUCTION, BY COUNTRY^{1,2}

(Metric tons)

Country ³	2001	2002	2003	2004	2005 ^c
Ireland, secondary ^c	13,000	7,000	9,000	21,000	20,000
Israel, secondary	20,000	22,000	25,000	27,000	27,000
Italy: ^c					
Primary	82,000	75,000	48,000	45,000	45,000
Secondary	121,000	130,000	166,000	165,000	161,000
Total	203,000	205,000	214,000	210,000	206,000
Japan:					
Primary	127,358	107,744	105,460 ^r	94,272 ^r	106,638 ⁴
Secondary	175,088	178,016	189,831	188,603 ^r	167,980 ⁴
Total	302,446	285,760	295,291 ^r	282,875 ^r	274,618 ⁴
Kazakhstan, primary and secondary	158,700	161,800	133,200	157,000 ^e	131,316 ⁴
Kenya, secondary	1,000	1,000	1,000	1,000	1,000
Korea, North, primary and secondary ^c	7,000 ^r	6,000 ^r	7,000 ^r	9,000 ^r	9,000
Korea, Republic of:					
Primary	161,000	178,722	169,297 ^r	173,609 ^r	175,000
Secondary ^c	10,000	63,900	60,000	60,000 ⁴	50,000
Total	171,000	242,622	229,297 ^r	233,609 ^r	225,000
Macedonia: ^c					
Primary	19,000	19,000	6,000	--	--
Secondary	1,000	1,000	400	300 ^r	300
Total	20,000	20,000	6,400	300 ^r	300
Malaysia, secondary ^{c,8}	42,000	40,000	57,000	54,000	71,000
Mexico:					
Primary ⁹	143,523	128,241	137,482	137,090 ^r	150,000
Secondary ^c	110,000	110,000	110,000	110,000	110,000
Total	253,523	238,241	247,482	247,090 ^r	260,000
Morocco:					
Primary	58,178	71,840	61,473	35,000 ^r	35,000
Secondary ^c	3,000	3,000	3,000	3,000 ^r	4,000 ⁴
Total	61,178	74,840	64,473	38,000 ^r	39,000
Netherlands, secondary ^e	24,000	25,000	17,000	17,000	20,000
New Zealand, secondary ^c	10,000	9,000 ^r	8,000 ^r	8,000 ^{r,4}	7,000 ⁴
Nigeria, secondary ^c	5,000	5,000	5,000	5,000	5,000
Pakistan, secondary ^c	3,000	3,000 ^r	3,000	3,000	3,000
Peru, primary	121,181	119,588	112,289	118,570	122,079 ⁴
Philippines, secondary ^c	24,000	26,000 ^r	27,000	29,000	29,000 ⁴
Poland: ^c					
Primary	30,000 ^r	30,000	28,000	25,000 ^r	30,000
Secondary	20,000	35,800	40,000	40,000	40,000
Total	50,000 ^r	65,800	68,000	65,000 ^r	70,000
Portugal, secondary ^c	6,000	4,000	4,000	4,000	4,000
Romania: ^c					
Primary	24,000	26,000	23,100	25,000	25,000
Secondary	3,000	3,000	5,000	3,000	3,000
Total	27,000	29,000	28,100	28,000	28,000
Russia, primary and secondary ^c	67,500	60,350 ⁴	66,000	70,000 ^r	66,000
Saudi Arabia, secondary	16,000	17,000	25,000	32,000	36,000
Serbia and Montenegro, primary ^c	--	170	--	--	--
Slovenia, secondary ^c	15,000	15,000	15,000	15,000	15,000
South Africa, secondary	55,000	61,000	64,900	64,100 ^r	65,000
Spain, secondary ^c	98,000	116,000	102,000	105,000	106,000

See footnotes at end of table.

TABLE 14—Continued
LEAD: WORLD REFINERY PRODUCTION, BY COUNTRY^{1,2}

(Metric tons)

Country ³	2001	2002	2003	2004	2005 ^c
Sweden: ^c					
Primary	31,322 ⁴	28,000 ^r	24,200	30,200 ^{r,4}	27,400
Secondary	44,056 ⁴	37,000 ^r	52,000	52,000 ^{r,4}	45,600
Total	75,378 ⁴	65,000 ^r	76,200	82,200 ^{r,4}	73,000
Switzerland, secondary ^c	9,000	9,000	8,000	9,000	9,000
Taiwan, secondary	62,000	55,000	56,000	56,000	55,000 ^p
Thailand:					
Primary	-- ^r	-- ^r	-- ^r	-- ^r	--
Secondary	30,000 ^r	42,900 ^r	45,300 ^r	57,500 ^r	61,000
Total	30,000 ^r	42,900 ^r	45,300 ^r	57,500 ^r	61,000
Trinidad and Tobago, secondary ^c	1,600	1,600	1,000 ^r	1,000 ^r	1,000
Turkey: ^c					
Primary	-- ^r	-- ^r	-- ^r	-- ^r	--
Secondary	4,000 ^r	6,000 ^r	6,000 ^r	6,000 ^r	6,000
Total	4,000 ^r	6,000	6,000	6,000	6,000
Ukraine, secondary ^c	12,000	12,000	7,000	7,000	6,000
United Arab Emirates, secondary ^c	2,000	2,000	2,000	2,000	2,000
United Kingdom: ^c					
Primary	203,000	205,000	162,000	123,000	120,000
Secondary	163,000	165,000	158,000	120,000	120,000
Total	366,000	370,000	320,000	243,000	240,000
United States:					
Primary	290,000	262,000	245,000	148,000	143,000
Secondary	1,100,000	1,120,000	1,140,000	1,110,000	1,140,000
Total	1,390,000	1,380,000	1,380,000	1,260,000	1,280,000
Venezuela, secondary ^c	30,000	30,000	30,000	30,000	30,000
Zambia, secondary ^c	1,000	1,000	1,000	1,000	1,000
Grand total:	6,600,000 ^r	6,780,000 ^r	6,780,000 ^r	6,950,000 ^r	7,470,000
Of which					
Primary	3,170,000 ^r	3,170,000 ^r	3,120,000 ^r	3,100,000 ^r	3,520,000
Secondary	3,200,000 ^r	3,370,000 ^r	3,450,000 ^r	3,620,000 ^r	3,740,000
Undifferentiated	233,000 ^r	228,000 ^r	206,000 ^r	237,000 ^r	207,000

^cEstimated. ^pPreliminary. ^rRevised. -- Zero.

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

²Table includes data available through July 7, 2006. Data included represent the total output of refined lead by each country, whether derived from ores and concentrates (primary) or scrap (secondary), and include the lead content of antimonial lead but exclude, to the extent possible, simple remelting of scrap.

³In addition to the countries listed, Egypt and Iraq produced secondary lead, but output is not officially reported; available general information is inadequate for the formulation of reliable estimates of output levels.

⁴Reported figure.

⁵Derived by calculating reported total lead output plus exports of lead bullion minus imports of lead bullion.

⁶For 2002 and 2003, the only production of refined lead that was reported consisted of small amounts recovered as a byproduct at Empresa Metalúrgica de Vinto.

⁷Source: Lead and Zinc Statistics, Monthly Bulletin of the International Lead and Zinc Study Group, v. 42, no. 6, June 2002.

⁸Metal Reclamation Industries' secondary lead smelter is receiving some primary mine concentrates from the Magellan Mine (Australia). The ore minerals are lead oxides and can be smelted at a secondary smelter.

⁹Includes lead content in antimonial lead.