



# 2015 Minerals Yearbook

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**LEAD [ADVANCE RELEASE]**

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# LEAD

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In 2015, domestic mine production of recoverable lead was 360,000 metric tons (t), slightly less than that in 2014 (table 1), primarily owing to production decreases in Alaska. The value of domestic mine production in 2015 (based on the North American Market price) decreased by 16% to \$724 million owing primarily to a decline in the price of lead. In the United States, lead in concentrate was produced at 10 mines that employed about 1,840 people. Alaska and Missouri were the principal producing States accounting for the majority of domestic mine production. Primary lead metal has not been produced in the United States since the closure of the last operating smelter at yearend 2013.

Secondary (recycled) lead, derived principally from scrapped lead-acid batteries, increased slightly from that in 2014 and accounted for 100% of refined lead production in the United States in 2015 (table 1). Nearly all the secondary lead was produced by seven companies operating 11 smelters.

World mine production of lead decreased by 9% to 4.95 million metric tons (Mt) from 5.44 Mt in 2014 owing primarily to a 17% production decline in China. The United States continued to be the third-leading producer and accounted for about 7% of global lead mine production. China and Australia were the two leading producers in 2015, accounting for 47% and 13%, respectively, of global lead mine production (table 11). World production of refined lead (primary and secondary) was 10.4 Mt, about 3% less than that in 2014. The United States continued to be the second-leading global producer of refined lead after China and accounted for 10% of total global production and 18% of global secondary refined production. China produced about 43% of total global refined lead and 27% of secondary refined lead production in 2015 (table 12).

Lead metal was consumed domestically by more than 70 companies to manufacture such products as ammunition; building-construction materials; covering for power and communication cable; lead-acid storage batteries; lead oxides for ceramics, chemicals, glass, and pigments; lead sheet; and solders for construction, electronic components and accessories, metal containers, and motor vehicles.

Lead-acid batteries, including starting-lighting-ignition (SLI) and industrial batteries, continued to be the dominant use of lead, accounting for about 86% of reported lead consumption (table 4). In 2015, North American producers shipped 127 million SLI automotive-type original equipment (OE) and replacement batteries, 1.02 million more than the amount shipped in 2014 (Battery Council International, 2016, p. 23–24).

According to the International Lead and Zinc Study Group (ILZSG), global consumption of refined lead in 2015 was 10.6 Mt, slightly less than that in 2014. The leading refined-lead-consuming countries in 2015 were China, 41%; the

United States, 15%; the Republic of Korea, 5%; India, 5%; and Germany, 3% (International Lead and Zinc Study Group, 2016c, p. 10–11).

The 2015 average annual London Metal Exchange Ltd. (LME) cash price for lead was \$0.81 per pound, a 15% decrease from that of 2014. The Platts Metals Week North American Market price was \$0.91 per pound, 14% less than that in 2014.

## Legislation and Government Programs

In late 2013, California Assembly Bill 711 was signed into law requiring the use of nonlead ammunition when taking any wildlife with a firearm in California. The law required that the California Fish and Game Commission adopt regulations to phase in the statute's requirements by July 1, 2015, with full implementation by July 1, 2019. In April 2015, the Fish and Game Commission adopted proposed regulations from the California Department of Fish and Wildlife (CDFW) to implement the nonlead requirement in three phases: phase one, effective July 1, 2015, required nonlead ammunition when taking Nelson bighorn sheep and all wildlife on CDFW wildlife areas and ecological reserves; phase two, effective July 1, 2016, would require nonlead shot when taking most upland game birds with a shotgun; and phase three, effective July 1, 2019, would require nonlead shot when taking any wildlife with a firearm anywhere in California (California Department of Fish and Wildlife, undated).

## Production

**Mine.**—In 2015, domestic mine production of recoverable lead was 360,000 t, slightly less than that in 2014 (table 1), and about 23% less than production in 2000. There were 10 lead-producing mines operating in the United States in 2015 (table 2) compared with 19 mines in 2000.

Alaska and Missouri accounted for most of the U.S. mine output of lead. Lead was also mined in Idaho and Washington. Domestic mine production data were collected by the U.S. Geological Survey (USGS) from a voluntary survey of lode-mines. Eight lead-producing mines responded to the survey in 2015, accounting for about 90% of the U.S. production reported. Production data for nonreporting mines were estimated from publicly available data.

The Doe Run Company (St. Louis, MO) operated four mills that produced lead concentrates from ore supplied from six underground mines along the Viburnum Trend in southeast Missouri. The company did not publicly disclose annual lead production data but reported that it generally produces about 230,000 metric tons per year (t/yr) of lead in concentrate. All of the concentrates produced at the mines were exported (Doe Run Company, The, 2016, p. 1, 6, 36).

Teck Alaska Inc. (a wholly owned subsidiary of Teck Resources Ltd., Canada) operated the Red Dog zinc-lead mine in northwestern Alaska under a royalty agreement with NANA Regional Corp., the sole owner of the property. NANA is an Alaska Native-owned corporation organized under the provisions of the Alaska Native Claims Settlement Act. During 2015, Teck reported that production of lead in concentrates at Red Dog decreased by 4% to about 118,000 t from 123,000 t in 2014 owing to declines in mill recovery rates and throughput. Teck expected that lead production would be between 115,000 and 120,000 t in 2016. Teck reported that proven and probable ore reserves at yearend 2015 totaled 56.6 Mt grading 4.1% lead (Teck Resources Ltd., 2016a, p. 20; 2016b, p. 46).

In December 2014, Teck restarted its Pend Oreille zinc-lead mine in northeastern Washington State and produced 6,600 t of lead in 2015. The mine was placed on care-and-maintenance status in February 2009 owing to low zinc prices. By yearend 2015, Pend Oreille was producing at 90% of designed mill throughput of 2,000 metric tons per day (t/d). Teck reported that proven and probable ore reserves at yearend 2015 totaled 2.80 Mt grading 1.1% lead, and the expected life of the mine was about 4½ years (Teck Cominco Ltd., 2009, p. 23; Teck Resources Ltd., 2016a, p. 20; 2016b, p. 45; 2016c, p. 38).

Hecla Mining Co. (Coeur d'Alene, ID) operated the Greens Creek gold, lead, silver, and zinc mine near Juneau, AK, and the Lucky Friday lead, silver, and zinc mine in the Coeur d'Alene mining district in northern Idaho. In 2015, Hecla produced 19,600 t of lead in concentrates at Greens Creek, 7% more than that in 2014. Hecla reported that proven and probable reserves at yearend 2015 totaled 198,000 t of lead, and the company estimated that the remaining mine life was 10 years. In 2015, Lucky Friday produced 16,600 t of lead in concentrates, 9% less than the amount that was produced in 2014 owing to temporary shutdowns at the mine for mechanical issues. Hecla reported that proven and probable lead reserves at yearend 2015 totaled 426,000 t of lead, and the estimated remaining mine life at Lucky Friday was 21 years (Hecla Mining Co., 2016, p. 14–18).

**Primary Refined.**—There was no primary refined lead production in 2015. Doe Run closed the only domestic primary lead smelter in Herculaneum, MO, at yearend 2013.

**Secondary Refined.**—Domestic production of secondary refined lead in 2015 increased slightly to 1.05 Mt from 1.02 Mt in 2014. The domestic secondary lead industry consisted of several vertically integrated battery producers that operated secondary lead smelters to supply lead for their lead-acid battery plants and several companies that operated stand-alone secondary smelters. The latter typically had tolling agreements with battery manufacturers to recycle their used lead-acid batteries and supply them with secondary lead. Lead-acid batteries continued to be the dominant source of recoverable lead scrap, accounting for 94% of all secondary lead (table 3). The domestic secondary lead data were derived by the USGS from monthly and annual surveys of secondary producers. In 2015, 11 companies that produced secondary lead, exclusive of that recovered in copper-base scrap, were surveyed; 10 responded, representing about 99% of the total production of secondary lead. Production for the nonrespondent was estimated from prior-years' production. Of the total lead recycled

in 2015, the majority was recovered by seven companies operating 11 plants in Alabama, California, Florida, Indiana, Minnesota, Missouri, New York, Pennsylvania, Tennessee, and Texas (tables 1, 3).

In April 2013, the California Department of Toxic Substances Control (DTSC) directed Exide Technologies Inc. (Milton, GA) to temporarily suspend recycling operations at its Vernon, CA, secondary lead refinery owing to issues related to its stormwater piping system and excessive lead emissions from the furnace. In July 2013, the company successfully challenged the temporary suspension in court and received permission to resume operations. In October 2013, however, the South Coast Air Quality Monitoring District (SCAQMD) filed a petition seeking the suspension of operations at the Vernon refinery for alleged violations of an SCAQMD rule and related furnace control equipment permit conditions. In April 2014, SCAQMD filed a second petition seeking an order that Exide “cease and desist” operations owing to violations of the SCAQMD ambient air standard for lead. In response, Exide suspended operations at the refinery until it could design, engineer, permit, install, and test new equipment needed to operate in compliance with air quality standards. In early 2015, Exide announced that it would permanently close the refinery under the terms of a nonprosecution agreement reached with the U.S. Attorney's Office for the Central District of California (USAO) that resolved a USAO criminal investigation into Exide. Exide also entered into an amendment to a 2014 stipulation and order with the DTSC that provided a framework for the orderly closure and cleanup of the Vernon facility (Exide Technologies, Inc., 2014, p. 11–12, 32–33; 2015).

In March 2015, Aqua Metals Inc. (Oakland, CA) announced plans to build a new secondary lead refinery in McCarran, NV, that would be capable of producing high-purity lead for use in advanced lead-acid batteries. The plant would use an electrochemical battery recycling technology that differed from traditional smelting methods used by most existing secondary lead smelter-refineries. The company began construction in August and planned to have the facility in operation in the second quarter of 2016 (Aqua Metals Inc., 2015; MacAulay, 2015).

## Consumption

Reported U.S. consumption of refined lead increased by about 4% in 2015 from that of 2014 owing primarily to increases in lead used for sheet lead, storage batteries, and miscellaneous uses, partially offset by declines in use in ammunition, casting metals, and solder (table 4). Consumption of lead in SLI and industrial-type lead-acid storage batteries accounted for 86% of the total reported consumption of lead (tables 4, 5). Demand for lead was heavily reliant on the automotive sector. The Battery Council International (BCI) reported that 127 million lead-acid automotive batteries containing an estimated 1.25 Mt of lead (based on an average of 9.84 kilograms of lead content per battery) (SmithBucklin Statistics Group, 2014, p. 4) were shipped by North American producers in 2015, a slight increase from battery shipments (126 million batteries containing an estimated 1.24 Mt of lead) in 2014. Shipments of replacement lead-acid automotive batteries (106 million) were essentially unchanged for the second consecutive year,

but shipments of original equipment lead-acid automotive batteries (21.4 million) increased by 4% from those in 2014 (Battery Council International, 2016, p. 23–24).

## Prices and Stocks

In 2015, the average annual North American Market price and the LME cash price for lead declined by 14% and 15%, respectively, from those in 2014 (table 1). The average monthly LME cash price for lead was \$0.830 per pound in January and trended downward during the first quarter of the year before increasing to a peak of \$0.910 per pound in May. The average monthly lead price trended downward for the rest of the year, and was \$0.772 per pound in December. The decrease in the LME price during the year was partially attributed to subdued investor interest in metals and other commodities, the increased strength of the U.S. dollar relative to other currencies, the perception of excess lead metal supply, and a slowdown in economic growth in China (CRU International Ltd., 2016, p. 11–13).

Scrap prices were relatively stable during the first half of 2015 but declined during the last half of the year. According to Platts Metals Week, the average monthly price paid by domestic smelters for whole spent lead-acid batteries (the most prevalent form of lead scrap) decreased from \$0.345 per pound in January to \$0.280 per pound in December.

Global LME lead stocks at the end of December 2015 were 191,650 t, 14% less than those at the end of December 2014. Lead stocks in domestic LME-approved warehouses decreased to 300 t at yearend 2015 from 725 t at yearend 2014.

## Foreign Trade

In 2015, imports for consumption of unwrought (refined) lead metal in pigs and bars totaled 521,000 t, a 12% decrease from those of 2014. A decrease in imports from Kazakhstan of 36,900 t, Canada (14,900 t), and Russia (7,690 t) were partially offset by increases from the Republic of Korea (18,600 t), India (11,400 t), and other countries (15,900 t). The leading sources were Canada, accounting for 48% of unwrought lead metal imports, an increase from 45% in 2014, followed by Mexico (21%) and the Republic of Korea (11%) (table 10).

Imports of refined lead from the Republic of Korea increased substantially during the past 2 years. Cumulatively, less than 10,000 t of lead in pigs and bars was imported from the Republic of Korea from 1996 to 2013 compared with about 96,000 t imported since the beginning of 2014. Refined lead production and global exports from the Republic of Korea have increased since 2011, primarily owing to upgrades to Korea Zinc Co. Ltd.'s zinc-lead smelter in Onsan. The plant produced about 300,000 t of refined lead in 2015, compared with 200,000 t in 2010, and was expected to produce 360,000 t in 2016, making it one of the largest lead smelters in the world (CRU International Ltd., 2016, p. 92, C–12; International Lead and Zinc Study Group, 2016a, p. 32).

Total domestic exports of unwrought lead in 2015 were 55,900 t, essentially unchanged from those in 2014. Mexico and Belgium were the leading destinations for the unwrought lead exported in 2015, accounting for about 69% and 21%, respectively, of the total. Domestic exports of lead in

concentrates were 349,000 t, slightly less than those of 2014; China (59%), Canada (12%), and the Republic of Korea (10%) were the leading destinations (table 9). In 2014 and 2015, essentially all lead concentrates were exported following the yearend 2013 closure of Doe Run's Herculaneum primary smelter (table 9).

A substantial quantity of lead contained in new and spent lead-acid batteries is traded annually. U.S. Census Bureau trade data indicated that, in 2015, the United States imported about 17.3 million SLI lead-acid batteries for consumption, compared with 22.9 million in 2014. Mexico was the leading provider of SLI batteries, accounting for 31% of those imported in 2015. SLI batteries were also imported from China, Colombia, Germany, Japan, the Republic of Korea, the Philippines, Taiwan, and Vietnam. The United States exported about 25.9 million spent SLI lead-acid batteries in 2015, 14% less than in 2014. The majority of those batteries were shipped to Mexico (87%) and Canada (12%) for recycling. Much of the lead recovered from the exported spent batteries was used to manufacture lead-acid batteries at plants in Canada and Mexico that were exported to the United States.

## World Review

World mine production of lead decreased by 9% to 4.95 million metric tons (Mt) from 5.44 Mt in 2014 owing primarily to a 17% production decline in China, the leading global producer. The United States was the third-leading producer (unchanged from 2014) and accounted for about 7% of global lead mine production.

Globally, 185,000 t/yr of lead mine production capacity was closed in 2015 and about 30,000 t/yr of capacity opened. Most of the capacity shutdown was in Australia and, to a lesser extent, Canada, Ireland, and Mexico (International Lead and Zinc Study Group, 2016b, p. 5, 23). In early October, in response to low lead and zinc prices, Glencore plc (Switzerland) announced that it planned to reduce its mine production by 500,000 t/yr of zinc in concentrate and by 100,000 t/yr of lead in concentrate. The reductions in production would be spread across Glencore's mining operations in Australia, Kazakhstan, and South America. Lead is commonly produced as a coproduct with zinc mine production, and lead mine production can be affected by changes in the zinc market (Glencore plc, 2015).

World production of refined lead (primary and secondary) was 10.4 Mt, about 3% less than that in 2014. The United States was the second-leading global producer of refined lead after China and accounted for 10% of global production, the same as in 2014. China produced about 43% of global refined lead in 2015 (table 12). A significant decrease in refined lead production in China was partially offset by small increases in several lead-producing countries. Secondary lead production was about 56% of total world refined lead production in 2015, a slight increase from that in 2014. In 2015, three lead refineries opened—a 130,000-t/yr primary smelter in the Republic of Korea and smaller secondary plants in Honduras and Russia with a combined capacity of about 40,000 t/yr of refined lead (International Lead and Zinc Study Group, 2016b, p. 5–6, 23, 26).

According to the ILZSG, global consumption of refined lead in 2015 was 10.6 Mt, slightly less than that in 2014. The leading refined-lead-consuming countries in 2015 were China, 41%; the United States, 15%; the Republic of Korea, 5%; India, 5%; and Germany, 3% (International Lead and Zinc Study Group, 2016c, p. 10–11).

**Australia.**—In 2015, lead mine production in Australia decreased by about 10% as a result of reduced production at Ivernia Inc.'s (Canada) Paroo Station Mine (85,000-t/yr production capacity) in Western Australia. In January 2015, the mine was placed on care-and-maintenance status owing to market conditions, primarily the decline in lead prices. In 2014, the mine produced 80,900 t of lead in concentrates (Ivernia Inc., 2015a, p. 7; 2015b).

**Canada.**—In May, Trevali Mining Corp. announced the commissioning of the mill at its Caribou Zinc Mine in northern New Brunswick following the start of underground mining operations earlier in the year. The company expected that the mill could process 3,000 t/d of ore and produce about 14,000 t/yr of lead in concentrate at full capacity (International Lead and Zinc Study Group, 2016b, p. 22; Trevali Mining Corp., 2015).

**China.**—In 2015, China continued to be the leading global producer and consumer of lead and the leading producer of lead-acid batteries, although declines were reported for each compared with those in 2014. Refined lead production in 2015 decreased by 7% to 4.40 Mt from 4.74 Mt in 2014, the second consecutive annual decrease (table 12). The decline in primary refined lead production was attributed to less available production capacity in 2015 following plant shutdowns for maintenance or environmental reasons. The decline in secondary production was partially attributed to the reduction of a value-added tax rebate to 30% from 50% in July 2015 that increased the tax burden on secondary lead producers and resulted in some producers cutting back production during the second half of 2015. Lead in concentrate production in 2015 was about 2.40 Mt, a 17% decrease from the 2.90 Mt produced in 2014 and an 18% decrease from production in 2013 (table 11). The decrease in mine production was attributed to price-induced production cutbacks and an increase in environmental regulations for mines by Provincial governments (Beijing Antaika Information Development Co., Ltd., 2016, p. 6, 8–9).

According to the ILZSG, consumption of lead in China decreased by 6% to 4.41 Mt in 2015 from 4.71 Mt in 2014. The decline in domestic lead consumption was attributed to a slowdown in sales of electric bikes in 2015, as was the case in 2014, which accounted for about 30% of annual lead consumption (International Lead and Zinc Study Group, 2015; 2016a, p. 26).

## Outlook

Lead mine production in the United States was expected to decline in 2016. In late January, Doe Run announced that it was reducing production at its mines in southeastern Missouri in 2016 by about 18,100 t/yr of lead in concentrate, equivalent to 10% of the company's annual production. Copper and zinc production would also be reduced. Price declines for metals and increased operational and regulatory costs were cited as the reasons for the cutbacks (Doe Run Company, The, 2016).

At its October 2015 meeting in Lisbon, Portugal, the ILZSG forecast global increases in lead consumption and refined and mine production in 2016. Global lead consumption in 2016 is expected to increase slightly, primarily owing to increased consumption in China, Europe, and the United States. China's consumption is expected to increase owing to increased use of lead-acid batteries for automobiles and industrial applications, partially offset by declines in use for electric bicycles. Global lead mine production in 2016 is forecast to increase slightly from that in 2015 owing to increased mine production in China, Mexico, and Russia that will be partially offset by declines in Australia and Ireland. Global refined lead production is forecast to increase by about 4% in 2016 owing to increases in Belgium, China, India, Italy, and the Republic of Korea. ILZSG forecast that global refined lead consumption would exceed production by about 97,000 t in 2016 (International Lead and Zinc Study Group, 2015).

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## GENERAL SOURCES OF INFORMATION

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TABLE 1  
SALIENT LEAD STATISTICS<sup>1</sup>

		2011	2012	2013	2014	2015
United States:						
Production:						
Mine, recoverable lead content: <sup>2</sup>						
Quantity	metric tons	334,000	336,000	331,000	367,000	360,000
Value	thousands	\$895,000	\$845,000	\$837,000	\$860,000	\$724,000
Primary lead, refined content, domestic ores and base bullion	metric tons	118,000	111,000	114,000	--	--
Secondary lead, lead content	do.	1,130,000	1,110,000	1,150,000	1,020,000	1,050,000
Exports, lead content:						
Lead ore and concentrates	do.	218,000	211,000	215,000	356,000	349,000
Lead materials, excluding scrap	do.	47,200	53,400	48,500	61,300	59,400
Imports for consumption, lead content:						
Lead in base bullion	do.	434	1,020	1,900	1,080	321
Lead in pigs and bars	do.	313,000	349,000	500,000	593,000	521,000
Stocks, December 31, lead content:						
Primary lead	do.	W	W	W	W	W
At consumers and secondary smelters	do.	48,300	71,700	69,900	66,400 <sup>r</sup>	48,900
Consumption of metal, primary and secondary, lead content	do.	1,410,000	1,350,000	1,390,000	1,510,000 <sup>r</sup>	1,560,000
Price: <sup>3</sup>						
North American Market price	cents per pound	NA	NA	109.98	106.17	91.20
North American Producer price	do.	121.70	114.16	NA	NA	NA
London Metal Exchange, pure lead, cash average	do.	108.92	93.53	97.15	95.04	81.02
World:						
Production, lead content:						
Mine	metric tons	4,750,000	5,080,000 <sup>r</sup>	5,430,000 <sup>r</sup>	5,440,000 <sup>r</sup>	4,950,000 <sup>e</sup>
Refinery:						
Primary	do.	4,600,000 <sup>r</sup>	4,710,000 <sup>r</sup>	4,700,000	4,460,000 <sup>r</sup>	4,220,000 <sup>e</sup>
Secondary	do.	5,400,000	5,420,000 <sup>r</sup>	5,610,000 <sup>r</sup>	5,810,000 <sup>r</sup>	5,800,000 <sup>e</sup>
Undifferentiated	do.	292,000	262,000	350,000	375,000	333,000 <sup>e</sup>

<sup>e</sup>Estimated. <sup>r</sup>Revised. do. Ditto. NA Not available. W Withheld to avoid disclosing company proprietary data. -- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits, except prices.

<sup>2</sup>Lead recoverable after smelting and refining. Data in table 11 represent lead in concentrate.

<sup>3</sup>Source: Platts Metals Week.

TABLE 2  
LEADING LEAD-PRODUCING MINES IN THE UNITED STATES IN 2015, IN ORDER OF OUTPUT<sup>1</sup>

Rank	Mine	County and State <sup>2</sup>	Operator	Source of lead
1	Red Dog	Northern Region, AK	Teck Alaska Inc.	Zinc-lead ore.
2	Fletcher	Reynolds, MO	Doe Run Resources Corp.	Lead ore.
3	Brushy Creek	do.	do.	Do.
4	Viburnum (#29 and #35)	Washington and Iron, MO	do.	Do.
5	Buick	Iron, MO	do.	Do.
6	Sweetwater	Reynolds, MO	do.	Do.
7	Lucky Friday	Shoshone, ID	Hecla Mining Co.	Silver ore.
8	Greens Creek	Southeastern Region, AK	do.	Zinc-silver ore.
9	Galena	Shoshone, ID	U.S. Silver & Gold Inc.	Silver ore.
10	Pend Oreille	Pend Oreille, WA	Teck American Inc.	Zinc-lead ore.

Do., do. Ditto.

<sup>1</sup>The mines on this list accounted for 100% of the U.S. lead mine production in 2015.

<sup>2</sup>For Alaska, mines are located by geographic region, as delineated by the Alaska Division of Geological & Geophysical Surveys in its Special Report 67, Alaska's mineral industry 2011—Exploration activity.

TABLE 3  
LEAD RECOVERED FROM SCRAP PROCESSED IN THE UNITED STATES BY KIND OF SCRAP AND FORM OF RECOVERY<sup>1</sup>

(Metric tons, lead content, unless otherwise specified)

	2014	2015
Kind of scrap:		
New scrap:		
Lead-base	16,900	17,700
Tin-base	1,530	1,530
Total	18,400	19,300
Old scrap:		
Battery-lead	961,000	991,000
All other lead-base	39,500	41,100
Total	1,000,000	1,030,000
Grand total	1,020,000	1,050,000
Form of recovery:		
As soft lead	786,000	827,000
In antimonial lead	224,000	222,000
In other lead alloys	8,830	2,590
Total:		
Quantity	1,020,000	1,050,000
Value <sup>2</sup> thousands	\$2,640,000	\$2,110,000

-- Zero.

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

<sup>2</sup>Value based on average quoted price of common lead.



TABLE 4  
U.S. CONSUMPTION OF LEAD, BY PRODUCT<sup>1</sup>

(Metric tons, lead content)

SIC <sup>2</sup> code	Product	2014	2015
	Metal products:		
3482	Ammunition, shot and bullets	85,300	79,300
	Bearing metals:		
35	Machinery except electrical	W	W
371	Motor vehicles and equipment	W	W
37	Other transportation equipment	W	W
	Total	1,150	1,080
3351	Brass and bronze, billets and ingots	2,990	2,080
36	Cable covering, power and communication	(3)	(3)
15	Calking lead, building construction	(3)	(3)
	Casting metals:		
371	Motor vehicles and equipment	W	W
37	Other transportation equipment	W	W
3443	Nuclear radiation shielding	W	W
	Total	19,100	14,300
	Pipes, traps, other extruded products:		
15	Building construction	W	W
3443	Storage tanks, process vessels, etc.	W	W
	Total	6,900	7,460
	Sheet lead:		
15	Building construction	W	W
3443	Storage tanks, process vessels, etc.	W	W
3693	Medical radiation shielding	W	3,880
	Total	6,090	12,200
	Solder:		
15	Building construction	42	45
367	Electronic components, accessories and other electrical equipment	W	W
371	Motor vehicles and equipment	W	W
	Total	7,380	6,500
	Storage batteries:		
3691	Storage battery grids, post, etc.	564,000 <sup>†</sup>	713,000
3691	Storage battery oxides	751,000 <sup>†</sup>	640,000
	Total	1,320,000 <sup>†</sup>	1,350,000
27	Type metal, printing and allied industries	(4)	(4)
34	Other metal products <sup>5</sup>	33,000 <sup>†</sup>	33,200
	Total, metal products	1,480,000 <sup>†</sup>	1,510,000
	Other oxides:		
285	Paint	W	W
32	Glass and ceramics products	W	W
28	Other pigments and chemicals	W	W
	Total	9,740	11,500
	Miscellaneous uses	20,000 <sup>†</sup>	44,300
	Grand total	1,510,000 <sup>†</sup>	1,560,000

<sup>†</sup>Revised. W Withheld to avoid disclosing company proprietary data; included in appropriate totals.

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

<sup>2</sup>Standard Industrial Classification.

<sup>3</sup>Withheld to avoid disclosing company proprietary data; included in "Total, metal products."

<sup>4</sup>Withheld to avoid disclosing company proprietary data; included in "Other metal products."

<sup>5</sup>Includes lead consumed in foil, collapsible tubes, annealing, galvanizing, plating, electrowinning, fishing weights, and terne metal.

TABLE 5  
U.S. CONSUMPTION OF LEAD IN 2015, BY CLASS OF PRODUCT<sup>1,2</sup>

(Metric tons, lead content)

Product	Refined soft lead	Lead in antimonial lead	Lead in alloys	Lead in copper-base scrap	Total
Metal products	63,500	80,800	W	W	156,000
Storage batteries	783,000	315,000	254,000	--	1,350,000
Miscellaneous <sup>3</sup>	46,900	W	W	--	55,800
Total	893,000	W	268,000	W	1,560,000

W Withheld to avoid disclosing company proprietary data; included in "Total." -- Zero.

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

<sup>2</sup>Includes lead that went directly from scrap to fabricated products.

<sup>3</sup>Includes other oxides and gasoline additives.

TABLE 6  
STOCKS OF LEAD AT CONSUMERS AND SECONDARY SMELTERS IN THE UNITED STATES, DECEMBER 31<sup>1,2</sup>

(Metric tons, lead content)

Year	Refined soft lead	Lead in antimonial lead	Lead in alloys	Lead in copper-base scrap	Total
2014	43,400	20,200	2,870 <sup>†</sup>	W	66,400 <sup>†</sup>
2015	32,600	13,500	2,810	W	48,900

<sup>†</sup>Revised. W Withheld to avoid disclosing company proprietary data; included in "Lead in alloys."

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

<sup>2</sup>Includes stocks at primary refineries.

TABLE 7  
PRODUCTION AND SHIPMENTS OF LEAD PIGMENTS AND OXIDES IN THE UNITED STATES<sup>1,2</sup>

(Metric tons and dollars)

Product	2014				2015			
	Production		Shipments <sup>e</sup>		Production		Shipments <sup>e</sup>	
	Gross weight	Lead content	Quantity (lead content)	Value <sup>3</sup>	Gross weight	Lead content	Quantity (lead content)	Value <sup>3</sup>
Litharge, red lead and white lead, dry	23,900	21,900	23,900	55,900,000	3,900	3,610	3,900	8,770,000
Lead oxide	728,000 <sup>†</sup>	691,000 <sup>†</sup>	NA	NA	610,000	580,000	NA	NA
Total	752,000 <sup>†</sup>	713,000 <sup>†</sup>	NA	NA	614,000	584,000	NA	NA

<sup>e</sup>Estimated. <sup>†</sup>Revised. NA Not available.

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

<sup>2</sup>Excludes basic lead sulfate to avoid disclosing company proprietary data.

<sup>3</sup>At plant, exclusive of container.

TABLE 8  
U.S. IMPORTS FOR CONSUMPTION OF LEAD PIGMENTS AND COMPOUNDS, BY KIND<sup>1</sup>

Kind	Quantity (metric tons, lead content)	Value (thousands)
2014:		
Chrome yellow, molybdenum orange pigments, lead-zinc chromates	967	\$6,530
Litharge	1,820	4,300
Glass frits (undifferentiated)	31,900	56,100
Total	34,600	66,900
2015:		
Chrome yellow, molybdenum orange pigments, lead-zinc chromates	1,250	5,710
Litharge	1,390	3,670
Glass frits (undifferentiated)	37,800	62,300
Total	40,400	71,700

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

Source: U.S. Census Bureau.

TABLE 9  
U.S. EXPORTS OF LEAD, BY COUNTRY<sup>1</sup>

Country	2014		2015	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
<b>Ore and concentrates, lead content:</b>				
Belgium	7,740	\$14,000	20,100	\$29,400
Canada	29,200	51,800	40,600	58,300
China	257,000	410,000	206,000	268,000
France	84	26	--	--
Germany	15,700	26,900	15,700	21,800
Italy	7,890	13,800	15,900	21,700
Japan	13,500	24,300	15,400	20,300
Korea, Republic of	23,900	40,300	34,200	45,700
Mexico	490	1,030	1,050	1,320
Other	29	10	260	93
Total	356,000	582,000	349,000	467,000
<b>Base bullion, lead content:</b>				
Canada	963	2,820	596	1,470
Other	1	11	--	--
Total	964	2,830	596	1,470
<b>Unwrought lead and lead alloys, lead content:</b>				
Belgium	11,200	9,880	12,000	12,000
Canada	638	921	1,160	1,600
China	--	--	54	41
Ecuador	18	13	--	--
Japan	266	162	2,150	1,310
Korea, Republic of	122	160	13	8
Malaysia	1,720	3,420	--	--
Mexico	39,700	46,000	38,600	37,200
Netherlands	71	134	50	273
Russia	6	3	--	--
United Kingdom	104	125	27	25
Venezuela	1,260	2,680	--	--
Other	222	289	1,930	1,540
Total	55,300	63,800	55,900	54,000
<b>Wrought lead and lead alloys, lead content:</b>				
Canada	1,790	3,200	674	2,400
Chile	36	92	1	31
China	24	131	34	290
Colombia	23	43	--	--
India	1,460	2,330	916	1,340
Korea, Republic of	25	119	35	208
Mexico	455	738	217	833
Singapore	477	712	128	1,120
United Kingdom	201	405	100	554
Other	536	2,310	771	3,290
Total	5,020	10,100	2,880	10,100
<b>Scrap, gross weight:</b>				
Canada	4,120	6,700	3,770	6,410
China	805	752	2,840	2,190
Dominican Republic	1,200	360	1,490	578
Ecuador	7,590	12,300	8,890	12,600
India	8,550	12,800	6,710	10,200
Ireland	94	170	57	91
Korea, Republic of	10,700	13,700	18,600	21,500
United Arab Emirates	720	1,520	2,510	2,430
Other	2,590	3,000	1,360	998
Total	36,400	51,300	46,200	57,000

-- Zero.

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

Source: U.S. Census Bureau.

TABLE 10  
U.S. IMPORTS FOR CONSUMPTION OF LEAD, BY COUNTRY<sup>1</sup>

Country	2014		2015	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
<b>Base bullion:</b>				
Canada	45	\$289	--	--
Mexico	487	560	182	\$212
Panama	425	850	--	--
Senegal	--	--	94	211
Venezuela	124	200	45	70
Total	1,080	1,900	321	493
<b>Pigs and bars, lead content:</b>				
Australia	787	1,850	4,720	9,270
Belgium	347	703	--	--
Canada	264,000	605,000	249,000	499,000
Chile	3,140	6,360	981	1,550
China	59	243	1,230	542
Dominican Republic	438	948	50	102
Ecuador	8,840	19,300	12,300	23,700
France	1,560	3,690	79	253
India	10,300	23,100	21,700	43,000
Israel	3,020	6,750	1,180	2,370
Italy	822	1,660	--	--
Kazakhstan	59,700	134,000	22,900	57,700
Korea, Republic of	38,600	85,700	57,200	111,000
Mexico	120,000	158,000	111,000	154,000
Panama	796	1,560	842	1,530
Peru	49,700	106,000	--	--
Russia	18,400	39,900	10,700	21,000
Spain	5,420	11,000	1,620	3,580
Sri Lanka	740	1,710	1,290	2,690
United Kingdom	3,670	8,940	2,560	5,400
Venezuela	917	1,550	3,910	7,070
Other	1,690	3,480	17,600	33,900
Total	593,000	1,220,000	521,000	979,000
<b>Reclaimed scrap, including ash and residues, lead content:</b>				
Canada	4,760	4,960	2,830	1,080
Colombia	152	308	49	151
Dominican Republic	1,350	2,600	793	1,310
Honduras	742	1,990	--	--
Mexico	1,920	1,530	1,820	1,230
Venezuela	869	1,800	--	--
Other	1,610	2,060	1,950	2,550
Total	11,400	15,200	7,450	6,320
<b>Wrought lead, all forms, including wire and powders, gross weight:</b>				
Argentina	60	132	48	125
Canada	28	191	42	210
Germany	495	3,170	481	2,690
India	117	284	60	196
Japan	2	13	--	--
Sweden	18	293	14	278
United Kingdom	795	2,200	844	2,390
Other	82	398	174	539
Total	1,600	6,680	1,660	6,420

-- Zero.

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

Source: U.S. Census Bureau.

TABLE 11  
LEAD: WORLD MINE PRODUCTION OF LEAD IN CONCENTRATE, BY COUNTRY<sup>1,2</sup>

(Metric tons, lead content)

Country <sup>3</sup>	2011	2012	2013	2014	2015 <sup>e</sup>
Argentina <sup>e</sup>	26,074 <sup>4</sup>	26,475 <sup>4</sup>	26,000	29,000	26,000
Australia <sup>e</sup>	621,000 <sup>4</sup>	622,000	711,000	728,000	652,000
Bolivia	100,051	79,044	82,000	94,000	82,000
Bosnia and Herzegovina <sup>e</sup>	4,000	4,000	4,400	4,000	5,000
Brazil <sup>e</sup>	15,100 <sup>4</sup>	16,953 <sup>4</sup>	17,000	12,000	9,000
Bulgaria	10,121	14,366	15,986	17,000 <sup>e</sup>	17,000
Burma <sup>e</sup>	8,700	9,800 <sup>4</sup>	11,700	18,000	12,000
Canada	67,505	61,224	20,188	4,000	4,000
Chile	841	410	1,000	2,000	2,000
China <sup>e</sup>	2,400,000	2,610,000 <sup>r</sup>	2,850,000 <sup>r</sup>	2,800,000 <sup>r</sup>	2,335,000 <sup>4</sup>
Greece	16,592	18,062	18,000	11,000 <sup>e</sup>	10,000
Honduras <sup>e</sup>	16,954 <sup>4</sup>	12,400 <sup>4</sup>	11,600	16,000	10,000
India	88,000	103,000	106,000	106,000 <sup>e</sup>	136,000
Iran <sup>e,5</sup>	40,000 <sup>4</sup>	35,000	42,000	36,000	41,000
Ireland	50,700	51,000	51,000 <sup>e</sup>	41,000	33,000
Italy <sup>e</sup>	800	--	--	--	--
Kazakhstan <sup>e</sup>	38,800 <sup>4</sup>	38,100 <sup>4</sup>	38,000	38,000	41,000
Korea, North <sup>e</sup>	32,000	38,000	30,000 <sup>r</sup>	30,000 <sup>r</sup>	35,000
Korea, Republic of	1,289	1,434	1,500	1,500 <sup>e</sup>	1,500
Macedonia	37,000	36,000	36,000	38,000	33,000
Mexico	223,717	210,382	210,000	250,000	254,000
Morocco <sup>e</sup>	43,800 <sup>4</sup>	39,100 <sup>4</sup>	40,000	28,000	29,000
Namibia <sup>e</sup>	9,139 <sup>4</sup>	9,000	11,000	12,000	9,000
Peru	230,199	249,236	266,472	278,000	316,000
Poland	53,100	56,600	51,710	45,000 <sup>r</sup>	37,000
Russia, recoverable <sup>e</sup>	94,500	195,600 <sup>r,4</sup>	223,300 <sup>r,4</sup>	225,000 <sup>r</sup>	225,000
South Africa <sup>e</sup>	54,460 <sup>4</sup>	52,489 <sup>4</sup>	53,000	29,000	41,000
Spain <sup>e</sup>	7,813 <sup>4</sup>	3,763 <sup>4</sup>	6,000	7,000	10,000
Sweden	61,999	63,551	59,556	71,000	76,000
Tajikistan <sup>e</sup>	10,000	15,000	19,000	22,000	28,000
Turkey, Pb content of Pb-Zn ore <sup>e</sup>	40,000	56,000	78,000 <sup>4</sup>	65,400	74,000
United Kingdom	-- <sup>r</sup>	-- <sup>r</sup>	-- <sup>r</sup>	-- <sup>r</sup>	--
United States	342,000	345,000	340,000	379,000	367,000 <sup>4</sup>
Vietnam <sup>e</sup>	6,400	6,300	1,900	2,800	2,000
Total	4,750,000	5,080,000 <sup>r</sup>	5,430,000 <sup>r</sup>	5,440,000 <sup>r</sup>	4,950,000

<sup>e</sup>Estimated. <sup>r</sup>Revised. -- Zero.

<sup>1</sup>Totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Includes data available through February 14, 2017.

<sup>3</sup>In addition to the countries listed, Nigeria, Serbia, and Uzbekistan may have produced lead, but available information was inadequate to make reliable estimates of output.

<sup>4</sup>Reported figure.

<sup>5</sup>Year beginning March 21 of that stated.

TABLE 12  
LEAD: WORLD REFINERY PRODUCTION, BY COUNTRY<sup>1, 2</sup>

(Metric tons)

Country <sup>3</sup>	2011	2012	2013	2014	2015 <sup>c</sup>
<b>Argentina:<sup>c</sup></b>					
Primary	11,859 <sup>4</sup>	16,445 <sup>4</sup>	13,800	12,000	8,000
Secondary	72,700	73,820 <sup>4</sup>	69,900	28,000	33,000
Total	84,600	90,265 <sup>4</sup>	83,700	40,000	41,000
<b>Australia:<sup>c</sup></b>					
Primary	187,000 <sup>4</sup>	160,000 <sup>4</sup>	177,000 <sup>4</sup>	176,000 <sup>4</sup>	182,000
Secondary	26,000	24,000	24,000	50,000	41,000
Total	213,000	184,000	201,000	226,000	223,000
Austria, secondary <sup>c</sup>	26,208 <sup>4</sup>	24,504 <sup>4</sup>	38,800	37,100	24,000
Belgium, secondary <sup>c</sup>	88,129 <sup>4</sup>	87,958 <sup>4</sup>	87,900	127,000	130,000
Bolivia, primary <sup>c</sup>	269 <sup>4</sup>	250	330	2,000	--
Brazil, secondary	138,537	165,397	165,400	190,000 <sup>c</sup>	190,000
Bulgaria, primary and secondary	90,933	86,156	90,742	92,000 <sup>c</sup>	90,000
Burma, primary <sup>c</sup>	2,000 <sup>r</sup>	2,000 <sup>r</sup>	2,000 <sup>r</sup>	2,000 <sup>r</sup>	2,000
<b>Canada:</b>					
Primary	112,531	133,495	128,706	131,000	128,000
Secondary	170,059	144,570	159,595	151,000	145,000
Total	282,590	278,065	288,301	282,000	273,000
<b>China:<sup>c</sup></b>					
Primary	3,200,000	3,220,000 <sup>r</sup>	3,280,000	3,140,000 <sup>r</sup>	2,850,000
Secondary	1,400,000	1,370,000 <sup>r</sup>	1,500,000	1,600,000 <sup>r</sup>	1,550,000
Total	4,600,000	4,590,000 <sup>r</sup>	4,780,000	4,740,000	4,400,000
Czech Republic, secondary <sup>c</sup>	32,000	30,000	28,000	44,000	44,000
Estonia, secondary	7,840	8,046	7,100	7,400 <sup>c</sup>	12,000
France, secondary <sup>c</sup>	80,000	83,000	71,000	72,000	72,000
<b>Germany:</b>					
Primary	136,000	140,000 <sup>c</sup>	151,000	131,000	130,000
Secondary	293,000	290,000 <sup>c</sup>	249,000	248,000	248,000
Total	429,000	430,000 <sup>c</sup>	400,000	379,000	378,000
<b>India:</b>					
Primary	72,000	110,000	116,000	120,000	143,000
Secondary	347,000	350,000	355,000	357,000	358,000
Total	419,000	460,000	471,000	477,000	501,000
Indonesia, secondary <sup>c</sup>	47,000	45,000	42,000	46,000	46,000
<b>Iran:<sup>c</sup></b>					
Primary	25,000	25,000	20,000	23,000	16,000
Secondary	57,000	56,000	56,000	47,000	60,000
Total	82,000	81,000	76,000	70,000	76,000
Ireland, secondary <sup>c</sup>	20,000	20,000	20,000	17,000	17,000
Israel, secondary <sup>c</sup>	27,000	21,791 <sup>4</sup>	22,418 <sup>4</sup>	25,000	25,000
<b>Italy:</b>					
Primary	--	--	30,000	50,000	50,000
Secondary	149,500	138,400	150,000	160,000	158,000
Total	149,500	138,400	180,000	210,000	208,000
<b>Japan:<sup>c</sup></b>					
Primary	100,078 <sup>4</sup>	91,037 <sup>4</sup>	95,000	87,000	85,000
Secondary	117,937 <sup>4</sup>	117,957 <sup>4</sup>	115,000	153,000	147,000
Total	218,015 <sup>4</sup>	208,994 <sup>4</sup>	210,000	240,000	232,000
Kazakhstan, primary and secondary <sup>c</sup>	111,249 <sup>4</sup>	88,099 <sup>4</sup>	90,000	126,000	126,000
Kenya, secondary <sup>c</sup>	250	250	250	250	250
Korea, North, primary and secondary <sup>c</sup>	3,000	3,000	3,000	3,000	3,000
<b>Korea, Republic of:</b>					
Primary	256,851	280,000	227,700	299,000 <sup>c</sup>	291,000
Secondary	160,000	180,000	200,000	340,000 <sup>c</sup>	350,000
Total	416,851	460,000	427,700	639,000 <sup>c</sup>	641,000

See footnotes at end of table.

TABLE 12—Continued  
LEAD: WORLD REFINERY PRODUCTION, BY COUNTRY<sup>1, 2</sup>

(Metric tons)

Country <sup>3</sup>	2011	2012	2013	2014	2015 <sup>c</sup>
Mexico: <sup>c</sup>					
Primary <sup>5</sup>	101,729 <sup>4</sup>	112,431 <sup>4</sup>	100,000	119,000	116,000
Secondary	216,000	303,000	300,000	245,000 <sup>r</sup>	240,000
Total	318,000	415,000	400,000	364,000 <sup>r</sup>	356,000
Morocco: <sup>c</sup>					
Primary	36,469 <sup>4</sup>	38,000 <sup>4</sup>	--	--	--
Secondary	3,000	2,500	14,000 <sup>r</sup>	15,000 <sup>r</sup>	14,000
Total	39,500	40,500	14,000 <sup>r</sup>	15,000 <sup>r</sup>	14,000
Mozambique, secondary	--	892	1,704	1,700 <sup>c</sup>	1,700
Netherlands, secondary <sup>c</sup>	17,000	17,000	17,000	31,000	32,000
New Zealand, secondary <sup>c</sup>	9,000	9,000	9,000	--	--
Pakistan, secondary <sup>c, 6</sup>	919 <sup>4</sup>	2,900 <sup>4</sup>	2,000	9,000 <sup>r</sup>	9,000
Peru	--	--	81,000	46,000	--
Philippines, secondary	34,000	32,000	32,000	30,000	30,000
Poland:					
Primary	47,000	47,000	39,000	36,000 <sup>c</sup>	39,000
Secondary	87,000	87,000	103,000	112,000 <sup>c</sup>	114,000
Total	134,000	134,000	142,000	148,000 <sup>c</sup>	153,000
Portugal, secondary	6,000	5,000	4,000	5,000 <sup>c</sup>	5,000
Romania: <sup>c</sup>					
Primary	11,000 <sup>4</sup>	6,500 <sup>4</sup>	--	--	--
Secondary	3,000	3,000	3,000	12,000	13,000
Total	14,000	9,500	3,000	12,000	13,000
Russia, primary and secondary <sup>c</sup>	86,700	85,100	85,000	108,000	114,000
Slovenia, secondary <sup>c</sup>	15,000	14,000	12,000	11,000	12,000
South Africa, secondary <sup>c</sup>	56,000 <sup>4</sup>	54,000 <sup>4</sup>	54,000	52,000	52,000
Spain, secondary <sup>c</sup>	177,000	160,000	157,000	166,000	172,000
Sweden: <sup>c</sup>					
Primary	52,400	62,000	69,000	25,000	26,000
Secondary	41,000	44,000	45,000	44,000	45,000
Total	93,400	106,000	114,000	69,000	71,000
Switzerland, secondary <sup>c</sup>	3,000	2,500	--	--	--
Taiwan, secondary <sup>c</sup>	35,000	35,000	35,000	34,000	30,000
Thailand, secondary	93,000	87,000	87,400	79,300	86,000
Turkey, secondary <sup>c</sup>	48,000	50,000	50,000	55,000	56,000
Uganda, secondary <sup>c</sup>	800	800	800	800	800
Ukraine, secondary <sup>c</sup>	13,500	13,700	14,000	32,000	30,000
United Kingdom: <sup>c</sup>					
Primary <sup>7</sup>	125,000	157,000	137,000	110,000	150,000
Secondary <sup>8</sup>	144,000	155,000	155,000	157,000	158,000
Total	269,000	312,000	292,000	267,000	308,000
United States:					
Primary	118,000	111,000	114,000	--	-- <sup>4</sup>
Secondary	1,130,000	1,110,000	1,150,000	1,020,000	1,050,000 <sup>4</sup>
Total	1,250,000	1,220,000	1,260,000	1,020,000	1,050,000 <sup>4</sup>
Grand total	10,300,000	10,400,000 <sup>r</sup>	10,700,000 <sup>r</sup>	10,600,000	10,400,000
Of which:					
Primary	4,600,000 <sup>r</sup>	4,710,000 <sup>r</sup>	4,700,000	4,460,000 <sup>r</sup>	4,220,000
Secondary	5,400,000	5,420,000 <sup>r</sup>	5,610,000 <sup>r</sup>	5,810,000 <sup>r</sup>	5,800,000
Undifferentiated	292,000	262,000	350,000	375,000	333,000

<sup>c</sup>Estimated. <sup>r</sup>Revised. -- Zero.

<sup>1</sup>Grand totals, U.S. data, and estimated data are rounded to more than three significant digits; may not add to totals shown.

<sup>2</sup>Includes data available through February 14, 2017. 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.



TABLE 12—Continued  
LEAD: WORLD REFINERY PRODUCTION, BY COUNTRY<sup>1,2</sup>

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<sup>3</sup>In addition to the countries listed, Algeria, Colombia, Egypt, El Salvador, Iraq, Malaysia, Nigeria, Saudi Arabia, Serbia, Trinidad and Tobago, Venezuela, and Zambia produced secondary lead, but output was not officially reported; available information was inadequate to make reliable estimates of output.

<sup>4</sup>Reported figure.

<sup>5</sup>Includes lead content in antimonial lead.

<sup>6</sup>Duddar Lead-Zinc Mine project was suspended starting from 2012 to current time due to on-site maintenance and maintenance of underground system.

<sup>7</sup>Produced entirely from imported bullion and includes the lead content of alloys.

<sup>8</sup>Includes a small quantity of primary lead from domestic concentrate.