



2013 Minerals Yearbook

LEAD [ADVANCE RELEASE]

LEAD

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In 2013, domestic mine production of recoverable lead was 331,000 metric tons (t), slightly less than that in 2012 (table 1). Alaska and Missouri were the principal producing States accounting for the majority of domestic mine production.

In the United States, lead in concentrate was produced at nine mines that employed about 1,690 people. The value of domestic mine production in 2013 (based on the North American Producer Price) was \$837 million, essentially unchanged from that in 2012. Primary lead metal was produced at a smelter-refinery in Missouri.

Secondary (recycled) lead, derived principally from scrapped lead-acid batteries, increased by 4% from that in 2012 and accounted for 91% of refined lead production in the United States in 2013 (table 1). Nearly all the secondary lead was produced by seven companies operating 14 smelters.

World mine production of lead increased by 4% to 5.50 million metric tons (Mt) from 5.25 Mt in 2012. The United States ranked third in the world and accounted for about 6% of global lead mine production, compared with about 7% in 2012. China and Australia were the two leading producers in 2013, accounting for 53% and 13%, respectively, of global lead mine production (table 12). China's share of global lead mine production increased from 41% in 2009 to 53% in 2012, but remained unchanged in 2013. World production of refined lead (primary and secondary) was 10.5 Mt, essentially unchanged from that in 2012. The United States was the second-leading global producer of refined lead after China and accounted for 12% of global production. China produced about 46% of global refined lead (table 13).

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 2013, North American producers shipped 126.0 million SLI automotive type batteries including original equipment (OE) and replacement automotive-type batteries, essentially unchanged from that in 2012 (Battery Council International, 2014, p. 23–24).

According to the International Lead and Zinc Study Group (ILZSG), global consumption of refined lead was 11.1 Mt in 2013, about 6% greater than that in 2012. The leading refined-lead-consuming countries in 2013 were China, 45%; the United States, 15%; India, 4%; the Republic of Korea, 4%; and Germany, 3% (International Lead and Zinc Study Group, 2014b, p. 10–11, 16).

The 2013 average annual London Metal Exchange Ltd. (LME) cash price for lead was \$0.97 per pound, an increase of 4% from that of 2012. The Platts Metals Week North American Producer Price was \$1.15 per pound, essentially unchanged from that in 2012.

Legislation and Government Programs

The Reduction of Lead in Drinking Water Act became effective in January 2014. The new regulation requires all new potable water fittings and pipes to contain less than 0.25% lead. Producers were experimenting with a range of lead-free products to determine the best substitutes for lead. Substitutes including copper-silicon-zinc and copper-zinc-bismuth alloys were seen as potential replacements, but were expected to be more expensive (American Metal Market, 2013).

In October 2013, California enacted legislation (Assembly Bill 711) intended to protect wildlife from lead poisoning by requiring the use of lead-free ammunition for all hunting by July 1, 2019. California became the first State in the country to require the use of lead-free bullets and shot for all hunting (Center for Biological Diversity, 2013).

Production

Mine.—In 2013, domestic mines produced 331,000 t of recoverable lead, slightly less than that of 2012 (table 1). Lead mine production in the United States has decreased by 26% from 2003 to 2011 owing to shutdowns and curtailments at zinc and lead mines, but has remained essentially unchanged from 2011 to 2013. In 2013, there were 9 lead-producing mines operating in the United States (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. Domestic mine production data were collected by the U.S. Geological Survey (USGS) from a voluntary survey of lode-mines. The majority of operators of lead-producing mines responded to the survey in 2013.

Teck Alaska Inc. (a wholly owned subsidiary of Teck Resources Ltd., Vancouver, British Columbia, 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 a corporation organized under the provisions of the Alaska Native Claims Settlement Act. During 2013, Teck reported that production of lead in concentrate at Red Dog increased slightly to 96,700 t from 95,400 t in 2012 owing to improved mill recovery rates that more than offset lower mill-head ore grades. Proven and probable ore reserves at yearend 2013 totaled 45.4 Mt grading 4.1% lead (Teck Resources Ltd., 2014a, p. 53; 2014b, p. 42).

In 2013, Teck's Pend Oreille zinc-lead mine in northeastern Washington State remained on care-and-maintenance status. A core group of employees remained at Pend Oreille to facilitate a possible restart in the future, and all regulatory and environmental requirements were being met (Teck Resources Ltd., 2014a, p. 54).

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 2013, Hecla produced 18,200 t of lead in concentrate at Greens Creek, 5% less than that in 2012. Production at Lucky Friday, which had been temporarily suspended during 2012, resumed on a limited basis in early 2013 and reached full production in late September 2013. In the fourth quarter of 2013, ore was processed at an average rate of 759 tons per day. During 2013, mill recovery rates were approximately 93% for silver, 91% for lead, and 76% for zinc. All the lead and zinc concentrates produced at Lucky Friday during 2013 were shipped to Teck's smelter in Trail, British Columbia, Canada. Hecla produced about 9,310 t of lead in concentrate at Lucky Friday in 2013. As of December 31, 2013, total proven and probable lead reserves at the two mines were 653,000 t compared with 543,000 t at yearend 2012 (Hecla Mining Co., 2014, p. 40–42, 112).

Primary refined.—The Doe Run Resources Corp. (St. Louis, MO) operated the only domestic primary lead smelter-refinery facility, which was in Herculaneum, MO. Concentrates for the smelter-refinery were mainly from four Doe Run mills that were supplied with ore mined from six production shafts along the Viburnum Trend in southeastern Missouri. In 2013, domestic primary refined lead metal production was 114,000 t, a slight increase from 111,000 t in 2012 (table 1). At yearend 2013, Doe Run shut down operations at the smelter, per an agreement with the U.S. Environmental Protection Agency. (More information can be found in the Lead chapter of the 2012 Minerals Yearbook, volume I, Metals and Minerals.) After the smelter closed, the company expected to export all concentrates produced at its six mines in Missouri.

Secondary.—Domestic secondary production of refined lead in 2013 increased to 1.15 Mt from 1.11 Mt in 2012 and accounted for 91% of domestic lead refinery production, unchanged from that in 2012. Increased production from plants that were expanding or ramping up production more than offset declines from closures in 2013. The domestic secondary lead industry comprised 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 95% 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 2013, 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. Of the total lead recycled in 2013, the majority

was recovered by seven companies operating 12 plants in Alabama, California, Florida, Indiana, Minnesota, Missouri, New York, Pennsylvania, Tennessee, and Texas. Production for the nonrespondent was estimated by using prior-year levels as a basis (tables 1, 3).

In late March, Exide Technologies, Inc. (Milton, GA) closed its 70,000-metric-ton-per-year (t/yr) secondary lead smelter in Reading, PA. According to Exide, the decision was based on several factors, including price volatility in the lead market and increased operating costs owing to regulatory requirements. Exide's three remaining smelters were expected to provide sufficient lead to meet internal battery manufacturing needs (Exide Technologies, Inc., 2014, p. 28).

Consumption

Reported U.S. consumption of refined lead increased slightly in 2013 from that of 2012 owing primarily to increases in lead used for ammunition, casting metals, other metal products, and storage batteries (table 4). Consumption of lead in SLI and industrial lead-acid storage batteries represented about 86% of the total reported consumption of lead (tables 4, 6). Demand for lead was heavily reliant on the lead-acid battery industry and, in turn, the automotive sector. Battery Council International reported that 126.0 million lead-acid automotive batteries were shipped by North American producers in 2013, essentially unchanged from shipments in 2012. Shipments of replacement lead-acid automotive batteries (107.0 million) were essentially unchanged, but shipments of OE lead-acid automotive batteries (19.0 million) increased by 8% from those in 2012 (Battery Council International, 2014, p. 23–24).

East Penn Manufacturing Co. (Lyon Station, PA) announced plans to expand its lead-acid battery manufacturing facility in Lyon Station. The expansion expected to cost \$80 million, and was projected to open in 2015 and produce automotive and industrial batteries. The current facility was operating at nearly full capacity (Energy Storage Publishing Ltd., 2013).

Metalico Inc. (Cranford, NJ), a leading domestic producer of lead-based products in 2013, produced lead sheet, shot, strip, and various extruded products at four facilities. In 2013, sales of fabricated lead products were valued at \$72.8 million, a 10% increase compared with sales in 2012. The increase was attributed primarily to a higher average sales price of fabricated lead products and to a lesser extent, an increase in quantity sold during that time period (Metalico Inc., 2014, p. 42).

Prices

In 2013, the average annual North American Producer Price was unchanged and the LME cash prices increased by 4% from that in 2012 (table 1). The average monthly LME cash price for lead was \$1.06 per pound in January and trended downward during the first half of the year. Average monthly lead prices reached a low of \$0.920 per pound in May and increased to \$0.967 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 owing to uncertainty about the global economy and particularly the slowdown in China's economic growth. Lead, like all LME metals except for

zinc, ended the year priced lower than at the beginning of 2013 (CRU International Ltd., 2014, 9–10.)

Scrap prices were relatively stable during most 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 \$0.384 per pound in January to an annual low of \$0.364 per pound in October and was \$0.374 per pound at yearend 2013.

Foreign Trade

In 2013, imports of unwrought (refined) lead metal in pigs and bars for consumption totaled 500,000 t, a 43% increase from those of 2012. The leading source was Canada, as was the case in 2012, accounting for 51% of unwrought lead metal imports, a decrease from 69% in 2012. Unwrought lead metal imports from Mexico nearly doubled from those in 2012 to 111,000 t, accounting for 22% of refined lead imports in 2013. Refined lead imports from Australia increased to 46,800 t from 24,300 t in 2012 and accounted for about 9% of total refined lead imports (table 11). The increase in imports was partially attributable to lead consumers and traders accumulating lead stocks in anticipation of the planned closure of Doe Run's primary lead smelter in Herculaneum, MO, at yearend.

Total domestic exports of unwrought lead in 2012 were 41,600 t, 12% less than that in 2012. Mexico was the leading destination for the unwrought lead exported in 2013, accounting for about 63% of the total. Exports to Belgium decreased by 46% in 2013 compared with those in 2012 (table 10).

Domestic exports of lead in concentrate were 215,000 t, essentially unchanged from those of 2012. Nearly 63% of the lead in concentrate produced domestically was exported in 2013, 53% of which went to China. Exports to China declined by 40% from those in 2012 (table 10).

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 2013, the United States imported about 20.0 million SLI lead-acid batteries for consumption, compared with 19.5 million in 2012. Mexico was the leading provider of SLI batteries, accounting for 62% of those imported in 2013. SLI batteries were also imported from Austria, China, Colombia, Germany, the Republic of Korea, the Philippines, Taiwan, and Vietnam. The United States exported about 26.4 million spent SLI lead-acid batteries in 2013, 16% more than those in 2012. The majority of those units were shipped to Mexico (93%) and Canada (6%) for recycling. Much of the lead recovered from the exported spent batteries was recovered and 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 increased by 4% to 5.50 Mt from 5.25 Mt in 2012. The United States accounted for about 6% of global lead mine production, compared with about 7% in 2012, and ranked third in the world. China and Australia were the two leading producers in 2013, accounting for 53% and 13%, respectively, of global lead mine production (table 12). The increase in global mine production was due primarily to

increased production in Australia, China, North Korea, Peru, and Turkey that more than offset production decreases in Canada, Poland, and the United States. In 2013, 137,000 metric tons per year (t/yr) of global lead mine production capacity was added, principally in Australia, China, Guatemala, Mexico, and Peru, and about 80,000 t/yr of lead mine capacity was closed in Australia, Canada, and Peru (International Lead and Zinc Study Group, 2014b, p. 5, 22).

World production of refined lead (primary and secondary) was 10.5 Mt, essentially unchanged from that in 2012. The United States was the second-leading global producer of refined lead after China and accounted for 12% of global production. China produced about 46% of global refined lead (table 13). Refined lead production increased significantly in Australia, Canada, China, India, Italy, Poland, Sweden, and the United States. Secondary lead production represented about 52% of total world refined lead production in 2013. Excluding China, global secondary production accounted for 70% of refined lead production. In 2013, two primary lead plants opened in Italy and China and added about 140,000 t/yr of lead smelting capacity. Two secondary lead smelters closed, one in the United States and one in Belgium, removing 90,000 t/yr of secondary lead smelting capacity (International Lead and Zinc Study Group, 2014b, p. 5–6, 25).

According to the ILZSG, global consumption of refined lead was 11.1 Mt in 2013, about 6% greater than that in 2012. The leading refined-lead-consuming countries in 2013 were China, 45%; the United States, 15%; India, 4%; the Republic of Korea, 4%; and Germany, 3%. Global LME refined lead stocks were 213,950 t at yearend 2013, a 33% decline from those at yearend 2012 (International Lead and Zinc Study Group, 2014a, p. 10–11, 16).

European Union.—Recylex S.A. (Paris, France), a leading lead producer in Europe with smelters in Belgium and Germany, processed lead-bearing material from scrap battery treatment facilities in Belgium, France, and Germany. Total refined lead production from the company's smelters in 2013 was 140,000 t, an 8% decrease compared with 152,000 t in 2012, owing to a temporary maintenance shutdown at the smelter in Germany and the permanent closure of a smelter in Belgium during the second half of the year (Recylex S.A., 2014, p. 4).

During the first half of the year, Glencore Xstrata plc (Glencore International plc merged with Xstrata plc on May 2) reopened its Portovesme lead smelter in Sardinia, Italy, after a 4-year shutdown. The smelter had the capacity to produce 80,000 t/yr of refined lead. The Kivcet furnace at the smelter had been upgraded to allow for processing a variety of lead feeds, not just concentrates as was the case when it previously operated. Some of the lead produced was expected to be shipped to Glencore Xstrata's refinery in San Gavino, Italy, for upgrading (Ryan's Notes, 2013).

Australia.—Lead mine production in Australia in 2013 increased by about 14% (89,000 t) from that in 2012. In March 2013, Ivernica Inc. (Toronto, Ontario, Canada) announced that it had restarted its Paroo Station Mine (85,000-t/yr production capacity) in Western Australia. The announcement followed a July 2012 ruling by the Minister of Environment of Western Australia that approved conditions for the restart. The mine

had been shut down since April 2011 owing to concerns about possible lead contamination after lead-bearing mud was detected on shipping containers that had been transported from the mine to the Port of Fremantle. The rampup process was expected to take 8 months and the mine was expected to be operating at nameplate capacity by yearend 2013 (Ivernia Inc., 2013).

Canada.—In 2013, lead mine production in Canada declined by 41,000 t primarily owing to the closure of its largest lead-producing mine, Glencore Xstrata's Brunswick underground zinc-lead mine near Bathurst, New Brunswick. The mine and mill had the capacity to process 3.1 million metric tons per year of ore containing copper, lead, silver, and zinc. In June 2013, the Brunswick Mine closed after producing 13,500 t of lead in concentrates, compared with 50,900 t in 2012. In 2010, Xstrata had increased lead reserves at the Brunswick Mine which extended the mine life to 2013, from its previously anticipated closure in early 2010 (Xstrata plc, 2013, p. 34; Glencore Xstrata plc, 2014, p. 16).

In 2013, primary refined lead production at Teck's metallurgical complex at Trail was 86,400 t, a slight decrease from that of 2012. Teck also recycled 43,400 t of scrap containing lead, primarily lead-acid batteries and cathode ray tube glass, at Trail (Teck Resources Ltd., 2014a, p. 53).

China.—In 2013, China continued to be the leading global producer and consumer of lead and the leading producer of lead-acid batteries. In 2013, increases in production of refined lead were modest compared with more significant increases during the past several years. Refined lead production in 2013 increased slightly to 4.78 Mt from 4.70 Mt in 2012. Some analysts believed that refined lead production capacity exceeded refined lead production, and despite Government efforts to force consolidation, the average smelter utilization rate in China was about 60%. The ILZSG reported that one new lead smelter with the capacity to produce 60,000 t/yr of refined lead opened during 2013 in Yunnan Province. Lead in concentrate production in 2013 was about 2.90 Mt, a 4% increase from the 2.80 Mt produced in 2012 (table 12). One new mine with the capacity to produce 10,000 t/yr of lead in concentrate was opened in 2013 in Nei Mongol Autonomous Region. In 2013, 804,000 t of lead contained in ore and concentrates was imported (International Lead and Zinc Study Group, 2013, p. 26; 2014c, p. 21, 25).

Between 1999 and 2013, China's increased consumption of lead for the production of lead-acid batteries was attributed to growth in the production of automobiles, electric bicycles (e-bikes), and motorcycles. According to the ILZSG, consumption of lead in China increased by 9% to 4.98 Mt in 2013 from 4.57 Mt in 2012, compared with essentially no change from 2011 to 2012. According to CHR Metals Ltd., batteries for e-bikes were the leading application for lead in China, that unlike most countries that primarily use lead for automotive and industrial batteries China's e-bike fleet was estimated to be about 170 million at yearend 2013, compared to less than 20 million in 2004. CHR estimated that the end-use pattern for lead in China was lead-acid batteries for e-bikes, 45%; lead-acid batteries for automobiles, 27%; industrial type lead-acid batteries, 12%; and other uses, 16% (International Lead and Zinc Study Group, 2013b, p. 26; Hassall, 2014).

Peru.—In August, Trevali Mining Corp. (Vancouver, British Columbia, Canada) commenced production at its new Santander zinc-lead-silver mine in west-central Peru, approximately 215 kilometers northeast of Lima. By November, the mill at the mine was operating at full nameplate capacity of 2,000 metric tons per day. By the end of January 2014, the mill had produced 7,000 t of lead-silver concentrates (Trevali Mining Corp., 2014, p. 5).

Outlook

At its October 2013 meeting in Lisbon, Portugal, the ILZSG forecast global increases in lead consumption and production in 2014. Global lead consumption in 2014 is expected to increase by 5%, primarily owing to increased consumption in China for use in lead-acid batteries in automobiles, e-bikes, and standby power for telecommunications networks. Analysts have forecast that as many as 200 million e-bikes could be in use by 2015. Global lead mine production in 2014 is forecast to increase by 4% compared with that in 2013 owing to increased mine production in Australia and China. Global refined lead production is forecast to increase by 4% in 2014 owing to refined lead production increases in Australia, Belgium, China, India, Italy, Kazakhstan, and Peru. Note that in some cases, ILZSG world production estimates differ from USGS data. The ILZSG forecast that global refined lead consumption would exceed production by about 23,000 t in 2014. According to ILZSG projections, 2014 would be the first year that global refined lead consumption exceeded production since 2009 (International Lead and Zinc Study Group, 2013).

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TABLE 1
SALIENT LEAD STATISTICS¹

		2009	2010	2011	2012	2013
United States:						
Production:						
Mine, recoverable lead content: ²						
Quantity	metric tons	395,000	356,000	334,000	336,000	331,000
Value	thousands	\$757,000	\$854,000	\$895,000	\$845,000	\$837,000
Primary lead, refined content, domestic ores and base bullion	metric tons	103,000	115,000	118,000	111,000	114,000
Secondary lead, lead content	do.	1,110,000	1,140,000	1,130,000	1,110,000	1,150,000
Exports, lead content:						
Lead ore and concentrates	do.	287,000	299,000	223,000	214,000	215,000
Lead materials, excluding scrap	do.	82,000	83,500	47,200	53,400	48,500
Imports for consumption, lead content:						
Lead in base bullion	do.	844	602	434	1,020	1,900
Lead in pigs and bars	do.	251,000	271,000	313,000	349,000	500,000
Stocks, December 31, lead content:						
Primary lead	do.	W	W	W	W	W
At consumers and secondary smelters	do.	63,300	64,800	48,300	66,200 ^r	70,200
Consumption of metal, primary and secondary, lead content	do.	1,290,000	1,430,000	1,410,000	1,350,000 ^r	1,390,000
Price: ³						
North American Producer average, delivered	cents per pound	86.87	108.91	121.70	114.16	114.77
London Metal Exchange, pure lead, cash average	do.	77.95	97.42	108.92	93.53	97.15
World:						
Production, gross weight:						
Mine, lead content	metric tons	3,870,000 ^r	4,160,000 ^r	4,740,000 ^r	5,250,000 ^r	5,460,000 ^e
Primary refinery	do.	3,840,000 ^r	4,160,000 ^r	4,590,000 ^r	4,790,000 ^r	4,740,000 ^e
Secondary refinery	do.	4,760,000 ^r	5,060,000 ^r	5,280,000 ^r	5,340,000 ^r	5,470,000 ^e
Undifferentiated	do.	258,000 ^r	295,000 ^r	292,000 ^r	263,000 ^r	269,000 ^e

^eEstimated. ^rRevised. do. Ditto. W Withheld to avoid disclosing company proprietary data.

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

²Lead recoverable after smelting and refining. Data in table 12 represent lead in concentrate.

³Source: Platts Metals Week.

TABLE 2
LEADING LEAD-PRODUCING MINES IN THE UNITED STATES IN 2013, IN ORDER OF OUTPUT¹

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

Do., do. Ditto.

¹The mines on this list accounted for 100% of the U.S. mine production in 2013.

²For 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 RECOVERY¹

(Metric tons, lead content, unless otherwise specified)

	2012	2013
Kind of scrap:		
New scrap:		
Lead-base	17,600	19,200
Copper-base	--	--
Tin-base	1,530	1,530
Total	19,200	20,700
Old scrap:		
Battery-lead	1,050,000	1,090,000
All other lead-base	41,700	39,800
Copper-base	--	--
Total	1,090,000	1,130,000
Grand total	1,110,000	1,150,000
Form of recovery:		
As soft lead	863,000 ^r	860,000
In antimonial lead	236,000	282,000
In other lead alloys	9,960 ^r	7,890
In copper-base alloys	--	--
Total:		
Quantity	1,110,000	1,150,000
Value ²	\$2,790,000	\$2,910,000
	thousands	

^rRevised. -- 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 4
U.S. CONSUMPTION OF LEAD, BY PRODUCT¹

(Metric tons, lead content)

SIC ² code	Product	2012	2013
	Metal products:		
3482	Ammunition, shot and bullets	73,900	84,800
	Bearing metals:		
35	Machinery except electrical	W	W
371	Motor vehicles and equipment	W	W
37	Other transportation equipment	W	W
	Total	1,090	1,110
3351	Brass and bronze, billets and ingots	1,120 ^r	1,420
36	Cable covering, power and communication	(3)	(3)
15	Calking lead, building construction	(3)	(3)
	Casting metals:		
36	Electrical machinery and equipment	W	W
371	Motor vehicles and equipment	W	W
37	Other transportation equipment	W	W
3443	Nuclear radiation shielding	W	W
	Total	16,700	20,400
	Pipes, traps, other extruded products:		
15	Building construction	6,240	7,000
3443	Storage tanks, process vessels, etc.	(4)	(4)
	Total	6,240	7,000
	Sheet lead:		
15	Building construction	3,570	1,310
3443	Storage tanks, process vessels, etc.	W	W
3693	Medical radiation shielding	W	W
	Total	7,390	4,870
	Solder:		
15	Building construction	W	W
	Metal cans and shipping containers	-- ^r	W
367	Electronic components, accessories and other electrical equipment	6,220	7,960
371	Motor vehicles and equipment	W	W
	Total	6,280	8,200
	Storage batteries:		
3691	Storage battery grids, post, etc.	449,000	464,000
3691	Storage battery oxides	745,000	734,000
	Total storage batteries	1,190,000	1,200,000
27	Type metal, printing and allied industries	(3)	--
34	Other metal products ⁵	18,500	33,000
	Grand total	1,330,000	1,360,000
	Other oxides:		
285	Paint	W	W
32	Glass and ceramics products	W	W
28	Other pigments and chemicals	W	W
	Total	9,740	9,740
	Miscellaneous uses	20,000	20,500
	Grand total	1,350,000 ^r	1,390,000

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

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

²Standard Industrial Classification.

³Included with "Metal products: Other metal products."

⁴Included with "Metal products: Sheet lead: Building construction" to avoid disclosing company proprietary data.

⁵Includes lead consumed in foil, collapsible tubes, annealing, galvanizing, plating, electrowinning, and fishing weights.

TABLE 5
U.S. CONSUMPTION OF LEAD IN 2013, BY STATE^{1,2}

(Metric tons, lead content)

State	Lead in			Lead in copper- base scrap	Total
	Refined soft lead	antimonial lead	Lead in alloys		
California and Washington	25,300	31,800	2,340	--	59,500
Illinois	13,000	20,000	--	--	33,000
Iowa, Michigan, Missouri	21,700	1,860	W	--	23,600
Ohio and Pennsylvania	159,000	76,600	23,200	W	259,000
Arkansas and Texas	56,800	31,300	W	--	88,100
Alabama, Georgia, Oklahoma	17,300	23,200	W	--	40,500
Indiana, Kansas, Kentucky, Minnesota, Nebraska, Tennessee, Wisconsin	184,000	111,000	12,000	W	307,000
Connecticut, Maryland, New Jersey, New York, North Carolina, South Carolina	2,280	--	--	--	2,280
Other States	376,000	66,600	132,000	554	575,000
Total	856,000	362,000	169,000	554	1,390,000

W Withheld to avoid disclosing company proprietary data; included in "Other States." -- 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.

TABLE 6
U.S. CONSUMPTION OF LEAD IN 2013, BY CLASS OF PRODUCT^{1,2}

(Metric tons, lead content)

Product	Lead in			Lead in copper- base scrap	Total
	Refined soft lead	antimonial lead	Lead in alloys		
Metal products	68,300	86,700	W	W	161,000
Storage batteries	758,000	276,000	W	W	1,200,000
Miscellaneous ³	30,100	(4)	W	W	30,200
Total	856,000	362,000	169,000	554	1,390,000

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

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.

³Includes other oxides and gasoline additives.

⁴Withheld to avoid disclosing proprietary data; included in "Storage batteries."

TABLE 7
STOCKS OF LEAD AT CONSUMERS AND SECONDARY
SMELTERS IN THE UNITED STATES, DECEMBER 31^{1,2}

(Metric tons, lead content)

Year	Lead in			Lead in copper-base scrap	Total
	Refined soft lead	antimonial lead	Lead in alloys		
2012	42,900 [†]	23,400	W	W	66,200 [†]
2013	45,800	24,400	W	W	70,200

[†]Revised. W Withheld to avoid disclosing company proprietary data; included in "Total."

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

²Includes stocks at primary refineries.

TABLE 8
PRODUCTION AND SHIPMENTS OF LEAD PIGMENTS AND OXIDES IN THE UNITED STATES^{1,2}

(Metric tons and dollars)

Product	2012				2013			
	Production		Shipments ^e		Production		Shipments ^e	
	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	--	--	3,600	3,340,000 ^r	--	--	3,760	9,540,000
Leady oxide	779,000 ^r	740,000 ^r	NA	NA	744,000	707,000	NA	NA
Total	779,000 ^r	740,000 ^r	NA	NA	744,000	707,000	NA	NA

^eEstimated. ^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 9
U.S. IMPORTS FOR CONSUMPTION OF LEAD PIGMENTS AND COMPOUNDS, BY KIND¹

Kind	Quantity	
	(metric tons, lead content)	Value (thousands)
2012:		
Chrome yellow, molybdenum orange pigments, lead-zinc chromates	1,540	\$9,420
Litharge	1,870	6,280
Glass frits (undifferentiated)	26,500	51,200
Total	29,900	66,900
2013:		
Chrome yellow, molybdenum orange pigments, lead-zinc chromates	970	7,050
Litharge	1,670	4,640
Glass frits (undifferentiated)	30,900	53,400
Total	33,500	65,100

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

Source: U.S. Census Bureau.

TABLE 10
U.S. EXPORTS OF LEAD, BY COUNTRY¹

Country	2012		2013	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Ore and concentrates, lead content:				
Australia	--	--	74	\$23
Belgium	1,260	\$1,090	8,420	13,400
Canada	10,100	17,600	20,500	37,000
China	188,000	312,000	113,000	203,000
Italy	--	--	11,200	16,000
Japan	5,440	9,710	8,590	14,100
Korea, Republic of	8,290	19,200	52,600	102,000
Mexico	451	903	287	615
Taiwan	10	16	412	44
Other	317 [†]	344 [†]	22	13
Total	214,000	360,000	215,000	386,000
Base bullion, lead content:				
Canada	--	--	327	1,010
Korea, Republic of	65	837	--	--
Other	7	15	22	290
Total	72	852	349	1,300
Unwrought lead and lead alloys, lead content:				
Belgium	15,500	14,000	8,410	8,970
Canada	2,200	2,380	2,080	2,770
Chile	229	671	--	--
China	122	165	163	178
Costa Rica	--	--	235	204
Ecuador	(2)	5	1,000	850
India	93	88	--	--
Japan	1,470	898	6	4
Korea, Republic of	431	540	--	--
Malaysia	986	2,110	984	2,270
Mexico	25,000	34,900	26,300	43,600
Russia	--	--	620	1,710
United Arab Emirates	5	11	521	454
Venezuela	490	1,240	894	1,390
Other	464 [†]	799 [†]	327	289
Total	47,000	57,800	41,600	62,700
Wrought lead and lead alloys, lead content:				
Canada	1,450	3,470	1,520	3,040
Chile	523	625	286	388
China	183	253	259	786
Colombia	(2)	8	864	1,300
India	1,150	1,640	1,230	1,860
Mexico	1,080	1,210	891	814
Singapore	150	193	404	424
United Kingdom	157	366	172	215
Other	1,600 [†]	2,670 [†]	982	1,930
Total	6,300	10,400	6,610	10,800
Scrap, gross weight:				
Canada	4,650	6,120	5,700	8,650
China	1,420	1,770	4,360	1,950
India	7,260	9,600	7,240	11,900
Korea, Republic of	9,810	10,000	10,500	13,300
Mexico	485	325	485	325
United Arab Emirates	--	--	497	203
Other	2,270 [†]	2,680 [†]	6,160	9,170
Total	25,900	30,600	34,900	45,400

[†]Revised. -- 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 11
U.S. IMPORTS FOR CONSUMPTION OF LEAD, BY COUNTRY¹

Country	2012		2013	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Base bullion:				
Colombia	118	\$224	1,540	\$3,180
Mexico	695	3,540	148	319
Spain	208	141	210	174
Total	1,020	3,900	1,900	3,680
Pigs and bars, lead content:				
Australia	24,300	47,600	46,800	110,000
Belgium	2,010	3,930	1,440	3,410
Brazil	332	798	887	2,040
Canada	240,000	521,000	257,000	588,000
Chile	644	1,200	4,220	9,020
China	5,000	10,200	441	1,140
Colombia	1,010	2,060	--	--
Dominican Republic	291	555	440	976
Ecuador	899	1,740	2,020	4,300
France	637	1,690	11,900	28,300
Guatemala	--	--	639	1,410
India	3,890	8,080	1,020	2,160
Israel	377	871	4,190	9,270
Kazakhstan	--	--	4,980	11,800
Korea, Republic of	6,870	13,400	2,200	4,770
Mexico	56,100	72,500	111,000	155,000
Peru	1	9	39,600	84,300
Russia	4,330	8,600	5,220	11,900
South Africa	27	128	45	204
Sri Lanka	--	--	1,030	2,320
United Kingdom	340	696	2,370	6,240
Venezuela	--	--	980	1,780
Other	1,490 ^r	3,540 ^r	738	1,760
Total	349,000	699,000	500,000	1,040,000
Reclaimed scrap, including ash and residues, lead content:				
Canada	4,400 ^r	1,960 ^r	10,200	3,400
Colombia	19	40	--	--
Dominican Republic	7,330	10,500	1,810	2,840
Honduras	526	1,310	170	422
Mexico	1,640	1,870	2,030	1,900
Venezuela	--	--	482	1,070
Other	2,860 ^r	3,450 ^r	939	943
Total	16,800 ^r	19,100 ^r	15,600	10,600
Wrought lead, all forms, including wire and powders, gross weight:				
Argentina	141	336	59	128
Canada	252	775	57	239
Czech Republic	865	1,570	--	--
Germany	675	3,880	491	3,140
India	86	295	119	377
Japan	26	193	1	68
Sweden	20	311	27	485
United Kingdom	179	893	641	1,550
Other	24 ^r	118 ^r	46	163
Total	2,270	8,370	1,440	6,140

^rRevised. -- Zero.

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

Source: U.S. Census Bureau.

TABLE 12
LEAD: WORLD MINE PRODUCTION OF LEAD IN CONCENTRATE, BY COUNTRY^{1,2}

(Metric tons, lead content)

Country ³	2009	2010	2011	2012	2013 ^c
Argentina	24,753	22,554	26,074	26,475 ^r	26,000
Australia	566,000	625,000	621,000	622,000 ^{r, e}	711,000
Bolivia	84,538	72,803	100,051	79,044 ^r	82,000
Bosnia and Herzegovina ^c	3,000 ^r	3,000 ^r	4,000 ^r	4,000 ^r	3,000
Brazil	15,890	19,650	15,100	16,953 ^r	17,000
Bulgaria	12,703 ^r	12,136 ^r	10,121 ^r	14,366 ^r	15,986 ⁴
Burma ^c	5,000	7,000	8,700	9,800 ^{r, 4}	10,000
Canada	68,839	64,845	67,505 ^r	61,224 ^r	20,188 ⁴
Chile	1,511	695	841	410 ^r	1,000
China ^c	1,600,000	1,850,000	2,400,000	2,800,000	2,900,000
Greece	17,027 ^r	12,200 ^{r, e}	16,592 ^r	18,062 ^r	18,000 ⁴
Honduras	14,471	16,944	16,954	12,400 ^r	11,600
India	86,000 ^r	86,000 ^r	88,000 ^r	103,000 ^r	106,000
Iran ^{e, 5}	20,000	25,000 ^r	40,000 ^r	35,000	42,000
Ireland ^c	43,000	39,100	50,700	51,000	51,000
Italy ^c	800	800	800	-- ^r	--
Kazakhstan	33,600 ^r	35,400 ^r	38,800 ^r	38,100 ^{r, e}	38,000
Korea, North	22,000 ^r	26,000 ^r	32,000 ^r	38,000 ^r	59,000
Korea, Republic of	2,064	1,168	1,289 ^r	1,434 ^r	1,500
Macedonia ^c	38,000	41,000 ^r	37,000 ^r	36,000	36,000
Mexico	143,838	192,062	223,717	210,382	210,000
Morocco	49,030 ^r	46,400 ^r	43,800 ^r	39,100 ^r	40,000
Namibia	10,129	10,301 ^r	9,139 ^r	9,000 ^{r, e}	9,000
Peru	302,459	261,990	230,199	249,236 ^r	266,472 ⁴
Poland:					
Pb content of Pb-Zn ore	51,500	35,300	28,200 ^r	26,600 ^r	25,000
Pb content of Cu ore	28,900	24,900	24,900 ^r	30,000 ^r	26,710
Total	80,400	60,200	53,100 ^r	56,600 ^r	51,710
Russia ^c	70,000	97,000	94,500	195,000 ^r	195,000
South Africa	49,149	50,625	54,460	52,489 ^r	53,000
Sweden	69,300 ^{r, e}	67,700 ^{r, e}	61,999 ^r	63,551 ^r	59,556
Tajikistan ^c	800	800	800	840 ^r	840
Turkey	26,000	38,000 ^r	40,000 ^r	56,000 ^r	78,000 ⁴
United Kingdom ^c	500	500	500	500	500
United States	406,000	369,000	342,000	345,000	340,000 ⁴
Vietnam ^c	7,700 ⁴	6,500 ^r	6,400 ^r	6,300 ^r	6,000
Grand total	3,870,000 ^r	4,160,000 ^r	4,740,000 ^r	5,250,000 ^r	5,500,000

^cEstimated. ^rRevised. -- Zero.

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

²Includes data available through February 2, 2015.

³In addition to the countries listed, Nigeria, Serbia, and Uzbekistan may have produced lead, but information is inadequate to formulate reliable estimates of output levels.

⁴Reported figure.

⁵Year beginning March 21 of that stated.

TABLE 13
LEAD: WORLD REFINERY PRODUCTION, BY COUNTRY^{1,2}

(Metric tons)

Country ³	2009	2010	2011	2012	2013 ^c
Argentina:					
Primary	12,558	14,245	11,859	16,445 ^r	13,800
Secondary	70,000 ^e	63,000	72,700	73,820 ^r	69,900
Total	82,600 ^e	77,245	84,559	90,265 ^r	83,700
Australia:					
Primary	204,000	178,000	187,000	160,000	177,000
Secondary ^e	25,000	26,000	26,000	24,000	24,000
Total ^c	229,000	204,000	213,000	184,000	201,000
Austria, secondary	22,197	25,499	26,208	24,504 ^r	23,000
Belgium, secondary	109,000	105,000 ^{r,e}	88,129 ^r	87,958 ^r	87,900
Bolivia	418	310	269	250 ^r	330
Brazil, secondary	104,160	114,887	138,537	165,397 ^r	165,400 ⁴
Bulgaria, primary and secondary	99,483 ^r	99,116 ^r	90,933 ^r	86,156 ^r	90,742 ⁴
Burma, primary	200 ^e	--	--	200 ^r	200
Canada:					
Primary	101,484	105,836	112,531	133,495	128,706 ⁴
Secondary	157,370	167,101	170,059 ^r	144,570	159,595 ⁴
Total	258,854	272,937	282,590 ^r	278,065	288,301 ⁴
China:^e					
Primary	2,480,000	2,840,000	3,200,000	3,300,000	3,280,000
Secondary	1,230,000	1,360,000	1,400,000	1,400,000	1,500,000
Total	3,710,000	4,200,000	4,600,000	4,700,000	4,780,000
Czech Republic, secondary ^c	29,000	30,000	32,000	30,000	28,000
Estonia, secondary	5,283 ^r	7,199 ^r	7,840 ^r	8,046 ^r	7,100 ⁴
France, secondary ^c	82,000 ^r	71,000 ^r	80,000 ^r	83,000 ^r	71,000
Germany:^c					
Primary	104,900 ⁴	125,000	136,000	140,000	151,000
Secondary	285,700 ⁴	279,000	293,000	290,000	249,000
Total	390,600 ⁴	404,000	429,000	430,000	400,000
Greece, secondary	-- ^r	-- ^r	-- ^r	-- ^r	--
India:					
Primary	58,000 ^r	62,000 ^r	72,000 ^r	110,000 ^r	116,000
Secondary	274,000 ^r	305,000	347,000 ^r	350,000 ^r	355,000
Total	332,000 ^r	367,000 ^r	419,000 ^r	460,000 ^r	471,000
Indonesia, secondary ^c	18,000	18,000	17,000	17,000	16,000
Iran:^c					
Primary	20,000	20,000	25,000 ^r	25,000 ^r	20,000
Secondary	55,000	55,000	57,000 ^r	56,000 ^r	56,000
Total	75,000	75,000	82,000 ^r	81,000 ^r	76,000
Ireland, secondary ^c	19,000	20,000	20,000	20,000	20,000
Israel, secondary	26,000	27,000	27,000 ^e	21,791 ^r	22,418 ⁴
Italy:					
Primary	17,000 ^r	-- ^r	-- ^r	-- ^r	30,000
Secondary	132,000 ^r	150,000 ^r	149,500 ^r	138,400 ^r	150,000
Total	149,000	150,000 ^r	149,500 ^r	138,400 ^r	180,000
Japan:					
Primary	96,794	101,610	100,078	91,037 ^r	95,000
Secondary	95,402 ^r	114,218 ^r	117,937 ^r	117,957 ^r	115,000
Total	192,196 ^r	215,828 ^r	218,015 ^r	208,994 ^r	210,000
Kazakhstan, primary and secondary	80,994	103,110	111,249	88,099 ^r	90,000
Kenya, secondary ^c	500	250	250	250	250
Korea, North, primary and secondary ^c	4,000 ^r	3,000 ^r	3,000 ^r	3,000 ^r	3,000
Korea, Republic of:					
Primary	216,918	197,900	256,851	280,000 ^r	227,700 ⁴
Secondary	110,000 ^r	130,000 ^r	160,000 ^r	180,000 ^r	200,000 ⁴
Total	326,918 ^r	327,900 ^r	416,851 ^r	460,000 ^r	427,700 ⁴

See footnotes at end of table.

TABLE 13—Continued
LEAD: WORLD REFINERY PRODUCTION, BY COUNTRY^{1,2}

(Metric tons)

Country ³	2009	2010	2011	2012	2013 ^c
Mexico:					
Primary ⁵	85,411 ^r	110,980	101,729	112,431 ^r	100,000
Secondary ^c	154,000	175,000	216,000	303,000	300,000
Total ^c	239,411 ^r	286,000	318,000	415,431 ^r	400,000
Morocco:					
Primary	49,030 ^r	38,237 ^r	36,469 ^r	38,000 ^r	38,000
Secondary ^c	3,000	3,000 ^r	3,000 ^r	2,500	2,500
Total ^c	52,000 ^r	41,200 ^r	39,500 ^r	40,500 ^r	40,500
Mozambique, secondary	--	--	--	892	1,704 ⁴
Netherlands, secondary ^c	16,000 ^r	17,000	17,000	17,000	17,000
New Zealand, secondary ^c	13,000	9,000	9,000	9,000	9,000
Pakistan, secondary	85	2,899 ^r	919 ^r	2,900 ^r	2,000
Peru, primary ⁶	26,599	--	--	--	467 ⁴
Philippines, secondary ^c	32,000	30,000	34,000	32,000 ^r	32,000
Poland:					
Primary	38,000 ^r	38,000 ^r	47,000 ^r	47,000 ^r	39,000 ⁴
Secondary	62,400 ^r	82,000 ^r	87,000 ^r	87,000 ^r	103,000 ⁴
Total	100,400 ^r	120,000 ^r	134,000 ^r	134,000 ^r	142,000 ⁴
Portugal, secondary	7,000 ^r	9,000 ^r	6,000 ^r	5,000 ^r	4,000 ⁴
Romania:					
Primary	34,000 ^r	9,000 ^r	11,000 ^r	6,500 ^r	1,350
Secondary ^c	5,000	3,000	3,000	3,000	3,000
Total ^c	39,000 ^r	12,000 ^r	14,000 ^r	9,500 ^r	4,350
Russia, primary and secondary ^c	73,000	89,000	86,700	85,100 ^r	85,000
Slovenia, secondary ^c	14,000	14,000	15,000 ^r	14,000 ^r	12,000
South Africa, secondary	58,000	51,000	56,000	54,000 ^r	54,000
Spain, secondary ^c	138,000 ^r	165,000	177,000 ^r	160,000 ^r	157,000
Sweden:^c					
Primary	55,000 ^r	56,000 ^r	52,400 ^r	62,000 ^r	69,000
Secondary	42,000 ^r	40,000 ^r	41,000 ^r	44,000 ^r	45,000
Total	97,000 ^r	96,000 ^r	93,400 ^r	106,000 ^r	114,000
Switzerland, secondary ^c	5,000 ^r	5,000 ^r	3,000 ^r	2,500 ^r	2,500
Taiwan, secondary ^c	40,000	35,000	35,000	35,000	35,000
Thailand, secondary ^c	55,504 ⁴	55,500 ⁴	55,000	55,000	55,000
Uganda, secondary ^c	800	800	800	800	800
Ukraine, secondary ^c	7,000	7,000	13,500 ^r	13,700 ^r	14,000
United Arab Emirates, secondary	-- ^r	-- ^r	-- ^r	-- ^r	--
United Kingdom:^c					
Primary	135,000	151,000 ^r	125,000 ^r	157,000 ^r	137,000
Secondary	144,000	144,000	144,000	155,000 ^r	155,000
Total	279,000	295,000 ^r	269,000 ^r	312,000 ^r	292,000
United States:					
Primary	103,000	115,000	118,000	111,000	114,000 ⁴
Secondary	1,110,000	1,140,000	1,130,000	1,110,000	1,150,000 ⁴
Total	1,210,000	1,260,000 ^r	1,250,000	1,220,000	1,260,000 ⁴
Grand total	8,850,000 ^r	9,520,000 ^r	10,200,000 ^r	10,400,000 ^r	10,500,000
Of which:					
Primary	3,840,000 ^r	4,160,000 ^r	4,590,000 ^r	4,790,000 ^r	4,740,000
Secondary	4,760,000 ^r	5,060,000 ^r	5,280,000 ^r	5,340,000 ^r	5,470,000
Undifferentiated	258,000 ^r	295,000 ^r	292,000 ^r	263,000 ^r	269,000

^cEstimated. ^rRevised. -- Zero.

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

²Includes data available through February 10, 2015. 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 13—Continued
LEAD: WORLD REFINERY PRODUCTION, BY COUNTRY^{1,2}

³In addition to the countries listed, Algeria, Colombia, Egypt, El Salvador, Iraq, Malaysia, Nigeria, Republic of Korea, Saudi Arabia, Serbia, Trinidad and Tobago, Turkey, Venezuela, and Zambia produced secondary lead, but output is not officially reported; available general information is inadequate for the formation of reliable estimates of output levels.

⁴Reported figure.

⁵Includes lead content in antimonial lead.

⁶In 2012, about 312 metric tons of leaching lead were produced. La Oroya smelter and refinery will be re-opened in 2013.