MERCURY

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As has been the case since late 1990, nearly all domestic mercury production in 1998 was of secondary origin, derived from recycled mercury-containing devices. No domestic mine produced mercury as its primary product. Several companies were engaged in mercury refining, the three largest being in the Eastern and Central United States. Chlorine-caustic soda production was believed to have again been the largest end use for mercury.

Legislation and Government Programs

On January 23, the U.S. Environmental Protection Agency (EPA) and ASARCO Incorporated signed a historic agreement regarding alleged hazardous waste and water violations at two of Asarco's facilities. According to the EPA, it was the first time that the Government had agreed to a consolidated settlement with a company regarding violations of different statutes at different facilities. Asarco agreed to invest $50 million to reduce heavy metal, including mercury, discharges at its Ray Mine complex in Arizona. Also noteworthy in the agreement was Asarco's commitment to establish a court-enforced environmental management system to identify and correct the causes of the company's noncompliance with environmental regulations. The new management system will be implemented at Asarco's 38 facilities in 6 States and be supervised by the Federal district court (U.S. Environmental Protection Agency, 1998a).

On February 25, the EPA issued a report on toxic air emissions from electric power plants. The report examined air emissions from selected utilities that burn coal, natural gas, or oil and that produce more than 25 megawatts of electricity. Although the study found no mercury emissions from gas- or oil-fired utilities, it concluded that mercury emissions from coal-fired utilities was the air pollutant of greatest potential concern to public health and that this source accounted for nearly one-third of the anthropogenic mercury emissions in the United States (U.S. Environmental Protection Agency, 1998b).

Production

Since late 1990, no domestic mine has produced mercury as its primary product. Owing in part to the environmental regulations to control mercury discharges to the environment, some domestic mines and plants recovered small amounts of mercury as part of their environmental stewardship. These mines and plants were located in areas that historically have produced large amounts of mercury, such as California, Nevada, and Utah.

Nearly all the mercury produced in the United States was derived from secondary sources, including spent batteries, mercury vapor and fluorescent lamps, switches, dental amalgams, measuring devices, control instruments, and laboratory and electrolytic refining wastes. The secondary processors typically use high-temperature retorting to recover mercury from compounds and distillation to purify the contaminated liquid mercury metal. In 1998, refining of recycled mercury was dominated by three companies--Bethlehem Apparatus Co., Hellertown, PA, D.F.G. Mercury Corp., Evanston, IL, and Mercury Waste Solutions, Inc., Minneapolis, MN.

On May 12, Mercury Waste Solutions announced that it had completed its acquisition of certain assets and liabilities of Mercury Refining Co., Inc. which had been one of the largest domestic mercury recyclers and refiners for 40 years (Mercury Waste Solutions, Inc., 1998).

Consumption

The U.S. Geological Survey (USGS) discontinued publication of reported data on mercury consumption by end use, owing to the low response rate by industry to the USGS canvass.

In 1998, the largest use of mercury was still believed to be the electrolytic production of chlorine and caustic soda. The quantity of mercury consumed in this application, however, was expected to decline as U.S. manufacturers replace existing plants that use mercury cells. In the electrical industry, mercury consumption was also declining. In many applications, mercury switches were being replaced with either electronic switches or other special switches. In fluorescent lighting, mercury content was reduced to the extent that light bulbs produced in the late 1990's contain less than 50% of the mercury used in those manufactured in the mid-1980's.

Regulations having virtually eliminated the use of mercury in electrical batteries, the only mercury oxide batteries produced were for military and medical equipment. Only in dental applications, where it is the most cost-effective and longest lasting dental cavity-filler, has mercury use remained steady.

World Review

In 1998, mercury production at the Khaydarkan mining complex in Kyrgyzstan increased slightly to 620 metric tons, compared with 610 tons in 1997. Essentially all the mercury may have been exported, primarily to China.

Outlook

Ever stricter environmental regulations and the development of new technology are expected to be the primary factors affecting the supply of and demand for mercury in the near term. Environmental regulations and technology development likely will work in tandem to reduce the demand for mercury in commercial products. Even as the per-unit mercury content of products declines, regulations on the disposal of mercury will result in more recycling of mercury-bearing material to recover the contained mercury. As a result, secondary mercury is expected to remain the principal component of domestic supply. Other potential sources of domestic supply could include sale of the mercury contained in the National Defense Stockpile and the mercury resulting from the dismantling of mercury cells in some chloralkali operations.

References Cited

U.S. Environmental Protection Agency, 1998a, EPA and ASARCO Incorporated sign landmark environmental agreement; affects 38 Asarco plants nationwide: Washington DC, U.S. Environmental Protection Agency press release, January 23, 3 p.

———1998b, EPA issues new report on air toxics from power plants: Washington, DC, U.S. Environmental Protection Agency press release, February 25, 2 p.

Mercury Waste Solutions, Inc., 1998, Mercury Waste Solutions, Inc. completes acquisition of Mercury Refining Co. Inc.: Minneapolis, MN, Mercury Waste Solutions press release, May 12, 1 p.

SOURCES OF INFORMATION

U.S. Geological Survey Publications

Mercury. Ch. in United States mineral resources, U.S. Geological Survey Professional Paper 820, 1973.

Mercury. Ch. in Mineral Commodity Summaries, annual.[1]

[1]Prior to January 1996, published by the U.S. Bureau of Mines.

TABLE 1
SALIENT MERCURY STATISTICS 1/

(Metric tons, unless otherwise specified)

	1994	1995	1996	1997	1998
United States:					
Secondary production, industrial	466	534	446	389	NA
Shipments from the National Defense Stockpile 2/	86	--	--	--	--
Imports for consumption	129	377	340	164	128
Exports	316	179	45	134	63
Industry stocks, yearend 3/	469	321	446	203	NA
Industrial consumption	483	436	372	346	NA
Price: 4/					
D.F. Goldsmith, average per flask	$194.45	$247.40	$261.65	NA	NA
Free market, average per flask	NA	NA	NA	$159.52	$139.84
World: Mine production	1,960	3,250	2,580	2,470 r/	2,320 e/

e/ Estimated. r/ Revised. NA Not available.

1/ Data are rounded to three significant digits, except prices.

2/ Primary mercury.

3/ Stocks at consumers and dealers only. Mine stocks withheld to avoid disclosing company proprietary data.

4/ Source: Platt's Metals Week.

TABLE 2
U.S. IMPORTS AND EXPORTS OF MERCURY, BY COUNTRY 1/

(Gross weight, unless otherwise specified)

	1997		1998	
Country	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Imports:				
Canada	4	$5	8	$8
Kazakhstan	--	--	52	215
Kyrgyzstan	53	219	--	--
South Africa	32	136	--	--
Spain	19	90	(2/)	3
Taiwan	36	105	--	--
United Kingdom	17	141	68	325
Other	3	8	(2/)	8
Total	164	704	128	559
Exports:				
Brazil	5	34	2	15
Canada	3	21	6	39
Germany	2	9	1	17
Hong Kong	97	245	--	--
Korea, Republic of	2	19	1	10
Mexico	7	51	20	94
United Kingdom	7	72	6	12
Venezuela	--	--	14	44
Other	11	111	13	170
Total	134	562	63	401

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 3
MERCURY: WORLD MINE PRODUCTION, BY COUNTRY 1/ 2/

(Metric tons)

Country	1994	1995	1996	1997 e/	1998 e/
Algeria	414	292	368	370	370
China e/	470	780	510	830 r/	600
Finland	83	90	88	90	80
Kyrgyzstan	379	380	584	610 r/	620 3/
Mexico e/	12	15	15	15	15
Russia e/	50	50	50	50	50
Slovakia	50	50	20	20	20
Slovenia	6	5	5	5	5
Spain	393	1,497	862	413 r/ 3/	500
Tajikistan e/	55	50	45	40	35
Ukraine e/	50 3/	40	30	25	20
United States 4/	W	W	W	W	NA
Total	1,960	3,250	2,580	2,470 r/	2,320

e/ Estimated. r/ Revised. NA Not available. W Withheld to avoid disclosing company proprietary data; excluded from "Total."

1/ World totals and estimated data are rounded to three significant digits; may not add to totals shown.

2/ Table includes data available through April 29, 1999.

3/ Reported figure.

4/ Mercury was produced only as a byproduct of gold mining.