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## **Appendix B**

# **TRI Release and Waste Management Data for Metals and Metal Category Compounds, 2001**

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## Appendix B – TRI Release and Waste Management Data for Metals and Metal Category Compounds, 2001

**Table B-1: TRI On-site and Off-site Releases of Metals and Metal Category Compounds, 2001**

Chemical	Total Air Emissions Pounds	Surface Water Discharges Pounds	On-site Releases							Total On-site Releases Pounds	Off-site Releases	Total On- and Off-site Releases Pounds
			Underground Injection		On-site Land Releases				Transfers Off-site to Disposal Pounds			
			Class I Wells Pounds	Class II-V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other Landfills Pounds	Land Treatment Pounds	Surface Impoundments Pounds			Other Disposal Pounds	
Aluminum* (CAS number 7429-90-5)	1,297,306	8,333	0	0	2,620,508	2,348,677	0	4,445	4,109,733	10,389,002	6,988,074	17,377,075
Antimony and antimony compounds	94,422	80,519	6,983	710,028	1,077,155	676,687	328	8,657,734	10,694,219	21,998,075	3,684,420	25,682,495
Arsenic and arsenic compounds	179,646	142,617	65,713	1,466,028	3,815,552	5,837,146	60,031	89,999,905	277,301,225	378,867,863	3,204,790	382,072,653
Barium and barium compounds	2,767,839	1,493,080	35,514	1,965,433	3,518,505	87,880,484	2,225,810	64,931,934	48,232,389	213,050,988	47,268,686	260,319,674
Beryllium and beryllium compounds	5,004	10,286	5,200	0	418,121	192,585	1,422	207,948	55,485	896,051	44,205	940,256
Cadmium and cadmium compounds	22,418	2,786	72,292	90,000	5,690,677	263,412	13	2,451,979	4,738,797	13,332,374	2,679,893	16,012,267
Chromium and chromium compounds	967,804	193,582	2,189,245	134,684	4,255,029	7,904,393	197,448	15,669,044	73,519,845	105,031,075	25,877,309	130,908,384
Cobalt and cobalt compounds	89,108	51,089	19,530	16,000	790,745	1,268,700	81,414	3,218,546	9,282,071	14,817,203	1,623,836	16,441,039
Copper and copper compounds	2,237,952	465,223	230,261	717,768	7,925,730	17,347,896	424,748	228,265,911	754,465,213	1,012,080,702	25,365,177	1,037,445,879
Lead and lead compounds	1,633,122	413,420	206,138	6,026,683	18,610,199	20,536,031	642,320	148,207,402	191,423,923	387,699,237	55,292,471	442,991,708
Manganese and manganese compounds	2,781,660	6,402,174	11,316,486	1,165,027	7,359,701	81,452,575	1,297,594	47,066,194	210,858,239	369,699,649	79,577,658	449,277,307
Mercury and mercury compounds	150,463	1,805	1,741	8,035	60,009	127,263	3,333	1,251,113	3,074,272	4,678,034	228,283	4,906,317
Nickel and nickel compounds	1,385,792	265,808	727,983	275,375	6,685,476	5,692,642	153,179	12,929,861	28,003,200	56,119,316	21,125,404	77,244,719
Selenium and selenium compounds	580,138	54,120	39,734	0	3,291,889	452,487	952	622,606	3,444,843	8,486,769	1,708,553	10,195,322
Silver and silver compounds	18,206	4,644	18,076	97,000	584,883	112,442	228	347,201	640,580	1,823,260	171,463	1,994,723
Thallium and thallium compounds	6,204	11,605	0	0	296,609	552,565	13,564	1,056,817	1,897,120	3,834,484	62,260	3,896,744
Vanadium** and vanadium compounds	1,647,073	640,937	896,275	4,807	497,298	15,038,825	445,255	20,477,801	44,197,306	83,845,577	8,979,260	92,824,837
Zinc* and zinc compounds	7,030,484	2,188,392	537,865	9,163,584	52,301,939	42,356,672	305,255	306,855,790	370,486,395	791,226,376	216,766,241	1,007,992,618
Total	22,894,640	12,430,420	16,369,036	21,840,452	119,800,025	290,041,482	5,852,893	952,222,231	2,036,424,855	3,477,876,035	500,647,983	3,978,524,018

**Note:** On-site Releases are from Section 5 of Form R. Off-site Releases are from Section 6 (transfers off-site to disposal) of Form R. Off-site Releases include metals and metal category compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. Off-site Releases do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release.

\* Only fume or dust forms are reportable.

\*\* Except when contained in an alloy.

## Appendix B – TRI Release and Waste Management Data for Metals and Metal Category Compounds, 2001



**Table B-2: TRI Off-site Releases of Metals and Metal Category Compounds, 2001**

Chemical	Storage Only <sup>a</sup> Pounds	Solidification /Stabilization Metals Only <sup>b</sup> Pounds	Wastewater Treatment (Excluding POTWs) Metals Only <sup>c</sup> Pounds	Transfers to POTWs Metals Only <sup>d</sup> Pounds	Under-ground Injection Pounds	Landfills/ Disposal Surface Impound-ments Pounds	Land Treatment Pounds	Other Land Disposal Pounds	Other Off-site Management Pounds	Transfers to Waste Broker for Disposal Pounds	Unknown <sup>e</sup> Pounds	Off-site Releases
												Transfers Off-site to Disposal Pounds
Aluminum* (CAS number 7429-90-5)	2,567,579	662,000	255	1,411	11	4,060,461	0	61,423	2,488	3,596	13,848	7,373,072
Antimony and antimony compounds	18,813	423,040	2,559	92,465	2,795	2,876,399	4,433	83,217	91,269	137,038	62,775	3,794,803
Arsenic and arsenic compounds	17,442	431,306	1,778	7,333	132,847	2,621,525	50,745	222,303	79,606	96,860	96,824	3,758,569
Barium and barium compounds	45,820	2,531,840	83,053	270,846	3,915	29,072,311	566,874	9,480,819	7,459,753	658,195	215,396	50,388,822
Beryllium and beryllium compounds	0	895	5	5	0	51,331	0	7,259	1,242	45	0	60,782
Cadmium and cadmium compounds	0	604,545	356	2,443	1,764	2,988,703	9,509	0	3,924	504,928	116,008	4,232,180
Chromium and chromium compounds	105,024	8,199,127	859,606	291,860	433,319	16,417,845	157,926	674,695	429,841	706,885	356,822	28,632,949
Cobalt and cobalt compounds	116,390	126,167	5,737	21,079	430	1,036,198	44,857	92,718	57,278	67,608	93,940	1,662,402
Copper and copper compounds	213,944	5,638,938	1,045,799	230,802	191,295	17,826,673	80,265	806,362	672,872	1,047,814	213,359	27,968,123
Lead and lead compounds	288,905	27,120,108	95,004	48,949	26,891	33,005,311	125,907	424,753	714,562	1,943,806	864,181	64,658,377
Manganese and manganese compounds	25,312	15,675,035	3,332,623	617,236	10,381	63,539,053	452,717	2,654,336	2,777,288	596,044	43,494	89,723,518
Mercury and mercury compounds	7,448	77,564	2,685	470	270	102,297	904	2,062	10,714	24,965	17,501	246,878
Nickel and nickel compounds	226,463	2,419,572	327,171	199,094	57,623	18,066,917	182,526	519,303	446,865	488,878	183,985	23,118,397
Selenium and selenium compounds	388	26,725	2,515	766	632	1,598,111	72,352	26,205	795	666	780	1,729,935
Silver and silver compounds	3,875	31,782	1,268	3,561	15	128,127	0	0	2,103	1,857	260	172,848
Thallium and thallium compounds	0	17,810	20	0	0	43,389	0	255	548	0	250	62,272
Vanadium** and vanadium compounds	369,456	333,547	6,587	10,224	1,650	6,715,664	69,128	864,633	968,893	56,098	49,214	9,445,094
Zinc* and zinc compounds	615,843	124,118,700	1,295,146	412,628	3,413,046	129,281,364	200,037	1,531,768	762,180	2,179,254	272,096	264,082,063
<b>Total</b>	<b>4,622,702</b>	<b>188,438,700</b>	<b>7,062,167</b>	<b>2,211,172</b>	<b>4,276,883</b>	<b>329,431,678</b>	<b>2,018,180</b>	<b>17,452,111</b>	<b>14,482,221</b>	<b>8,514,537</b>	<b>2,600,733</b>	<b>581,111,084</b>

**Note: Off-site Releases** are from Section 6 (transfers off-site to disposal) of Form R.

**a** Storage only (disposal code M10) indicates that the toxic chemical is sent off-site for storage because there is no known disposal method. Amounts reported as transferred to storage only are included as a form of disposal (off-site release). See Box 1-5.

**b** Beginning in reporting year 1997, transfers to solidification/stabilization of metals and metal category compounds (waste treatment code M41) are reported separately from transfers to solidification/stabilization of non-metal TRI chemicals (waste treatment code M40). Because this treatment method prepares a metal for disposal, but does not destroy it, such transfers are included as a form of disposal (off-site release). See Box 1-6. Reports under code M40 of metals and metal category compounds have been included in solidification/stabilization of metals and metal category compounds in this report.

**c** Beginning in reporting year 1997, transfers to wastewater treatment (excluding POTWs) of metals and metal category compounds (waste treatment code M61) are reported separately from transfers to wastewater treatment of non-metal TRI chemicals (waste treatment code M60). Because wastewater treatment does not destroy metals, such transfers are included as a form of disposal (off-site release). See Box 1-6. Transfers of metals and metal category compounds reported under code M60 have been included in transfers of metals and metal category compounds to wastewater treatment.

**d** Reported as discharges to POTWs in Section 6.1 of Form R. EPA considers transfers of metals and metal category compounds to POTWs as an off-site release because sewage treatment does not destroy the metal content of the waste material.

**e** Unknown (disposal code M99) indicates that a facility is not aware of the type of waste management used for the toxic chemical that is sent off-site. Amounts reported as unknown transfers are treated as a form of disposal (off-site release).

\* Only fume or dust forms are reportable.

\*\* Except when contained in an alloy.



## Appendix B – TRI Release and Waste Management Data for Metals and Metal Category Compounds, 2001

**Table B-3: Quantities of TRI Metals and Metal Category Compounds in Waste, 2001**

Chemical	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds			
Aluminum* (CAS number 7429-90-5)	5,996,088	21,267,827	0	628	20,598,920	486,721	16,903,098	65,253,282	7,703
Antimony and antimony compounds	10,420,394	3,974,156	0	10,353	114,580	112,958	25,246,003	39,878,444	361,375
Arsenic and arsenic compounds	6,725,411	492,659	0	0	20,476	28,606	380,419,204	387,686,356	1,900,657
Barium and barium compounds	51,471,520	4,771,871	58,814	7,106	7,924,180	648,197	260,990,111	325,871,799	2,088,576
Beryllium and beryllium compounds	118,817	187,648	0	0	0	950	955,232	1,262,647	2,156
Cadmium and cadmium compounds	1,995,002	588,428	0	0	5,577	6,922	15,038,629	17,634,558	221,612
Chromium and chromium compounds	30,022,653	118,170,892	5,052	26,506	2,578,165	1,012,246	130,937,050	282,752,563	2,878,443
Cobalt and cobalt compounds	3,796,493	8,802,867	0	4,167	2,043,007	32,197	16,397,340	31,076,071	107,708
Copper and copper compounds	633,034,067	680,617,091	0	14,433	753,170	1,568,625	1,035,786,000	2,351,773,385	10,227,432
Lead and lead compounds	543,676,921	258,775,082	96,066	119,026	1,259,680	1,002,540	428,651,480	1,233,580,793	18,333,736
Manganese and manganese compounds	36,981,649	127,523,080	3,748	0	965,231	796,221	431,564,230	597,834,158	2,596,769
Mercury and mercury compounds	735,097	161,542	77	2	10,863	37,797	4,873,160	5,818,537	16,014
Nickel and nickel compounds	35,980,641	108,221,042	5,482	3,045	933,690	564,135	78,289,725	223,997,760	1,639,985
Selenium and selenium compounds	760,440	23,157	0	50	327	1,167	10,163,165	10,948,306	66,049
Silver and silver compounds	893,057	3,067,059	0	0	541	1,669	2,850,815	6,813,141	94,897
Thallium and thallium compounds	76,604	7,200	0	0	0	0	3,893,187	3,976,991	16,605
Vanadium** and vanadium compounds	966,733	3,488,085	0	0	95,502	36,540	93,076,738	97,663,598	1,022,342
Zinc* and zinc compounds	90,242,598	310,482,323	140,775	60,468	11,378,587	2,794,434	1,029,743,574	1,444,842,759	6,421,004
<b>Total</b>	<b>1,453,894,184</b>	<b>1,650,622,009</b>	<b>310,014</b>	<b>245,783</b>	<b>48,682,495</b>	<b>9,131,924</b>	<b>3,965,778,738</b>	<b>7,128,665,148</b>	<b>48,003,063</b>

**Note:** Data are from Section 8 of Form R.

\* Only fume or dust forms are reportable.

\*\* Except when contained in an alloy.