
Chapter 4
Toxics Release Inventory Data
for New Industries



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This chapter provides analyses of 2000 TRI data, by industry sector, for the seven industries that were required to report to TRI for the first time in 1998. Analyses of TRI reporting by the 20 industries in the manufacturing sector (Standard Industrial Classification codes 20 to 39) that have been required to report to TRI since the program began in 1987 appear in Chapters 2 and 5. Box 4-1 contains an explanation of SIC codes and their use in TRI.

Chapter 1 explains types of releases and other waste management activities and provides important information on factors to be considered when using TRI data.

Box 4-1: SIC Codes and Their Use in TRI

Standard Industrial Classification (SIC) codes are used throughout the federal government to classify economic activity by industry. Facilities in the manufacturing sectors—that is, SIC codes 20 through 39—have been required to report releases since the TRI program began. Federal facilities have been required to report to TRI since 1994, regardless of their SIC code. In 1998, seven additional industries began reporting.

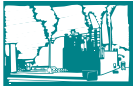
On TRI Form Rs and on TRI Form A certification statements, facilities report the four-digit SIC codes that define their operations. A facility might report, for example, SIC code 2873, nitrogenous fertilizers. Industries are grouped into broader categories at the three-digit and two-digit SIC code levels. For example, at the two-digit level the category nitrogenous fertilizers is in the agricultural chemicals group, SIC code 287, and at the two-digit level it falls into the chemicals and allied products major group, SIC code 28. Producers of nitrogenous fertilizers have been required to report to TRI since 1987. A facility that mines silver ore (SIC code 1044, in the gold and silver ores group SIC code 104, in the metal mining major group SIC code 10) was required to report to TRI beginning in 1998. A solvent recovery facility in SIC code 7389 was also required to report beginning in 1998, although other types of economic activity in that SIC code (miscellaneous business services) do not report to TRI.

Tables in this report present data only for the SIC codes—and the economic activities within those codes—that are specifically required to report to TRI.

Industrial facilities often conduct interrelated operations resulting in products or services that are classified in different SIC codes. In general, TRI forms with multiple SIC codes are analyzed in Chapter 5. (Box 5-2 explains the treatment of multiple codes.) If, however, a facility reported for the first time in 1998 with SIC codes for both new and original industries, it is included in the analyses in Chapter 4 under the new industry code.

NEW INDUSTRIES

As noted in Chapter 1 (under **Who Must Report?** and **Facility Expansion**), in 1992 EPA conducted a detailed examination of non-manufacturing industries to determine which sectors release or otherwise manage significant quantities of TRI chemicals in waste. This effort focused, in particular, on sectors linked to manufacturing—those providing energy, supplying raw materials as inputs, further managing products, or further managing waste from the manufacturing sector. As a result, on May 1, 1997 (in 62 FR 23833), EPA expanded TRI by adding seven new industry sectors, beginning in reporting year 1998:



- Metal mining (SIC code 10, except 1011, 1081, and 1094),
- Coal mining (SIC code 12, except 1241),
- Electric utilities that combust coal and/or oil (SIC codes 4911, 4931, and 4939),
- RCRA subtitle C hazardous waste treatment and disposal facilities (in SIC code 4953),
- Chemical wholesale distributors (SIC code 5169),
- Petroleum terminals and bulk storage facilities (SIC code 5171), and
- Solvent recovery services (in SIC code 7389).

Information and TRI data for RCRA subtitle C hazardous waste treatment and disposal facilities (in SIC code 4953) and solvent recovery services (in SIC code 7389) are presented together because of their similarity.

Chapter 2 presents a comparison of the reporting by the new industries with that of the original industries. In this chapter, total releases include all transfers to disposal as reported by the subset of TRI facilities that reported within the new industry sectors. In Chapter 2, when presenting reporting by all TRI facilities, total releases on- and off-site do not include transfers to disposal sent to other TRI facilities that reported the amount as an on-site release. Some TRI facilities transfer off-site chemicals in waste to other TRI facilities for disposal on-site.

When comparing all TRI facilities, such transfers are omitted to avoid counting the amounts twice, once as a transfer and once as an on-site release. (See Box 1-8 in Chapter 1 and Box 2-1 in Chapter 2 for an explanation and calculation of this duplication of off-site transfers to disposal.) Most of these transfers are from manufacturing facilities in the original industry sectors to hazardous waste facilities, a new industry sector. Therefore, such transfers are not omitted in the separate analyses of the new industries in this chapter.

TRI DATA BY INDUSTRY, 2000

In 2000, a total of 2,132 facilities in the new TRI industries submitted 17,382 forms, comprising 14,731 Form Rs and 2,651 Form As, as shown in Table 4-1. The electric utilities industry submitted the largest number of total forms, 6,210. The petroleum terminals/bulk storage industry ranked second, with 4,096 forms, followed by the chemical wholesale distributors industry, with 3,446 forms. Together, these three industries submitted 79.1 percent of the forms for 2000 from the new industries covered by TRI.

On- and Off-site Releases, 2000

On- and off-site releases by the new industries totaled just over 4.82 billion pounds in 2000. Of that total, the metal mining and electric utilities industries contributed 93.6 percent. As shown in Table 4-2, the metal mining industry reported 3.36 billion pounds of total on- and off-site releases, and the electric utilities industry reported 1.16 billion pounds. These amounts represented 69.6 percent and 23.9 percent, respectively, of all on- and off-site

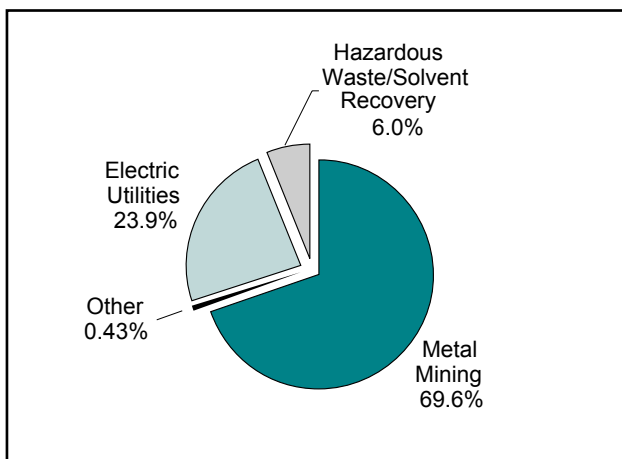
Table 4-1: TRI Facilities and Forms, New Industries, by Industry, 2000

SIC Code	Industry	Total Facilities Number	Total Forms Number	Form Rs Number	Form As Number
10	Metal Mining	97	678	655	23
12	Coal Mining	81	271	203	68
491/493	Electric Utilities	706	6,210	6,038	172
5169	Chemical Wholesale Distributors	467	3,446	1,871	1,575
5171	Petroleum Terminals/Bulk Storage	566	4,096	3,499	597
4953/7389	Hazardous Waste/Solvent Recovery	215	2,681	2,465	216
	Total	2,132	17,382	14,731	2,651

Note: Facilities/forms are included in the original industry category if they did not report a new industry SIC code. Facilities/forms are included in the new industry category if the facility/form has a new industry SIC code and no SIC code in 20-39. If the facility reported in any year prior to 1998 and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the original industry category. If the facility reported for the first time in 1998 or later and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the new industry category.



Figure 4-1: TRI On-site and Off-site Releases, New Industries, by Industry, 2000



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 compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs.

releases reported by the new industries, as illustrated in Figure 4-1. The hazardous waste/solvent recovery industries ranked a distant third, with 289.1 million pounds (6.0 percent) of total on- and off-site releases.

On-site land releases accounted for 79.3 percent (3.83 billion pounds) of the total on- and off-site releases for all new industries combined in 2000. Most on-site land releases (86.7 percent) came from the metal mining industry, which reported 3.32 billion pounds of on-site land releases. (Types of on-site land releases are described in Box 1-4 in Chapter 1.)

The next most common source of releases came from air releases in the electric utilities industry, which accounted for 787.8 million pounds of air emissions, or 16.3 percent of the total on- and off-site releases for all new industries. The electric utilities industry also accounted for 288.9 million pounds of on-site land releases and reported the largest surface water discharges of all new industry sectors, 4.2 million pounds.

The hazardous waste/solvent recovery industries reported the third largest total on- and off-site

releases of the new industry sectors, with 280.1 million pounds. Most of this was on-site land releases to RCRA subtitle C landfills, 196.0 million pounds.

Coal mines reported 16.0 million pounds of total releases, with 13.8 million pounds of on-site land releases and 1.2 million pounds of air emissions. Petroleum terminals and bulk storage facilities reported 3.9 million pounds of total releases, with 3.4 million pounds of air emissions. Chemical wholesale distributors also reported mostly air emissions, with 1.4 million pounds of air emissions out of 1.6 million pounds of total on- and off-site releases.

Figure 4-2 displays the distribution of on- and off-site releases for each of the new industries. Metal mining, coal mining and hazardous waste/solvent recovery reported most of their releases as on-site land releases. On-site land releases were 98.8 percent of their total releases for metal mining, 86.6 percent for coal mining and 71.8 percent for hazardous waste/solvent recovery. On the other hand, the other three new industry sectors reported most of their releases as on-site air emissions. For electric utilities, air emissions were 68.2 percent of their total releases. For chemical wholesale distributors, air emissions were 84.4 percent of total releases and for petroleum terminals and bulk storage facilities, air emissions were 86.6 percent.

Top 15 Chemicals for On- and Off-site Releases by Industry, 2000

Table 4-3 lists the 15 TRI chemicals with the largest total releases in 2000 reported by the metal mining industry. On- and off-site releases of these top 15 TRI chemicals totaled 3.34 billion pounds, 99.3 percent of the total 3.36 billion pounds for all chemicals in the metal mining industry.

The metal mining industry reported 3.33 billion pounds of total on-site releases of the top 15 chemicals. On-site releases constituted just under 100 percent of the total on- and off-site releases of the top 15 chemicals; nearly 619,800 pounds were reported transferred off-site to disposal. Of the 3.33 billion pounds of total on-site releases, 3.29 billion pounds

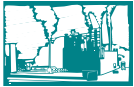


Table 4-2: TRI On-site and Off-site Releases, New Industries, by Industry, 2000

SIC Code	Industry	Air		Surface Water Discharges Pounds	Underground Injection	
		Fugitive or Nonpoint Air Emissions Pounds	Stack or Point Air Emissions Pounds		Class I Wells Pounds	Class II-V Wells Pounds
10	Metal Mining	2,248,967	893,494	492,008	0	37,614,017
12	Coal Mining	1,123,143	60,822	741,153	14,399	208,453
491/ 493	Electric Utilities	314,371	787,505,584	4,206,628	0	0
5169	Chemical Wholesale Distributors	648,971	712,701	4,753	0	0
5171	Petroleum Terminals/Bulk Storage	1,040,998	2,321,185	21,909	0	0
4953/ 7389	Hazardous Waste/Solvent Recovery	359,809	588,387	45,763	33,903,476	0
	Total	5,736,258	792,082,173	5,512,215	33,917,875	37,822,470

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 compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs.

Facilities/forms are included in the original industry category if they did not report a new industry SIC code. Facilities/forms are included in the new industry category if the facility/form has a new industry SIC code and no SIC code in 20-39. If the facility reported in any year prior to 1998 and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the original industry category. If the facility reported for the first time in 1998 or later and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the new industry category.

One facility, Phelps Dodge Miami of Claypool, AZ, that reported under SIC code 33 and SIC code 10 in 2000 and previous years has been included in the new industry category SIC code 10 for the purpose of this analysis.

(98.8 percent) were reported in other on-site land releases (that is, other than RCRA subtitle C landfills). Underground injection into Class II-V Wells was the second-most common reported source for these 15 chemicals, constituting 37.6 million pounds, or 1.0 percent of the total on-site releases.

Copper compounds constituted 37.6 percent (1.26 billion pounds) of the 3.36 billion pounds released on- and off-site by metal mines. Zinc compounds accounted for the second largest total releases, with 21.0 percent (705.7 million pounds) of the total. Arsenic compounds were the third, with 13.5 percent (454.1 million pounds) of the total releases for metal mines.

Table 4-4 lists the 15 TRI chemicals with the largest total releases in 2000 reported by the coal mining industry. On- and off-site releases of these top 15 TRI chemicals totaled 15.5 million pounds, 97.3 percent of the total 16.0 million pounds of all chemicals released on- and off-site by the coal mining industry.

The coal mining industry reported 15.5 million pounds of total on-site releases for the top 15 chem-

icals. No off-site transfers to disposal were reported for these chemicals. Of the 15.5 million pounds of total on-site releases, 13.5 million pounds (86.6 percent) were reported in other on-site land releases (that is, other than RCRA subtitle C landfills). Air emissions were the second most common reported source, constituting 1.1 million pounds, or 7.2 percent of the total on-site releases. Surface water discharges accounted for 4.8 percent (over 740,900 pounds) of the on-site releases.

Barium compounds constituted 32.0 percent (5.1 million pounds) of the 15.9 million pounds released on- and off-site by coal mines. Manganese compounds accounted for the second largest total releases, with 2.4 million pounds or 15.1 percent of the total. Barium was third, with 2.3 million pounds or 14.3 percent of the total. Ammonia constituted 12.6 percent (2.0 million pounds) of the total releases. No other chemical or chemical compound constituted more than 10 percent of the total releases of the coal mining industry.

Table 4-5 lists the 15 TRI chemicals with the largest total releases in 2000 reported by the electric utilities industry. On- and off-site releases of the top 15 TRI chemicals totaled 1.14 billion pounds, 98.6



Table 4-2: TRI On-site and Off-site Releases, New Industries, by Industry, 2000 (continued)

Industry	On-site Land Releases					Total On-site Releases Pounds	Off-site Releases	Total On- and Off-site Releases Pounds
	RCRA Subtitle C Landfills Pounds	Other Landfills Pounds	Land Treatment Pounds	Surface Impoundments Pounds	Other Disposal Pounds		Transfers Off-site to Disposal Pounds	
Metal Mining	0	21,792,594	2,006	886,978,322	2,407,123,486	3,357,144,895	621,752	3,357,766,648
Coal Mining	0	7,785,330	1,921,712	3,120,638	992,332	15,967,981	20	15,968,001
Electric Utilities	1,373,383	143,268,331	2,240,899	137,415,016	4,574,602	1,080,898,816	74,334,647	1,155,233,463
Chemical Wholesale Distributors	0	0	0	0	63,151	1,429,576	183,893	1,613,469
Petroleum Terminals/Bulk Storage	486	0	1,122	101	35,425	3,421,226	460,550	3,881,776
Hazardous Waste/Solvent Recovery	194,611,003	10,730,459	0	2,192,315	18	242,431,230	46,635,855	289,067,085
Total	195,984,872	183,576,714	4,165,739	1,029,706,394	2,412,789,015	4,701,293,724	122,236,717	4,823,530,441

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 compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs.

Facilities/forms are included in the original industry category if they did not report a new industry SIC code. Facilities/forms are included in the new industry category if the facility/form has a new industry SIC code and no SIC code in 20-39. If the facility reported in any year prior to 1998 and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the original industry category. If the facility reported for the first time in 1998 or later and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the new industry category.

One facility, Phelps Dodge Miami of Claypool, AZ, that reported under SIC code 33 and SIC code 10 in 2000 and previous years has been included in the new industry category SIC code 10 for the purpose of this analysis.

percent of the total 1.16 billion pounds of all chemicals released on- and off-site by the electric utilities industry.

The electric utilities industry reported 1.07 billion pounds of total on-site releases of the top 15 chemicals, representing 93.9 percent of the total on- and off-site releases of these top 15 chemicals. Transfers off-site to disposal constituted 6.1 percent (69.4 million pounds) of the total on- and off-site releases

of the top 15 chemicals. Of the 1.07 billion pounds of total on-site releases, 781.8 million pounds (73.1 percent) were air emissions. Other on-site land releases (that is, other than RCRA subtitle C landfills), were the second-most common reported source, constituting 283.1 million pounds, or 26.5 percent of the total on-site releases. Releases in two other categories—surface water discharges, with 3.0 million pounds, and RCRA Subtitle C landfills, with 1.4 million pounds—were also reported.

Table 4-3: Top 15 Chemicals with Largest On-site and Off-site Releases, 2000: Metal Mining

CAS Number	Chemical	Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection		On-site Land Releases		Total On-site Releases Pounds	Off-site Releases Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
				Class I Wells Pounds	Class II-V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds			
--	Copper compounds	127,442	3,767	0	1,300,011	0	1,259,674,891	1,261,106,111	4,174	1,261,110,285
--	Zinc compounds	164,332	25,088	0	22,000,042	0	683,526,085	705,715,547	5,035	705,720,582
--	Arsenic compounds	29,737	4,978	0	1,740,036	0	452,329,034	454,103,785	632	454,104,417
--	Manganese compounds	73,373	80,657	0	1,200,000	0	313,939,515	315,293,545	593,283	315,886,828
--	Lead compounds	159,610	7,162	0	8,300,001	0	299,606,126	308,072,899	5,288	308,078,187
--	Chromium compounds	3,968	255	0	49,000	0	95,924,681	95,977,904	1,028	95,978,932
--	Barium compounds	20,943	27	0	2,000,000	0	63,599,339	65,620,309	9,787	65,630,096
--	Vanadium compounds	1,606	250	0	0	0	43,655,525	43,657,381	0	43,657,381
--	Nickel compounds	8,227	3,212	0	44,005	0	33,440,032	33,495,476	250	33,495,726
--	Antimony compounds	2,275	7,385	0	670,064	0	22,018,570	22,698,294	0	22,698,294
--	Cobalt compounds	1,352	0	0	18,001	0	11,399,763	11,419,116	0	11,419,116
--	Nitrate compounds	260	340,385	0	890	0	4,691,214	5,032,749	5	5,032,754
--	Cadmium compounds	3,070	585	0	110,000	0	4,491,235	4,604,890	271	4,605,161
7440-47-3	Chromium	295	5	0	0	0	4,018,254	4,018,554	0	4,018,554
--	Silver compounds	988	289	0	170,000	0	3,500,780	3,672,057	0	3,672,057
	Subtotal (top 15 chemicals)	597,478	474,045	0	37,602,050	0	3,295,815,044	3,334,488,617	619,753	3,335,108,370
	Total (all chemicals)	3,142,461	492,008	0	37,614,017	0	3,315,896,409	3,357,144,895	621,752	3,357,766,648

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 compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs.

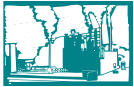
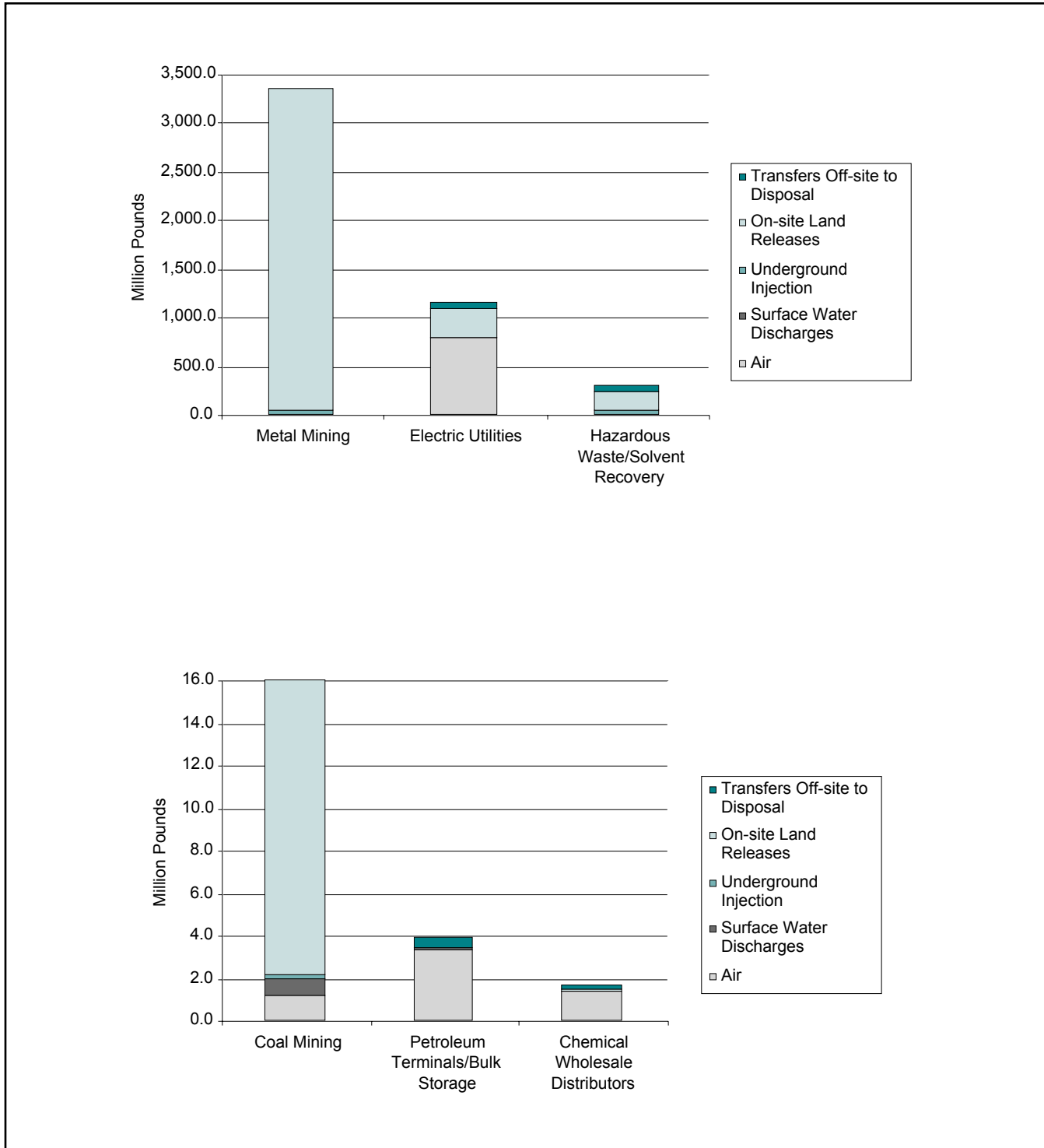


Figure 4-2: Distribution of TRI On-site and Off-site Releases, New Industries, by Industry, 2000



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 compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs.



Table 4-4: Top 15 Chemicals with Largest On-site and Off-site Releases, 2000: Coal Mining

CAS Number	Chemical	Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection		On-site Land Releases		Total On-site Releases Pounds	Off-site Releases Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
				Class I Wells Pounds	Class II-V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds			
--	Barium compounds	430	328	0	99,400	0	5,016,555	5,116,713	0	5,116,713
--	Manganese compounds	232	16,388	0	76,100	0	2,315,862	2,408,582	0	2,408,582
7440-39-3	Barium	0	0	0	0	0	2,284,327	2,284,327	0	2,284,327
7664-41-7	Ammonia	1,112,766	723,229	14,399	0	0	163,869	2,014,263	0	2,014,263
--	Zinc compounds	51	60	0	21,800	0	1,164,266	1,186,177	0	1,186,177
--	Vanadium compounds	36	0	0	0	0	513,828	513,864	0	513,864
--	Lead compounds	9	28	0	0	0	345,022	345,059	0	345,059
--	Copper compounds	16	18	0	0	0	336,206	336,240	0	336,240
--	Nickel compounds	28	34	0	0	0	284,012	284,074	0	284,074
--	Chromium compounds	42	67	0	11,000	0	256,575	267,684	0	267,684
7439-96-5	Manganese	0	2	0	0	0	246,056	246,058	0	246,058
--	Arsenic compounds	5	769	0	0	0	190,253	191,027	0	191,027
7440-66-6	Zinc (fume or dust)	0	0	0	0	0	150,775	150,775	0	150,775
7440-62-2	Vanadium (except when contained in an alloy)	0	0	0	0	0	119,778	119,778	0	119,778
7440-50-8	Copper	0	0	0	0	0	78,265	78,265	0	78,265
Subtotal (top 15 chemicals)		1,113,615	740,923	14,399	208,300	0	13,465,649	15,542,886	0	15,542,886
Total (all chemicals)		1,183,965	741,153	14,399	208,453	0	13,820,012	15,967,981	20	15,968,001

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 compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs.

Hydrochloric acid constituted 51.2 percent (592.0 million pounds) of the 1.16 billion pounds released on- and off-site by the electric utility industry. Barium compounds accounted for the second largest releases, with 200.1 million pounds or 17.3 percent of the total. Sulfuric acid was the third-most common chemical, constituting 10.3 percent (119.4 million pounds) of the total. No other chemical or chemical compound had more than 60 million pounds or constituted more than 10 percent of the total releases for the electric utilities industry.

Table 4-6 lists the 15 TRI chemicals with the largest total releases in 2000 reported by the chemical wholesale distributors industry. On- and off-site releases of the top 15 TRI chemicals totaled 1.4 million pounds, 88.0 percent of the total 1.6 million pounds of all chemicals released on- and off-site by the chemical wholesale distributors industry.

The chemical wholesale distributors industry reported 1.3 million pounds of total on-site releases of the top 15 chemicals, accounting for 90.9 percent of the 1.4 million pounds of total on- and off-site

Table 4-5: Top 15 Chemicals with Largest On-site and Off-site Releases, 2000: Electric Utilities

CAS Number	Chemical	Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection		On-site Land Releases		Total On-site Releases Pounds	Off-site Releases Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
				Class I Wells Pounds	Class II-V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds			
7647-01-0	Hydrochloric acid	591,911,984	47	0	0	0	5	591,912,036	98,911	592,010,947
--	Barium compounds	1,993,304	924,592	0	0	640,025	156,562,502	160,120,423	39,957,237	200,077,660
7664-93-9	Sulfuric acid	119,385,401	6	0	0	0	0	119,385,407	50,000	119,435,407
7664-39-3	Hydrogen fluoride	57,432,540	4,201	0	0	0	51,743	57,488,484	11,500	57,499,984
--	Manganese compounds	466,879	520,982	0	0	115,152	32,070,645	33,173,658	7,349,413	40,523,071
--	Vanadium compounds	2,051,249	284,876	0	0	14,000	22,347,763	24,697,888	4,994,634	29,692,522
--	Zinc compounds	1,201,782	347,026	0	0	78,489	19,729,887	21,357,184	4,368,372	25,725,556
--	Copper compounds	313,037	337,524	0	0	406,807	12,974,209	14,031,577	3,169,685	17,201,262
--	Nickel compounds	666,712	147,193	0	0	27,885	10,219,437	11,061,227	3,026,484	14,087,711
--	Chromium compounds	309,562	110,007	0	0	60,657	10,301,647	10,781,873	2,280,073	13,061,946
--	Lead compounds	144,309	34,853	0	0	0	5,996,732	6,175,894	788,570	6,964,464
--	Arsenic compounds	142,227	156,642	0	0	29,913	5,353,335	5,682,117	1,111,875	6,793,992
7664-41-7	Ammonia	5,416,254	53,484	0	0	0	59,546	5,529,284	329,267	5,858,551
7440-39-3	Barium	291,282	5,266	0	0	0	3,961,847	4,258,395	1,459,182	5,717,577
--	Cobalt compounds	44,570	26,759	0	0	0	3,446,654	3,517,983	370,660	3,888,643
Subtotal (top 15 chemicals)		781,771,092	2,953,458	0	0	1,372,928	283,075,952	1,069,173,430	69,365,863	1,138,539,293
Total (all chemicals)		787,819,955	4,206,628	0	0	1,373,383	287,498,849	1,080,898,816	74,334,647	1,155,233,463

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 compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs.



Table 4-6: Top 15 Chemicals with Largest On-site and Off-site Releases, 2000: Chemical Wholesale Distributors

CAS Number	Chemical	Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection		On-site Land Releases		Total On-site Releases Pounds	Off-site Releases Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
				Class I Wells Pounds	Class II-V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds			
67-56-1	Methanol	277,182	0	0	0	0	2,739	279,921	17,560	297,481
108-88-3	Toluene	136,877	6	0	0	0	6,649	143,532	28,783	172,315
78-93-3	Methyl ethyl ketone	146,409	15	0	0	0	8,297	154,721	11,262	166,983
107-21-1	Ethylene glycol	113,415	2	0	0	0	820	114,237	17,978	132,215
75-09-2	Dichloromethane	104,179	0	0	0	0	3,600	107,779	9,963	117,742
7664-41-7	Ammonia	104,954	1,952	0	0	0	25	106,931	1,011	107,942
75-45-6	Chlorodifluoromethane (HCFC-22)	102,050	0	0	0	0	0	102,050	0	102,050
110-54-3	n-Hexane	79,265	22	0	0	0	5,514	84,801	4,205	89,006
1330-20-7	Xylene (mixed isomers)	66,648	37	0	0	0	3,410	70,095	6,288	76,383
--	Glycol ethers	34,168	4	0	0	0	6,561	40,733	23,541	64,274
108-10-1	Methyl isobutyl ketone	15,977	2	0	0	0	0	15,979	4,318	20,297
79-01-6	Trichloroethylene	13,054	0	0	0	0	2,084	15,138	4,752	19,890
115-07-1	Propylene	19,801	0	0	0	0	0	19,801	0	19,801
108-05-4	Vinyl acetate	18,560	0	0	0	0	0	18,560	31	18,591
74-85-1	Ethylene	15,256	0	0	0	0	0	15,256	0	15,256
Subtotal (top 15 chemicals)		1,247,795	2,040	0	0	0	39,699	1,289,534	129,692	1,419,226
Total (all chemicals)		1,361,672	4,753	0	0	0	63,151	1,429,576	183,893	1,613,469

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 compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs.

releases of these top 15 chemicals. Transfers off-site to disposal constituted 9.1 percent (almost 130,000 pounds) of the total on- and off-site releases of the top 15 chemicals. Of the 1.3 million pounds of total on-site releases, 1.2 million pounds (87.9 percent) were air emissions. Chemical wholesale distributors also reported on-site land releases of 39,700 pounds and surface water discharges of 2,000 pounds for these top 15 chemicals.

Methanol constituted nearly 18.4 percent (297,500 pounds) of the 1.6 million pounds released on- and off-site by the chemical wholesale distributors industry. Toluene was the second most common chemical, constituting 10.7 percent (172,300 pounds) of the total. Methyl ethyl ketone was the third most common chemical, constituting 10.3 percent (166,000 pounds) of the total. No other chemical or chemical compound constituted more than 10 percent of the subtotal.

Table 4-7 lists the 15 TRI chemicals with the largest total releases in 2000 reported by the petroleum terminals/bulk storage industry. On- and off-site releases of the top 15 TRI chemicals totaled 3.8 million pounds, 97.0 percent of the total 3.9 million pounds of all chemicals released on- and off-site by the petroleum terminals/bulk storage industry.

The petroleum terminals/bulk storage industry reported 3.3 million pounds of total on-site releases of the top 15 chemicals. On-site releases comprised 88.0 percent of the total on- and off-site releases of these top 15 chemicals. Transfers off-site to disposal constituted nearly 12.0 percent of the total on- and off-site releases of the top 15 chemicals. Of the 3.3 million pounds of total on-site releases, just under 3.3 million pounds (98.3 percent) were air emissions. On-site land releases were 36,300 pounds and surface water discharges were 21,400 pounds.

Methyl tert-butyl ether constituted nearly 30.0 percent (1.2 million pounds) of the 3.9 million pounds released on- and off-site by the petroleum terminals/bulk storage industry. n-Hexane was the second-most common chemical, constituting 15.3 percent (593,100 pounds) of the total. Toluene was the third-most common chemical, constituting 13.1 percent (509,800 pounds) of the total. No other chemical or chemical compound constituted more than 10 percent of the total releases of the petroleum terminals/bulk storage industry.

Table 4-8 lists the 15 TRI chemicals with the largest total releases in 2000 reported by the hazardous



Table 4-7: Top 15 Chemicals with Largest On-site and Off-site Releases, 2000: Petroleum Terminals/Bulk Storage

CAS Number	Chemical	Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection		On-site Land Releases		Total On-site Releases Pounds	Off-site Releases Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
				Class I Wells Pounds	Class II-V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds			
1634-04-4	Methyl tert-butyl ether	1,123,218	5,581	0	0	0	2,245	1,131,044	29,964	1,161,008
110-54-3	n-Hexane	541,910	4,391	0	0	78	1,942	548,321	44,741	593,062
108-88-3	Toluene	474,798	2,294	0	0	74	8,145	485,311	24,472	509,783
1330-20-7	Xylene (mixed isomers)	282,453	3,025	0	0	0	8,758	294,236	35,786	330,022
71-43-2	Benzene	296,436	3,297	0	0	0	2,326	302,059	14,066	316,125
95-63-6	1,2,4-Trimethylbenzene	146,883	964	0	0	78	3,408	151,333	42,299	193,632
--	Polycyclic aromatic compounds	10,862	747	0	0	81	3	11,693	135,105	146,799
91-20-3	Naphthalene	78,447	281	0	0	89	505	79,322	27,997	107,319
100-41-4	Ethylbenzene	91,678	562	0	0	0	2,081	94,321	10,133	104,454
110-82-7	Cyclohexane	91,729	25	0	0	0	511	92,265	5,894	98,159
107-21-1	Ethylene glycol	1,026	5	0	0	0	500	1,531	73,100	74,631
106-42-3	p-Xylene	40,584	5	0	0	0	0	40,589	0	40,589
67-56-1	Methanol	37,433	0	0	0	0	0	37,433	5	37,438
75-65-0	tert-Butyl alcohol	24,630	266	0	0	0	0	24,896	7,201	32,097
7664-41-7	Ammonia	15,086	0	0	0	0	5,456	20,542	0	20,542
	Subtotal (top 15 chemicals)	3,257,173	21,443	0	0	400	35,880	3,314,896	450,763	3,765,660
	Total (all chemicals)	3,362,183	21,909	0	0	486	36,648	3,421,226	460,550	3,881,776

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 compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs.

waste/solvent recovery industries. On- and off-site releases of the top 15 TRI chemicals totaled 229.6 million pounds, 79.4 percent of the total 289.1 million pounds of all chemicals released on- and off-site by the hazardous waste/solvent recovery industries.

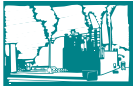
The hazardous waste/solvent recovery industries reported 200.8 million pounds of total on-site

releases of these top 15 chemicals. On-site releases comprised 87.5 percent of the total on- and off-site releases of the top 15 chemicals. Transfers off-site to disposal constituted 12.5 percent of the total on- and off-site releases of the top 15 chemicals. Of the 200.8 million pounds of total on-site releases, 167.5 million pounds (83.4 percent) were to RCRA Subtitle C landfills. Class I Wells were the second most common reported source, constituting 20.8

Table 4-8: Top 15 Chemicals with Largest On-site and Off-site Releases, 2000: Hazardous Waste/Solvent Recovery

CAS Number	Chemical	Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection		On-site Land Releases		Total On-site Releases Pounds	Off-site Releases Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
				Class I Wells Pounds	Class II-V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds			
1344-28-1	Aluminum oxide (fibrous forms)	281	0	8,449	0	41,877,559	488,780	42,375,069	303,408	42,678,477
--	Zinc compounds	6,703	695	311,363	0	22,699,885	214,429	23,233,075	7,218,899	30,451,974
1332-21-4	Asbestos (friable)	284	0	0	0	11,314,434	9,251,616	20,566,334	0	20,566,334
--	Copper compounds	6,939	397	190,005	0	15,537,092	200,983	15,935,416	2,505,652	18,441,068
7440-66-6	Zinc (fume or dust)	3,595	0	0	0	17,363,956	12,873	17,380,424	2,534	17,382,958
--	Barium compounds	6,979	280	0	0	12,614,169	49,684	12,671,112	3,968,981	16,640,093
--	Lead compounds	8,901	775	250	0	10,137,452	377,958	10,525,336	3,349,246	13,874,582
--	Nitrate compounds	262	14,838	10,100,993	0	177,838	1,238,602	11,532,533	947,555	12,480,088
--	Nickel compounds	6,791	1,710	550,250	0	7,817,391	78,613	8,454,755	3,324,460	11,779,215
7439-92-1	Lead	599	6	57,273	0	9,684,423	67,835	9,810,136	1,591,045	11,401,181
--	Chromium compounds	2,756	830	2,000,250	0	3,809,998	174,808	5,988,642	3,382,808	9,371,450
7697-37-2	Nitric acid	2,108	0	7,613,956	0	49,846	87,310	7,753,220	116,871	7,870,091
7429-90-5	Aluminum (fume or dust)	35	0	0	0	5,878,343	123,765	6,002,143	1,517	6,003,660
7439-96-5	Manganese	913	0	0	0	5,208,900	10,601	5,220,414	133,765	5,354,179
--	Arsenic compounds	612	5	750	0	3,377,878	23	3,379,268	1,890,394	5,269,662
	Subtotal (top 15 chemicals)	47,758	19,536	20,833,539	0	167,549,164	12,377,880	200,827,877	28,737,135	229,565,012
	Total (all chemicals)	948,196	45,763	33,903,476	0	194,611,003	12,922,792	242,431,230	46,635,855	289,067,085

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 compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs.



Chapter 4 Toxics Release Inventory Data for New Industries

Table 4-9: TRI Total Releases by State, New Industries, by Industry, 2000

State	Total On- and Off-site Releases						Total New Industries Pounds
	Metal Mining Pounds	Coal Mining Pounds	Electric Utilities Pounds	Chemical Wholesale Distributors Pounds	Petroleum Terminals/Bulk Storage Pounds	Hazardous Waste/Solvent Recovery Pounds	
Alabama	0	154,993	51,818,302	32,919	49,825	21,263,754	73,319,793
Alaska	533,167,944	0	211,400	351	133,136	0	533,512,831
American Samoa	0	0	0	0	0	0	0
Arizona	695,271,494	0	8,855,576	17,624	53,521	1,495,403	705,693,618
Arkansas	0	0	3,505,530	648	9,286	548,979	4,064,443
California	2,634,984	0	561,950	90,808	421,990	32,244,958	35,954,691
Colorado	11,708,422	2,652,207	9,688,202	6,402	44,086	1,196	24,100,516
Connecticut	0	0	1,590,517	9,308	116,805	680,353	2,396,983
Delaware	1,594	0	5,356,467	0	2,392	0	5,360,453
District of Columbia	0	0	53,008	0	0	0	53,008
Florida	0	0	69,205,438	78,244	136,358	2,478	69,422,519
Georgia	0	0	60,424,451	31,081	44,128	6,955	60,506,615
Guam	0	0	204,400	0	19,883	0	224,283
Hawaii	0	0	713,115	5	59,688	0	772,808
Idaho	35,971,429	0	0	0	18,530	15,377,110	51,367,069
Illinois	619,859	3,503,117	30,916,452	80,774	107,697	21,521,110	56,749,009
Indiana	0	857,431	63,737,238	56,404	89,201	6,042,720	70,782,994
Iowa	0	0	9,721,427	114,596	4,694	33	9,840,750
Kansas	0	0	9,403,523	10,877	36,324	207,586	9,658,310
Kentucky	0	4,628	60,075,224	31,509	40,134	625,885	60,777,380
Louisiana	5,148	0	5,929,963	39,222	29,358	13,364,985	19,368,675
Maine	0	0	178,565	6	47,235	0	225,806
Maryland	0	119,048	29,278,070	916	73,665	26	29,471,725
Massachusetts	0	0	6,763,546	82,459	323,173	165,113	7,334,291
Michigan	0	0	50,555,000	28,955	45,954	29,609,970	80,239,879
Minnesota	0	0	12,321,958	13,767	1,340	1,133,426	13,470,491
Mississippi	0	0	16,573,161	3,575	104,452	11	16,681,199
Missouri	46,960,403	0	25,451,217	78,195	49,030	855	72,539,700
Montana	58,585,032	8,122	11,680,643	3,839	7,011	0	70,284,647
Nebraska	0	0	8,598,475	0	0	318,002	8,916,477
Nevada	1,000,588,229	0	2,509,254	255	2,339	768,383	1,003,868,460
New Hampshire	0	0	3,276,839	605	28,408	0	3,305,851
New Jersey	0	0	9,377,566	142,523	295,800	750,714	10,566,603
New Mexico	113,937,471	5,082,219	7,745,494	7,932	5,539	4,686	126,783,342
New York	24,636	0	24,041,441	15,416	238,128	5,828,026	30,147,647
North Carolina	0	0	94,951,361	103,963	76,141	309,128	95,440,592
North Dakota	0	140,144	21,829,198	2,114	0	0	21,971,456
Northern Marianas	0	0	0	0	7,990	0	7,990
Ohio	0	4,733	104,014,521	89,390	86,541	42,027,539	146,222,725
Oklahoma	0	0	4,182,892	16,259	37,151	5,087,642	9,323,944
Oregon	0	0	279,904	16,457	29,672	54,843,198	55,169,231
Pennsylvania	0	244,611	80,630,197	57,582	205,244	5,539,717	86,677,351
Puerto Rico	0	0	12,110,534	11,400	24,874	66,750	12,213,558
Rhode Island	0	0	27,448	500	48,370	500	76,818
South Carolina	0	0	20,280,547	20,709	6,314	14,596	20,322,166
South Dakota	3,660,849	0	1,967,139	0	0	0	5,627,988
Tennessee	21,190,397	0	42,598,170	43,825	30,894	52,013	63,915,298
Texas	41,621	0	36,584,463	215,148	490,415	19,527,731	56,859,377
Utah	833,058,670	1	7,890,368	7,335	6,388	8,919,897	849,882,659
Vermont	0	0	0	0	0	0	0
Virgin Islands	0	0	29,175	0	1,999	0	31,174
Virginia	0	9,600	24,080,132	28,338	99,812	184,335	24,402,217
Washington	338,466	0	4,752,744	3,135	51,307	515,633	5,661,284
West Virginia	0	3,187,148	76,983,296	1,034	12,186	18	80,183,682
Wisconsin	0	0	11,708,271	17,065	20,390	15,669	11,761,396
Wyoming	0	0	10,009,691	0	6,980	0	10,016,671
Total	3,357,766,648	15,968,001	1,155,233,463	1,613,469	3,881,776	289,067,085	4,823,375,448

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 compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs.

Facilities/forms are included in the original industry category if they did not report a new industry SIC code. Facilities/forms are included in the new industry category if the facility/form has a new industry SIC code and no SIC code in 20-39. If the facility reported in any year prior to 1998 and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the original industry category. If the facility reported for the first time in 1998 or later and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the new industry category.



million pounds, or 10.4 percent of the total on-site releases.

Aluminum oxide (fibrous forms) constituted 14.8 percent (42.7 million pounds) of the 289.1 million pounds of chemicals released on- and off-site by the hazardous waste/solvent recovery industries. Zinc compounds had the second largest total releases, with 30.5 million pounds or 10.5 percent of the total. Asbestos (friable), copper compounds, zinc (fume or dust), and barium compounds had between 16 and 21 million pounds of releases, but none constituted more than 10 percent of the total releases of the hazardous waste/solvent recovery industries.

Total Releases by State, 2000

As Table 4-9 demonstrates, the geographic distribution of TRI chemical releases for the new industries is heavily concentrated in a few states. Four states—Nevada, Utah, Arizona, and Alaska—had total on- and off-site releases of over 500.0 million pounds. Nevada ranked first with 1.0 billion pounds, or 20.8 percent of the total for all states. Utah ranked second with 849.9 million pounds, or 17.6 percent of the total. Arizona ranked third with 705.7 million pounds, or 14.6 percent of the total. Alaska ranked fourth with 533.5 million pounds, or 11.1 percent of the total. Together, these four states accounted for 64.1 percent of the total on- and off-site releases reported in all states. The metal mining industry accounted for 99.0 percent of these four states' total on- and off-site releases.

The electric utilities industry in Ohio reported the largest total releases for this industry, with 104.0 million pounds or 9.0 percent of total releases by the electric utilities industry. The hazardous waste/solvent recovery industries in Oregon reported the largest total releases for these industries, with 54.8 million pounds or 19.0 percent of total releases by the hazardous waste/solvent recovery industries.

Ninety percent of the total releases by the coal mining industry occurred in four states: New Mexico with 5.1 million pounds, Illinois with 3.5 million pounds, West Virginia with 3.2 million pounds and Colorado with 2.7 million pounds.

Texas was the state with the largest total releases by both the chemical wholesale distributors and the petroleum terminals/bulk storage industries. Chemical wholesale distributors in Texas reported 215,100 pounds of total releases (13.3 percent of the total for this industry) and petroleum terminals and bulk storage facilities in Texas reported 490,400 pounds of total releases (12.6 percent of the total for this industry).

Waste Management Data, 2000

Quantities of TRI Chemicals in Waste Managed, 2000

As shown in Table 4-10 and Figure 4-3, facilities in the new industries reported a total of 6.15 billion pounds of TRI chemicals in waste managed in 2000. Of the total production-related waste managed by the new industries, just under 4.60 billion pounds (74.7 percent) were reported released on- and off-site. On-site treatment was the next most common method of waste management, accounting for 1.00 billion pounds (16.3 percent) of the total. Together, these two methods represented 91.1 percent of the total production-related waste managed.

The metal mining industry reported managing 3.43 billion pounds of total production-related waste in 2000, 55.8 percent of the total for all industries combined. Nearly 91.5 percent (3.14 billion pounds) of the metal mining industry's production-related waste was released on- and off-site. On-site treatment, the metal mining industry's second-most common waste management method, accounted for 7.5 percent (258.8 million pounds) of the industry's production-related waste.

The electric utilities industry ranked second among new industries for total production-related waste managed, with 1.64 billion pounds, or 26.7 percent of the total for all new industries. On- and off-site releases accounted for 1.15 billion pounds (70.2 percent) of the electric industry's production-related waste. Electric utilities reported 481.7 million pounds (29.4 percent) of the industry's waste treated on-site, the largest total of any new industry.

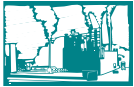


Table 4-10: Quantities of TRI Chemicals in Waste Managed, New Industries, by Industry, 2000

SIC Code	Industry	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			
10	Metal Mining	32,398,053	2,042,398	0	0	258,763,697	166,274	3,138,140,726	3,431,511,148	219,374,009
12	Coal Mining	35,718	7,774	0	0	358,555	0	15,985,805	16,387,852	2,646,699
491/493	Electric Utilities	94,645	7,231,764	25,745	13,607	481,671,522	370,726	1,150,350,804	1,639,758,814	328,780
5169	Chemical Wholesale Distributors	7,548,921	153,469	0	9,957,310	574,681	3,028,130	1,517,566	22,780,077	170,919
5171	Petroleum Terminals/Bulk Storage	27,082,736	1,729,889	34,706	123,547	7,176,661	441,525	3,976,827	40,565,892	86,622
4953/7389	Hazardous Waste/Solvent Recovery	128,391,137	22,011,626	6,985,191	256,029,724	254,270,231	43,726,873	289,719,497	1,001,134,279	1,498,318
	Total	195,551,210	33,176,920	7,045,642	266,124,188	1,002,815,347	47,733,528	4,599,691,226	6,152,138,062	224,105,347

Note: Data are from Section 8 of Form R.

Facilities/forms are included in the original industry category if they did not report a new industry SIC code. Facilities/forms are included in the new industry category if the facility/form has a new industry SIC code and no SIC code in 20-39. If the facility reported in any year prior to 1998 and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the original industry category. If the facility reported for the first time in 1998 or later and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the new industry category.

The hazardous waste/solvent recovery industries reported the third-largest total production-related waste managed among the new industries, with 1.00 billion pounds. Like the two leading industries, the hazardous waste/solvent recovery industries reported the highest volume of waste handled through on- and off-site releases—289.7 million pounds. But the hazardous waste/solvent recovery industries’ ratio of on- and off-site releases was lower: 28.9 percent. The quantity released on- and off-site by the hazardous waste/solvent recovery industries was just slightly higher than its off-site energy recovery (25.6 percent, or 256.0 million pounds) and on-site treatment (25.4 percent, or 254.3 million pounds).

Of the other three industries—coal mining, chemical wholesale distributors, and petroleum terminals/bulk storage—none reported managing more than about 40 million pounds of total production-related waste. The petroleum terminals/bulk storage industry reported 40.6 million pounds, with 27.1 million pounds recycled on-site. The chemical wholesale distributors industry reported 22.8 million pounds of production-related waste managed, with 10.0 million pounds of off-site energy recovery and 7.5 million pounds of on-site recycling. The coal mining industry reported 16.4 million pounds, with 16.0 million pounds released on- and off-site.

Transfers Off-site for Further Waste Management/Disposal, 2000

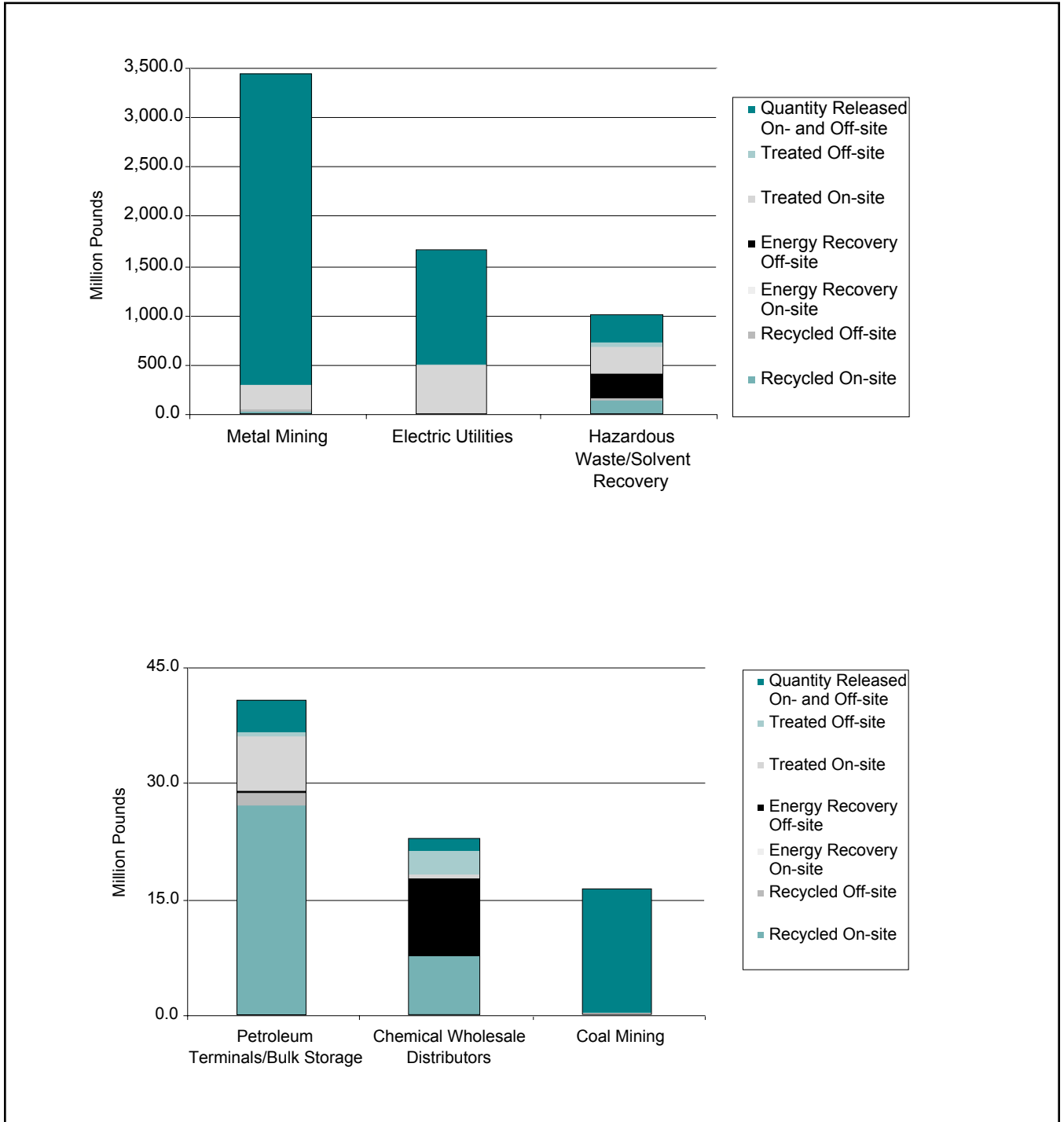
As shown in Table 4-11, the new industries transferred a total of 453.1 million pounds of TRI waste for further waste management and disposal in 2000. The hazardous waste/solvent recovery industries accounted for 78.3 percent (354.8 million pounds) of the combined total transfers for all new industries. Within the hazardous waste/solvent recovery industries, 69.7 percent (247.2 million pounds) of transfers for further waste management and disposal were transfers to energy recovery, while other transfers off-site to disposal accounted for 13.1 percent (46.6 million pounds) of the industries’ total.

The electric utilities industry accounted for the next highest share—17.2 percent (78.0 million pounds)—of the combined total for all industries. Of the electric utilities industry’s total off-site transfers, 95.4 percent (74.3 million pounds) came from other transfers off-site to disposal, and 4.6 percent (3.6 million pounds) from transfers to recycling.

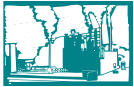
The chemical wholesale distributors industry reported 13.9 million pounds, 3.1 percent of the total transfers off-site for further waste management and disposal. Of those 13.9 million pounds, 10.5 million pounds were transfers to energy recovery and 3.0 million pounds were transfers to treatment. The petroleum terminals/bulk storage industry



Figure 4-3: Distribution of Quantities of TRI Chemicals in Waste Managed, New Industries, 2000



Note: Data are from Section 8 of Form R.



reported 3.7 million pounds of transfers off-site for further waste management and disposal with 2.7 million pounds as transfers to recycling. The coal mining industry reported almost 7,800 pounds, almost all of which was transfers to recycling.

Of the 453.1 million pounds of transfers off-site for further waste management and disposal by the new industries, 56.9 percent (257.9 million pounds) was managed through transfers to energy recovery, nearly 27.0 percent (122.2 million pounds) through other transfers off-site to disposal, and 8.7 percent (39.3 million pounds) through transfers to treatment. The hazardous waste/solvent recovery industries accounted for 247.2 million pounds of the total (257.9 million pounds) managed through transfers to energy recovery, and chemical wholesale distributors accounted for 10.5 million pounds. Of the 122.2 million pounds of other transfers off-site to disposal, the second most-common management category, the electric utilities industry accounted for 74.3 million pounds and hazardous waste/solvent recovery accounted for 46.6 million pounds of the total.

Projected Quantities of TRI Chemicals Managed in Waste, 2000-2002

As described in **Waste Management** in Chapter 1, on each Form R that it submits, a facility reports actual waste management quantities for the current and prior years and projected quantities for the next two years. Table 4-12 outlines the current and projected quantities of TRI chemicals in waste in the new industries. In 2000, the new industries reported 6.15 billion pounds and projected totals of nearly 5.60 billion pounds for 2001 and just over 5.60 billion pounds for 2002. Those projections represent a 9.0 percent decrease from 2000 to 2001 and an 8.8 percent decrease from 2000 to 2002.

All new industries anticipated declines for the period 2000 to 2001, for a combined projected decline of 553.3 million pounds. The largest net reductions in this period were projected to come from the metal mining industry, which estimated a decline of 400.9 million pounds, and from the hazardous waste/solvent recovery industries, which anticipated a decline of 135.9 million pounds.

Table 4-11: TRI Transfers Off-site for Further Waste Management/Disposal, New Industries, by Industry, 2000

SIC Code	Industry	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs		Other Off-site Transfers* Pounds	Other Transfers Off-site to Disposal**	Total Transfers for Further Waste Management/Disposal Pounds
					Metals and Metal Compounds Pounds	Non-metal TRI Chemicals Pounds			
10	Metal Mining	2,192,086	0	309	4,203	25,500	0	617,549	2,839,648
12	Coal Mining	7,774	0	0	0	0	0	20	7,794
491/493	Electric Utilities	3,584,107	13,612	19,759	4,844	1,661	124	74,329,803	77,953,910
5169	Chemical Wholesale Distributors	157,674	10,480,663	2,991,926	68	41,609	1,421	183,825	13,857,186
5171	Petroleum Terminals/Bulk Storage	2,669,945	134,437	386,745	306	12,195	0	460,244	3,663,873
4953/ 7389	Hazardous Waste/Solvent Recovery	21,798,187	247,231,181	35,886,539	31,127	3,264,835	5,205	46,604,727	354,821,801
	Total	30,409,774	257,859,893	39,285,277	40,549	3,345,800	6,750	122,196,168	453,144,211

Note: Total Transfers Off-site for Further Waste Management/Disposal are from Section 6 of Form R.

Facilities/forms are included in the original industry category if they did not report a new industry SIC code. Facilities/forms are included in the new industry category if the facility/form has a new industry SIC code and no SIC code in 20-39. If the facility reported in any year prior to 1998 and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the original industry category. If the facility reported for the first time in 1998 or later and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the new industry category.

* Other Off-site Transfers are transfers reported without a valid waste management code.

** Does not include transfers to POTWs of metals and metal compounds.



Table 4-12: Current Year and Projected Quantities of TRI Chemicals in Waste, New Industries, by Industry, 2000-2002

SIC Code	Industry	Total Production-related Waste Managed				
		Current Year 2000 Pounds	Projected		Change 2000-2001 Percent	Change 2000-2002 Percent
			2001 Pounds	2002 Pounds		
10	Metal Mining	3,431,511,148	3,030,602,245	3,043,839,410	-11.7	-11.3
12	Coal Mining	16,387,852	15,313,768	15,308,533	-6.6	-6.6
491/493	Electric Utilities	1,639,758,814	1,628,898,494	1,635,677,851	-0.7	-0.2
5169	Chemical Wholesale Distributors	22,780,077	18,599,295	18,544,491	-18.4	-18.6
5171	Petroleum Terminals/Bulk Storage	40,565,892	40,169,991	40,679,043	-1.0	0.3
4953/7389	Hazardous Waste/Solvent Recovery	1,001,134,279	865,214,526	854,024,229	-13.6	-14.7
	Total	6,152,138,062	5,598,798,319	5,608,073,557	-9.0	-8.8

Note: Data are from Section 8 (Total of 8.1 through 8.7) of Form R for 2000. Current Year is Column B, 2001 is Column C and 2002 is Column D.

For 2002, all new industries projected reductions from their 2000 totals except for the petroleum terminals/bulk storage industry, which anticipated a slight increase of just over 113,200 pounds. The largest net decrease was projected to come from the metal mining industry, which anticipated managing 3.04 billion pounds of total production related waste in 2002, 11.3 percent (387.7 million pounds) less than in 2000. The next largest net reduction was projected by the hazardous waste/solvent recovery industries, which expected to handle 854.0 million pounds of waste in 2000—147.1 million pounds (14.7 percent) less than in 2000.

Source Reduction, 2000

As shown in Table 4-13, the new industries submitted 14,731 Form Rs, 8.8 percent (1,296) of which reported source reduction activities.

The hazardous waste/solvent recovery industries had the highest ratio of forms reporting source reduction activity (14.2 percent), followed by the chemical wholesale distributors industry (12.7 percent), the electric utilities industry (8.2 percent), the petroleum terminals/bulk storage industry (5.4 percent), and the metal mining industry (3.7 percent). The coal mining industry reported no source reduction activities.

Good operating practices, reported on 956 forms, accounted for the largest number of source reduction activities reported by the new industries. This was true for each of the new industries except for metal mining, where process modifications were most often reported. Spill and leak prevention was the second most often reported source reduction activity for all new industries, with 476 forms.

Table 4-13: Number of Forms Reporting Source Reduction Activity, New Industries, by Industry, 2000

SIC Code	Industry	Total Form Rs Number	Forms Reporting Source Reduction Activity		Category of Source Reduction Activity							
			Number	Percent of All Form Rs Percent	Good Operating Practices Number	Inventory Control Number	Spill and Leak Prevention Number	Raw Materials Modifi- cations Number	Process Modifi- cations Number	Cleaning and Degreasing Number	Surface Preparation and Finishing Number	Product Modifi- cations Number
10	Metal Mining	655	24	3.7	4	1	4	0	14	0	0	1
12	Coal Mining	203	0	0.0	0	0	0	0	0	0	0	0
491/493	Electric Utilities	6,038	497	8.2	344	63	41	96	61	0	0	1
5169	Chemical Wholesale Distributors	1,871	237	12.7	143	36	130	11	30	24	0	2
5171	Petroleum Terminals/Bulk Storage	3,499	188	5.4	100	26	160	0	48	16	0	7
4953/7389	Hazardous Waste/Solvent Recovery	2,465	350	14.2	365	0	141	0	34	0	0	3
	Total	14,731	1,296	8.8	956	126	476	107	187	40	0	14

Note: All source reduction activities on a form are counted in the corresponding category. Totals do not equal the sum of the categories because forms may report more than one source reduction activity.



Process modifications followed with 187 forms, and inventory controls were reported on 126 forms.

1998-2000 TRI DATA

Comparisons of TRI data across reporting years are made on the basis of chemicals that were reportable in all years with the same reporting definitions. This ensures that apparent increases or decreases from one year to another are not the result of changes in the list of TRI chemicals. **Making Year-to-Year Comparisons of TRI Data**, in Chapter 1, explains these multiyear analyses; an understanding of these issues is essential for accurate interpretation of the multiyear data presented in this chapter.

Progress in reducing releases and quantities of TRI chemicals in wastes for the new industry sectors can be assessed from 1998 since that is the first year they were required to report to TRI. Comparisons of on-site and off-site releases are also made only for chemicals that were reportable with the same definition in the years 1998 to 2000. Such comparisons exclude the PBT chemicals and vanadium and vanadium compounds since these chemicals were either added to the TRI list in 2000 or their reporting definition or reporting threshold was changed in 2000. See Chapter 3 for an explanation

of reporting threshold changes and the PBT chemicals.

On- and Off-site Releases, 1998-2000

Table 4-14 compares the number of TRI forms submitted by the new industries and the new industries' total on- and off-site releases for the years 1998-2000. The new industries submitted a total of 14,349 forms in 2000, down from 15,001 in 1998 and 14,572 in 1999—declines of 4.3 percent from 1998-2000 and 1.5 percent from 1999-2000. The metal mining industry had the largest percentage decline in this period as it submitted 761 forms in 1998, 686 in 1999, and 599 in 2000—a decline of 21.3 percent from 1998-2000. Only the coal mining industry increased the number of forms submitted, from 188 in 1998, to 202 in 1999, to 212 in 2000. In each of the three years, electric utilities submitted the largest number of forms (4,241 in 2000), followed by petroleum terminals/bulk storage (3,510 in 2000), chemical wholesale distributors (3,440 in 2000), hazardous waste/solvent recovery (2,347 in 2000), metal mining (599 in 2000), and coal mining (212 in 2000).

Table 4-14: TRI Forms and Total Releases, New Industries, by Industry, 1998-2000

SIC Code	Industry	Total Forms					Total On- and Off-site Releases				
		1998 Number	1999 Number	2000 Number	Change 1999-2000 Percent	Change 1998-2000 Percent	1998 Pounds	1999 Pounds	2000 Pounds	Change 1999- 2000 Percent	Change 1998- 2000 Percent
10	Metal Mining	761	686	599	-12.7	-21.3	3,563,214,115	3,866,025,389	3,310,957,754	-14.4	-7.1
12	Coal Mining	188	202	212	5.0	12.8	13,392,904	10,737,088	15,327,860	42.8	14.4
491/493	Electric Utilities	4,304	4,186	4,241	1.3	-1.5	1,130,899,996	1,160,317,399	1,123,370,213	-3.2	-0.7
5169	Chemical Wholesale Distributors	3,623	3,526	3,440	-2.4	-5.1	1,551,730	2,002,363	1,613,469	-19.4	4.0
5171	Petroleum Terminals/Bulk Storage	3,769	3,568	3,510	-1.6	-6.9	4,525,712	4,345,041	3,728,840	-14.2	-17.6
4953/7389	Hazardous Waste/Solvent Recovery	2,356	2,404	2,347	-2.4	-0.4	280,263,611	279,801,143	285,854,490	2.2	2.0
	Total	15,001	14,572	14,349	-1.5	-4.3	4,993,848,068	5,323,228,423	4,740,852,625	-10.9	-5.1

Note: Does not include PBT chemicals, vanadium and vanadium compounds. **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 compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs.

Facilities/forms are included in the original industry category if they did not report a new industry SIC code. Facilities/forms are included in the new industry category if the facility/form has a new industry SIC code and no SIC code in 20-39. If the facility reported in any year prior to 1998 and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the original industry category. If the facility reported for the first time in 1998 or later and the facility/form has a combination of original and new industry SIC codes, then the facility/form is included in the new industry category.



Meanwhile, total on- and off-site releases have moved up and down in the period 1998-2000. In 1998, the new industries reported just under 5.00 billion pounds of total on- and off-site releases. Releases rose to 5.32 billion pounds in 1999 before falling back down to 4.74 billion pounds in 2000—a net decline of 5.1 percent from 1998-2000.

The largest absolute reduction came from the metal mining industry, which reported a decrease in total on- and off-site releases of 7.1 percent, from 3.56 billion pounds in 1998 to 3.31 billion pounds in 2000, a net decline of 252.3 million pounds. The change from 1999 to 2000 for the metal mining industry was a reduction of 14.4 percent from 3.87 million pounds to 3.31 million pounds.

The next largest absolute reduction came from the electric utilities industry, which cut total on- and off-site releases by 0.7 percent, from 1.13 billion pounds in 1998 to 1.12 billion pounds in 2000, a net decline of 7.5 million pounds. The reduction from 1999 to 2000 for the electric utilities industry was 3.2 percent, from 1.16 million pounds to 1.12 million pounds.

The petroleum terminals/bulk storage industry reported the largest percentage reduction, of 17.6 percent from 4.5 million pounds in 1998 to 3.7 million pounds in 2000.

The other three new industries reported increases over the period 1998-2000. Coal mining reported the largest percentage increase, of 14.4 percent from 13.4 million pounds to 15.3 million pounds. Although coal mines did report an overall decrease from 1998 to 1999, the increase from 1999 to 2000 was 42.8 percent. Chemical wholesale distributors reported an increase of 4.0 percent from 1998 to 2000, from 1.55 million pounds to 1.61 million pounds. This industry did report a net reduction of 19.4 percent from 1999 to 2000. The hazardous waste/solvent recovery industries reported an overall increase of 2.0 percent from 1998 to 2000, from 280.3 million pounds to 285.9 million pounds, after a reduction from 1998 to 1999.

Waste Management Data, 1998-2000

As shown in Table 4-15, total production-related waste managed by the new industries fell from 6.56 billion pounds in 1998 to 6.05 billion pounds in 2000, a 7.8 percent decrease. Overall, the industries reported reducing total production-related waste by 513.5 million pounds from 1998 to 2000. The metal mining industry reported the largest absolute decline—448.0 million pounds from 1998 to 2000, an 11.7 percent reduction. The hazardous waste/solvent recovery industries reported the next largest decline—80.4 million pounds from 1998 to 2000, a 7.6 percent decline. The third-largest decline came in the chemical wholesale distributors industry,

Table 4-15: Total Production-related Waste Managed, New Industries, by Industry, 1998-2000

SIC Code	Industry	Total Production-related Waste Managed						
		1998 Pounds	1999 Pounds	2000 Pounds	Change 1999-2000		Change 1998-2000	
					Pounds	Percent	Pounds	Percent
10	Metal Mining	3,835,861,814	3,651,497,908	3,387,839,621	-263,658,287	-7.2	-448,022,193	-11.7
12	Coal Mining	13,891,064	11,123,938	15,748,237	4,624,299	41.6	1,857,173	13.4
491/493	Electric Utilities	1,532,979,280	1,566,344,845	1,599,427,067	33,082,222	2.1	66,447,787	4.3
5169	Chemical Wholesale Distributors	55,686,659	41,731,876	22,780,075	-18,951,801	-45.4	-32,906,584	-59.1
5171	Petroleum Terminals/Bulk Storage	60,882,666	49,557,284	40,401,448	-9,155,836	-18.5	-20,481,218	-33.6
4953/ 7389	Hazardous Waste/Solvent Recovery	1,063,282,574	996,293,889	982,890,749	-13,403,140	-1.3	-80,391,825	-7.6
	Total	6,562,584,057	6,316,549,740	6,049,087,197	-267,462,543	-4.2	-513,496,860	-7.8

Note: Does not include PBT chemicals, vanadium and vanadium compounds. Data are from Section 8 (total of 8.1 through 8.7) of Form R of year indicated.



which reported a 59.1 percent decline (32.9 million pounds). Petroleum bulk terminals reported a 20.5 million pound reduction from 1998 to 2000.

The electric utilities industry and the coal mining industry both reported increases in total production-related waste managed from 1998 to 2000—increases of 66.4 million pounds (4.3 percent) and 1.9 million pounds (13.4 percent), respectively. The increases in these industries were recorded both from 1998 to 1999 and from 1999 to 2000.

The trajectory of decreases and increases have held steady year-to-year in each industry as every new industry but coal mining and electric utilities reduced the amount of total production-related waste they managed. From 1999 to 2000, the new industries decreased production-related waste by 267.5 million pounds, or 4.2 percent. The largest absolute decline came from the metal mining industry, which trimmed production-related waste by 263.7 million pounds or 7.2 percent. The chemical wholesale distributors industry had the next largest absolute decline—just under 19.0 million pounds, or 45.4 percent. The hazardous waste/solvent recovery industries reported the third-largest decline—13.4 million pounds, or 1.3 percent.

The electric utilities industry reported an increase in total production-related waste of 33.1 million pounds from 1999 to 2000, a 2.1 percent increase. The coal mining industry reported an increase of 4.6 million pounds, a 41.6 percent increase, from 1999 to 2000.