Toxics Release Inventory 1999

Executive Summary

Background

The Toxics Release Inventory (TRI) is a publicly available database containing information on toxic chemical releases and other waste management activities that are reported annually by manufacturing facilities and facilities in certain other industry sectors, as well as by federal facilities. This inventory was established under the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) which was enacted to promote emergency planning, to minimize the effects of chemical accidents, and to provide the public with information on releases of toxic chemicals in their communities.

There are now nearly 650 toxic chemicals and chemical compounds on the list of chemicals that must be reported to EPA and the states under the EPCRA/TRI Program. Facilities must report the quantity of each chemical that they release into each media—air, water, and land—each year. In addition, with the passage of the Pollution Prevention Act (PPA) in 1991, facilities must report other waste management amounts including the quantities of TRI chemicals recycled, combusted for energy recovery, and treated on- and off-site. This other waste management data has strengthened TRI as a tool for providing information on facilities' handling of TRI chemicals, as well as for analyzing progress in reducing releases.

A facility must report to TRI if it meets the following three criteria:

- Conducts manufacturing operations within Standard Industrial Classification (SIC) codes 20 through 39 and, beginning in the 1998 reporting year, if it falls under one of the following industry categories: metal mining, coal mining, electric utilities that combust coal and/or oil (hereafter referred to as electric generating facilities), chemical wholesale distributors, petroleum terminals and bulk storage facilities, RCRA Subtitle C treatment, storage, and disposal (TSD) facilities, and solvent recovery services. Federal facilities must also report to TRI regardless of their SIC code classification;
- Has 10 or more full-time employee equivalents, and
- Manufactures or processes more than 25,000 pounds or otherwise uses more than 10,000 pounds of any listed chemical during the calendar year.

The TRI data are used in many ways: by citizens and community groups seeking information to assess local environmental conditions, by industries which are analyzing the environmental performance and

efficiency of their processes, by investors who wish to compare companies' environmental records, and many other users who are attempting to assess local, regional, and national environmental conditions.

1999 Data Release

The time period covered by the 1999 data release is the reporting year 1999. A reporting year is equal to a calendar year. The 1999 data, which were submitted to EPA by July 1, 2000, are the focus of the *1999 Toxics Release Inventory Public Data Release* (the Public Data Release report). Compiled here is an analysis of the 1999 TRI data and trends in the data from 1988 to 1999.

The 1998 and 1999 data include reporting by the "original" industries (the manufacturing sector, which has been reporting since 1987, and federal facilities, which have been reporting since 1994), as well as the "new" industries, which have been reporting since 1998.

The analysis of trends in the TRI data from 1988 to 1999 only includes the "original"

Table E–1. TRI On-site and Off-site Releases by Industry, Original and New Industries, 1999

				On-site Releases								
						Underground Injection		On-site Land Releases			Off-site Releases	
SIC Code	Industry	Total Facilities Number	Total Forms Number	Total Air Emissions Pounds	Surface Water Discharges Pounds	Class I Wells Pounds	Class II–V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds	Total On-site Releases Pounds	Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
20–39	Original Industries	20,698	69,471	1,175,054,932	253,591,816	199,398,335	149,468	12,440,355	311,227,496	1,951,862,402	374,647,596	2,326,509,998
10	Metal Mining	108	692	4,452,614	447,029	0	35,092,409	0	3,934,845,946	3,974,837,998	2,178,868	3,977,016,866
12	Coal Mining	50	205	1,771,548	235,267	0	143,700	0	9,608,323	11,758,838	0	11,758,838
491/493	Electric Generating Facilities	625	4,225	841,919,820	4,510,038	0	5	1,298,989	256,822,151	1,104,551,003	57,958,243	1,162,509,246
5169	Chemical Wholesale Distributors	428	3,459	1,318,395	3,344	0	0	0	1,281	1,323,020	648,639	1,971,659
5171	Petroleum Terminals and Bulk Storage Facilities	532	3,568	4,044,223	43,606	0	0	528	14,641	4,102,998	165,553	4,268,551
4953/7389	RCRA Subtitle C TSD and Solvent Recovery Facilities	198	2,448	802,891	50,676	22,861,227	0	206,756,050	13,707,014	244,177,858	43,824,555	288,002,413
	Total	**22,639**	**84,068**	**2,029,364,423**	**258,881,776**	**222,259,562**	**35,385,582**	**220,495,922**	**4,526,226,852**	**7,292,614,117**	**479,423,454**	**7,772,037,571**

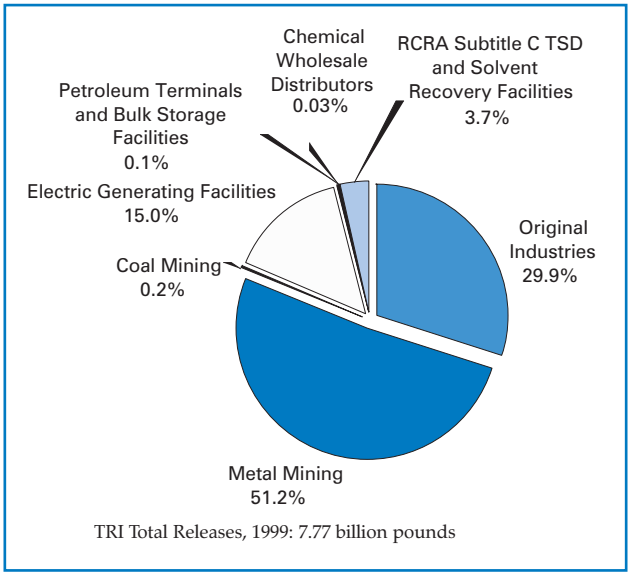
Note: On-site Releases are from Section 5 of Form R. **Off-site Releases** are from Section 6 (transfers off-site to disposal) of Form R. **Off-site Releases** include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. **Off-site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

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 Inc. in Claypool, AZ, that reported under SIC code 33 and SIC code 10 in 1999 and previous years has been included in the new industry category SIC code 10 for the purpose of this analysis.

Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, reporting in the original industry sector were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change the facility's off-site transfers to disposal amounts for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising off-site transfers to disposal for manganese compounds from 5,584,900 pounds to below 500 pounds.

Figure E–1. TRI Total Releases by Industry, Original and New Industries, 1999



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industries and those listed chemicals that have been reportable since 1988. Year-to-year comparisons must be based on a consistent set of chemicals and reporting industries to ensure that any changes in releases or other waste management data do not simply reflect changes in reporting requirements from year to year.

Total On-site and Off-site Releases, 1998–1999

In 1999, 22,639 facilities submitted 84,068 forms. On- and off-site releases for all TRI industries totaled 7.77 billion pounds for that year. The original industries accounted for 30 percent of this total. Among the new industries, metal mining accounted for 51 percent, and electric generating facilities accounted for 15 percent. (See Table E–1 and Figure E–1.)

On-site air emissions totaled 2.03 billion pounds, more than one-quarter of the total releases. More than half of all air emissions were reported by the original industries. Electric generating facilities accounted for another 40 percent. The second largest type of release was on-site land releases, primarily from metal mining. Metal mining facilities reported 83 percent of the total 4.75 billion pounds of on-site land releases.

Releases also include transfers of TRI chemicals in waste sent off-site for disposal to such sites as landfills and underground injection wells. The original industries reported more than three-quarters of these off-site releases—374.6 million pounds of the 479.4 million pounds of total off-site releases reported by all TRI industries.

Nevada was the state with the largest total releases reported by new industries. New industry facilities in Nevada reported 1.16 billion pounds of total releases, more than 20 percent of all releases reported by the new industries. (See Table E–2.)

Texas was the state with the largest total releases reported by original industries. The original industry facilities in Texas reported 257.9 million pounds of total releases, more than 10 percent of all releases reported by the original industries.

Overall, total on- and off-site releases increased from 1998 to 1999 by 5 percent. The original industries, coal mining and petroleum terminals and bulk storage facilities reported decreases for that period. The original industries reported a 2.5 percent decrease, coal mining reported a 10 percent decrease and petroleum terminals and bulk storage facilities reported a 5.5 percent decrease. (See Table E–3 and Figure E–2.)

Table E-2. TRI Total Releases by State, Original and New Industries, 1999

State	Total On-site and Off-site Releases					
	Original Industries		New Industries		All TRI Industries	
	Pounds	Rank	Pounds	Rank	Pounds	Rank
Alabama	75,132,585	10	62,995,934	17	138,128,519	16
Alaska	1,671,982	48	431,345,804	4	433,017,786	4
American Samoa	0	—	5,628	54	5,628	55
Arizona	50,782,129	18	912,547,939	3	963,330,068	3
Arkansas	37,592,186	23	3,933,290	43	41,525,476	33
California	42,747,339	21	26,298,645	25	69,045,984	27
Colorado	6,675,202	40	19,409,489	29	26,084,691	39
Connecticut	6,359,752	41	1,475,523	48	7,835,275	47
Delaware	7,708,180	39	3,672,174	44	11,380,354	45
District of Columbia	18,096	53	79,871	52	97,967	54
Florida	76,714,040	9	72,692,580	13	149,406,620	13
Georgia	60,950,277	14	65,974,004	16	126,924,281	19
Guam	0	—	501,108	49	501,108	53
Hawaii	401,133	52	2,173,658	47	2,574,791	49
Idaho	26,517,444	27	59,458,895	19	85,976,339	22
Illinois	95,873,821	6	69,181,076	15	165,054,897	10
Indiana	125,781,848	5	73,088,864	11	198,870,712	9
Iowa	34,665,540	25	14,126,889	32	48,792,429	30
Kansas	33,069,818	26	9,504,240	38	42,574,058	32
Kentucky	45,813,925	20	60,391,397	18	106,205,322	20
Louisiana	134,825,056	4	15,327,549	31	150,152,605	12
Maine	7,728,607	38	120,061	50	7,848,668	46
Maryland	13,626,221	36	30,354,865	24	43,981,086	31
Massachusetts	5,602,815	43	6,273,390	42	11,876,205	44
Michigan	72,468,757	11	69,817,757	14	142,286,514	15
Minnesota	20,080,339	34	11,142,248	36	31,222,587	36
Mississippi	62,452,276	13	13,343,582	34	75,795,858	25
Missouri	56,780,432	17	72,960,345	12	129,740,777	17
Montana	48,659,575	19	78,959,073	9	127,618,648	18
Nebraska	19,012,631	35	8,254,822	41	27,267,453	38
Nevada	4,368,476	44	1,164,039,385	1	1,168,407,861	1
New Hampshire	3,114,421	46	2,757,533	46	5,871,954	48
New Jersey	21,818,000	30	9,465,385	39	31,283,385	35
New Mexico	20,463,178	33	241,812,999	5	262,276,177	7
New York	35,840,928	24	35,973,300	23	71,814,228	26
North Carolina	67,121,835	12	91,228,696	8	158,350,531	11
North Dakota	2,595,162	47	21,060,751	28	23,655,913	40
Northern Marianas	0	—	3,412	55	3,412	56
Ohio	140,208,448	*2	163,019,708	6	303,228,156	6
Oklahoma	22,961,015	29	14,108,242	33	37,069,257	34
Oregon	21,811,249	31	45,884,507	22	67,695,756	28
Pennsylvania	160,461,734	*3	92,314,818	7	252,776,552	8
Puerto Rico	6,324,486	42	11,848,219	35	18,172,705	42
Rhode Island	1,296,069	49	95,029	51	1,391,098	50
South Carolina	59,730,443	15	24,330,454	26	84,060,897	23
South Dakota	3,564,241	45	8,564,736	40	12,128,977	43
Tennessee	88,470,887	7	55,840,140	21	144,311,027	14
Texas	257,858,098	1	56,008,033	20	313,866,131	5
Utah	82,785,620	8	1,079,001,349	2	1,161,786,969	2
Vermont	646,780	51	0	—	646,780	52
Virgin Islands	699,418	50	69,495	53	768,913	51
Virginia	57,411,080	16	23,158,525	27	80,569,605	24
Washington	24,804,178	28	3,670,737	45	28,474,915	37
West Virginia	21,762,246	32	78,729,865	10	100,492,111	21
Wisconsin	40,990,645	22	17,391,132	30	58,381,777	29
Wyoming	9,689,355	37	9,740,423	37	19,429,778	41
Total	**2,326,509,998**		**5,445,527,573**		**7,772,037,571**	

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. **Off-site Releases** do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release.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 Inc. in Claypool, AZ, that reported under SIC code 33 and SIC code 10 in 1999 and previous years has been included in the new industry category SIC code 10 for the purpose of this analysis.

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Table E–3. TRI Total Releases by Industry, Original and New Industries, 1998–1999

SIC Code	Industry	Total On-site and Off-site Releases			
		1998	1999	Change 1998–1999	
		Pounds	Pounds	Pounds	Percent
20–39	Original Industries	2,386,229,289	2,326,509,998	–59,719,291	–2.5
10	Metal Mining	3,560,719,410	3,977,016,866	416,297,456	11.7
12	Coal Mining	13,024,894	11,758,838	–1,266,056	–9.7
491/493	Electric Generating Facilities	1,137,623,361	1,162,509,246	24,885,885	2.2
5169	Chemical Wholesale Distributors	1,537,099	1,971,659	434,560	28.3
5171	Petroleum Terminals and Bulk Storage Facilities	4,514,607	4,268,551	–246,056	–5.5
4953/7389	RCRA Subtitle C TSD and Solvent Recovery Facilities	280,413,169	288,002,413	7,589,244	2.7
	Total	**7,384,061,829**	**7,772,037,571**	**387,975,742**	**5.3**

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. **Off-site Releases** do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release.
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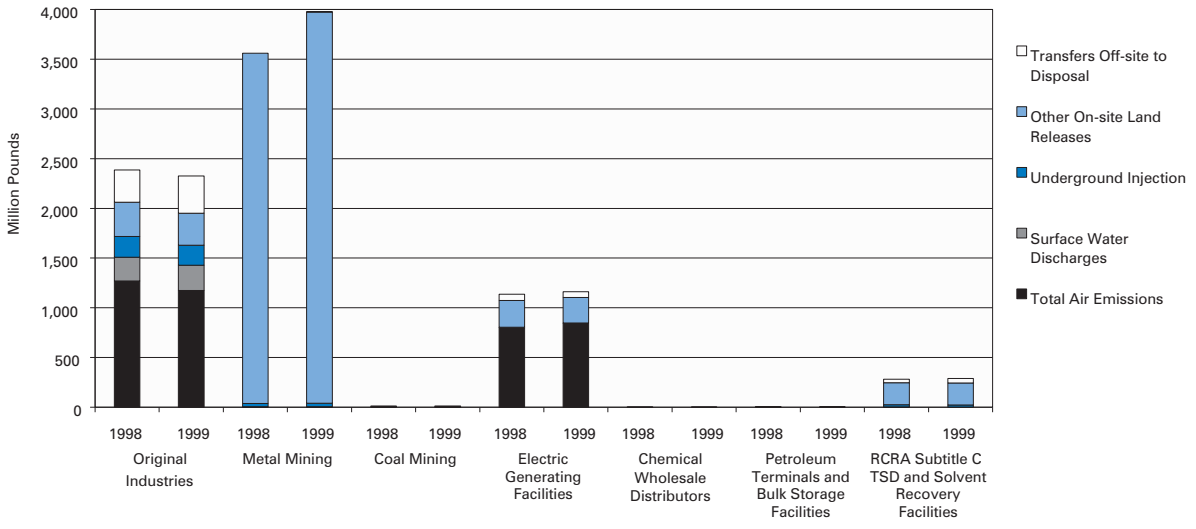
Figure E–2. TRI Total Releases, Original and New Industries, 1998–1999



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The largest increase in total releases from 1998 to 1999 was reported by metal mining—an increase of 416.3 million pounds or 12 percent. This increase was primarily due to one metal mining facility's retiring of a leach pad in 1999. This Utah facility had a large one-year increase of 505 million pounds reported as on-site land releases. Electric generating facilities reported an increase, of 24.9 million pounds or 2 percent. For chemical wholesale distributors, total releases increased by about 400,000 pounds or 28 percent.

Waste Management Data, 1998–1999

During 1999, a total of 29.49 billion pounds of TRI chemicals in production-related waste was reported as managed. More than three-quarters of the production-related waste was managed by original industry facilities. Another 12 percent was reported by metal mining, and electric generating facilities reported managing 6 percent. (See Table E–4 and Figure E–3.)

More than one-quarter of total production-related waste was recycled on-site, mostly by facilities in the original industries. The original industries reported recycling 7.84 billion pounds on-site, more than 97 percent of the total reported by all TRI industries. The second largest type of waste managed was treated on-site—7.60 billion pounds by all TRI industries. Again, the original industries reported the most of this type of waste management, more than 90 percent of the total.

Table E-4. Quantities of TRI Chemicals in Waste by Industry, Original and New Industries, 1999

SIC Code	Industry	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
		On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	Pounds	Pounds	Pounds
20–39	Original Industries	7,839,852,848	2,134,897,467	2,806,098,993	511,631,406	6,850,326,119	571,669,556	2,384,303,476	23,098,779,865	305,727,127
10	Metal Mining	22,184,030	3,305,817	0	840	14,978,477	14,784	3,587,214,014	3,627,697,962	505,192,483
12	Coal Mining	1,137,970	6,753	0	0	376,542	0	10,632,473	12,153,738	34
491/493	Electric Generating Facilities	786,720	7,571,783	5,304,250	42,200	463,594,435	441,961	1,173,660,962	1,651,402,311	318,178
5169	Chemical Wholesale Distributors	19,615,110	206,542	72,746	14,272,788	1,188,795	3,016,945	1,419,993	39,792,919	858,589
5171	PetroleumTerminals and Bulk Storage Facilities	34,171,226	1,649,555	31,599	298,076	7,734,904	681,114	4,149,103	48,715,577	273,565
4953/ 7389	RCRA Subtitle C TSD and Solvent Recovery Facilities	120,601,759	22,417,208	5,354,008	253,050,431	266,454,305	68,475,580	279,212,369	1,015,565,660	15,273
	Total	**8,038,349,663**	**2,170,055,125**	**2,816,861,596**	**779,295,741**	**7,604,653,577**	**644,299,940**	**7,440,592,390**	**29,494,108,032**	**812,385,249**

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.
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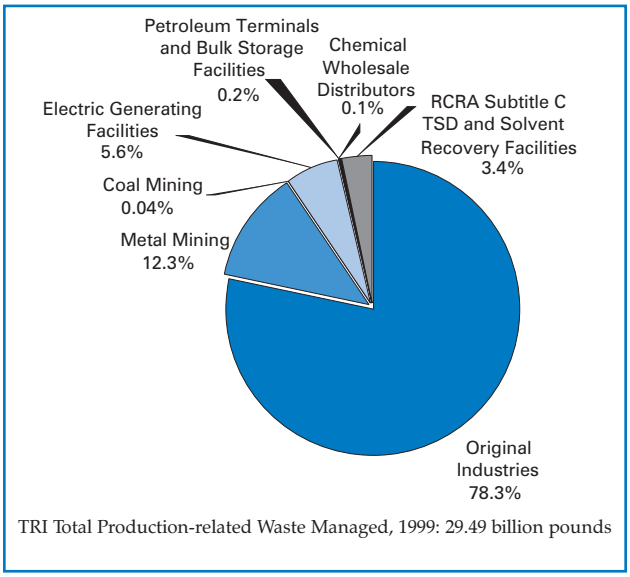
Figure E–3. TRI Total Production-related Waste Managed, Original and New Industries, 1999



Note: Data are from Section 8 of Form R.

The portion of total production-related waste released on- and off-site totaled 7.44 billion pounds, one-quarter of all production-related waste reported for 1999. Metal mining reported almost half of the quantity released on- and off-site and the original industries reported one-third.

Overall, total production-related waste increased by less than 1 percent from 1998 to 1999. The original industries reported an increase of over one percent which was offset by the almost 2 percent decrease reported by the new industries. Both the original and new industries reported decreases in quantities released on- and off-site. The increase came, primarily from amounts treated on-site where the original industries reported an increase of 16 percent and the new industries reported an increase of 20 percent. (See Table E–5 and Figure E–4.) Non-production-related waste is overstated in this report for all years. Those forms indicating NA for non-production-related waste were assigned one pound erroneously. The total amount overstated is about 4,500 pounds for each year.

Total On-site and Off-site Releases 1988–1999

For the core set of chemicals from industries that have reported consistently since 1988, total releases on- and off-site decreased by 45.5 percent between 1988 and 1999, a reduction of 1.46 billion pounds. The number of forms submitted, however, also declined by 5.5 percent. On-site releases decreased by 54 percent (or 1.50 billion pounds); however, off-site releases increased during this period by 8 percent (or 33.0 million pounds). (See Table E–6 and Figure E–5.)

All on-site release categories showed decreases. Air emissions decreased by 61 percent (or 1.32 billion pounds). Surface water discharges decreased by 66 percent (or 27.7 million pounds), underground injection decreased by 32 percent (or 52.6 million pounds) and on-site land releases decreased by 23 percent (or 94.0 million pounds).

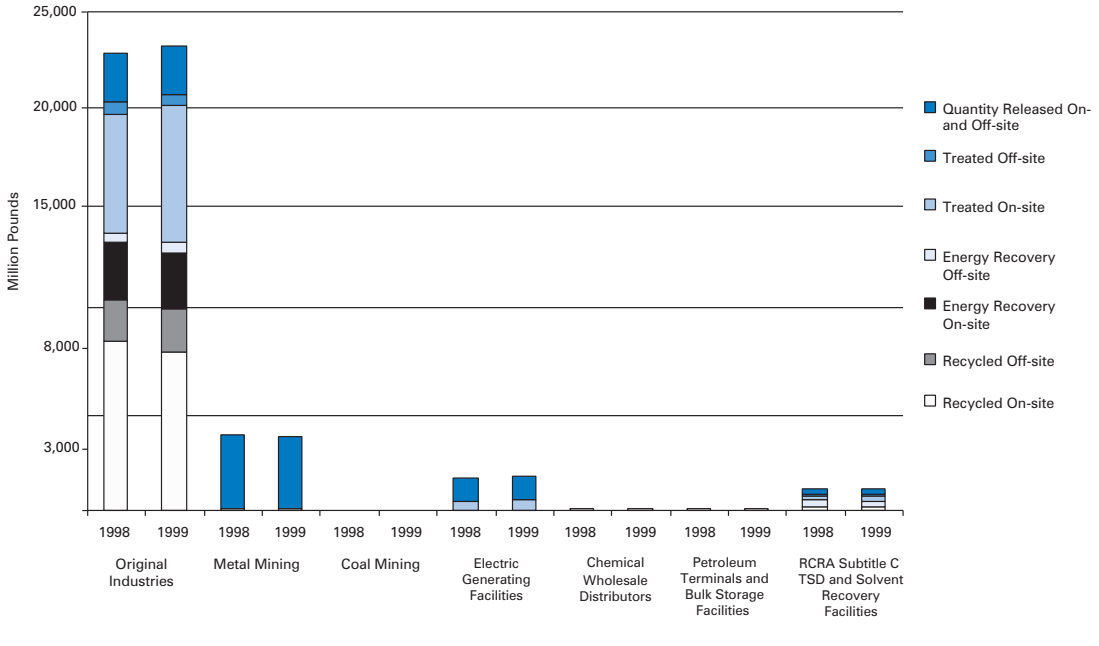
The largest increases in off-site releases occurred in solidification/stabilization of metals, an increase of 110.0 million pounds or (372 percent) and in off-site underground injection, an increase of 11.1 million pounds (or 128 percent). The category of off-site release with the largest decrease, on the other hand, was transfers to landfills and surface impoundments, which decreased by 45.5 million pounds (or 17 percent).

Table E-5. Quantities of TRI Chemicals in Waste by Waste Management Activity, Original and New Industries, 1998–1999

Waste Management Activity	Original Industries			New Industries			All TRI Industries		
	1998	1999	Change 1998–1999	1998	1999	Change 1998–1999	1998	1999	Change 1998–1999
	Pounds	Pounds	Percent	Pounds	Pounds	Percent	Pounds	Pounds	Percent
Recycled On-site	8,407,381,641	7,839,852,848	–6.8	204,380,355	198,496,815	–2.9	8,611,761,996	8,038,349,663	–6.7
Recycled Off-site	2,071,439,013	2,134,897,467	3.1	37,327,609	35,157,658	–5.8	2,108,766,622	2,170,055,125	2.9
Energy Recovery On-site	2,827,695,743	2,806,098,993	–0.8	11,399,201	10,762,603	–5.6	2,839,094,944	2,816,861,596	–0.8
Energy Recovery Off-site	487,588,775	511,631,406	4.9	413,103,773	267,664,335	–35.2	900,692,548	779,295,741	–13.5
Treated On-site	5,913,717,613	6,850,326,119	15.8	629,209,581	754,327,458	19.9	6,542,927,194	7,604,653,577	16.2
Treated Off-site	592,216,295	571,669,556	–3.5	90,988,751	72,630,384	–20.2	683,205,046	644,299,940	–5.7
Quantity Released On- and Off-site	2,475,386,574	2,384,303,476	–3.7	5,118,407,472	5,056,288,914	–1.2	7,593,794,046	7,440,592,390	–2.0
Total Production-related Waste	**22,775,425,654**	**23,098,779,865**	**1.4**	**6,504,816,742**	**6,395,328,167**	**–1.7**	**29,280,242,396**	**29,494,108,032**	**0.7**
Non-production-related Waste	26,308,358	305,723,367	1,062.1	1,611,759	506,658,122	31,335.1	27,924,813	812,385,249	2,809.2

Note: Data are from Section 8 of Form R for 1998 and 1999.
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 Inc. in Claypool, AZ, that reported under SIC code 33 and SIC code 10 in 1999 and previous years has been included in the new industry category SIC code 10 for the purpose of this analysis.
Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change the facility's treated off-site amounts for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising treated off-site for manganese compounds from 5,584,900 pounds to below 500 pounds.

Figure E-4. TRI Production-related Waste Managed, Original and New Industries, 1998–1999



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

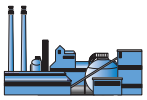


Table E-6. Comparison of TRI On-site and Off-site Releases, Original Industries, 1988, 1995 and 1998–1999

	1988	1995	1998	1999	Change 1988–1999	
	Number	Number	Number	Number	Number	Percent
Total Forms	60,312	60,921	58,521	57,001	–3,311	–5.5
Form Rs	60,312	55,913	50,308	48,913	—	—
Form As	—	5,008	8,213	8,088	—	—
On-site Releases	Pounds	Pounds	Pounds	Pounds	Pounds	Percent
Total Air Emissions	2,180,639,873	1,204,241,021	926,738,884	858,480,472	–1,322,159,401	–60.6
Fugitive Air Emissions	680,462,991	307,062,214	217,594,652	200,342,670	–480,120,321	–70.6
Point Source Air Emissions	1,500,176,882	897,178,807	709,144,232	658,137,802	–842,039,080	–56.1
Surface Water Discharges	41,919,468	16,976,022	17,328,531	14,260,544	–27,658,924	–66.0
Underground Injection	161,915,411	154,739,353	114,704,830	109,315,219	–52,600,192	–32.5
On-site Land Releases	405,909,382	268,346,160	332,307,146	311,947,947	–93,961,435	–23.1
Total On-site Releases	**2,790,384,134**	**1,644,302,556**	**1,391,079,391**	**1,294,004,182**	**–1,496,379,952**	**–53.6**
Off-site Releases						
Storage Only[a]	13,830,674	2,233,190	5,504,460	5,934,163	–7,896,511	–57.1
Solidification/Stabilization[b] Metals and Metal Compounds Only	29,543,178	26,801,593	135,956,958	139,525,845	109,982,667	372.3
Wastewater Treatment (excluding POTWs)[c] Metals and Metal Compounds Only	4,647,706	3,881,107	3,826,735	6,592,982	1,945,276	41.9
Transfers to POTWs[d] Metals and Metal Compounds Only	9,588,447	2,552,146	3,009,214	3,345,324	–6,243,123	–65.1
Underground Injection	8,735,126	12,081,030	9,761,234	19,876,281	11,141,155	127.5
Landfills/Surface Impoundments	265,674,001	215,062,835	225,369,272	220,191,647	–45,482,354	–17.1
Land Treatment	2,704,070	889,966	539,102	2,852,222	148,152	5.5
Other Land Disposal	9,350,408	10,549,826	13,313,524	12,112,847	2,762,439	29.5
Other Off-site Management	37,593,064	13,513,937	9,053,431	31,932,085	–5,660,979	–15.1
Transfers to Waste Broker for Disposal	29,776,880	4,121,369	12,414,747	10,220,169	–19,556,711	–65.7
Unknown[e]	11,270,380	1,646,924	3,370,897	3,143,438	–8,126,942	–72.1
Total Off-site Releases (Transfers Off-site to Disposal)	**422,713,934**	**293,333,923**	**422,119,574**	**455,727,003**	**33,013,069**	**7.8**
Total On-site and Off-site Releases	**3,213,098,068**	**1,937,636,479**	**1,813,198,965**	**1,749,731,185**	**–1,463,366,883**	**–45.5**

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.
Due to an EPA data entry error, three chemical reporting revisions for 1999 by one facility, the US Army Letterkenny Depot in Chambersburg, PA, were not included in tables in this report (except in federal facility tables). The effect of the revisions is to change the facility's off-site transfers to disposal amounts for zinc compounds from 17,147,839 pounds to zero and lead compounds from 60,123 pounds to zero. The facility anticipated revising off-site transfers to disposal for manganese compounds from 5,584,900 pounds to below 500 pounds.

[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.

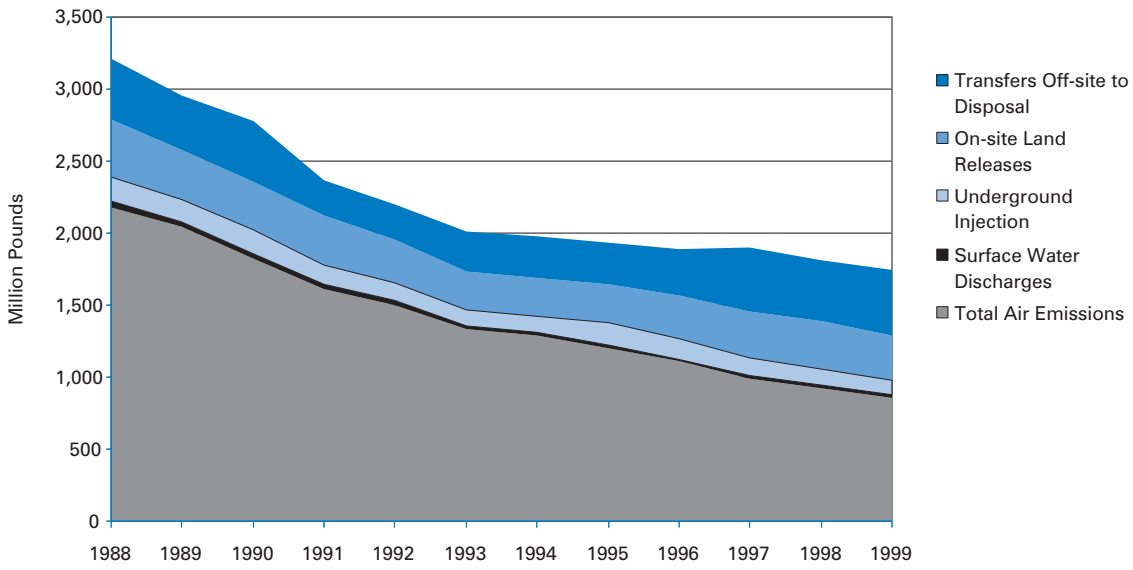
[b] Beginning in reporting year 1997, transfers to solidification/stabilization of metals and metal compounds (waste treatment code M41) are reported separately from transfers to solidification/stabilization of non-metal TRI chemicals (waste treatment code M40). Because this treatment method prepares 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 compounds have been included in solidification/stabilization of metals and metal compounds in this report.

[c] Beginning in reporting year 1997, transfers to wastewater treatment (excluding POTWs) of metals and metal 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 compounds reported under code M60 have been included in transfers of metals and metal compounds to wastewater treatment.

[d] Reported as discharges to POTWs in Section 6.1 of Form R. EPA considers transfers of metals and metal compounds to POTWs 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).

Figure E-5. Distribution of TRI On-site and Off-site Releases, Original Industries, 1988–1999

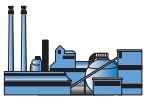


Note: Does not include delisted chemicals, chemicals added in 1990, 1991, 1994 and 1995, aluminum oxide, ammonia, hydrochloric acid and sulfuric acid. **On-site Releases** are from Section 5 of Form R. **Off-site Releases** are from Section 6 (transfers off-site to disposal) of Form R. **Off-site Releases** include metals and metal compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs.

Understanding the Uses, Scope and Limits of TRI Data

While TRI provides the public, industry, and state and local governments an invaluable source of key environmental data, it has some limitations that must be considered when using the data. Although the Agency has expanded the number of industries that must report, the program does not cover all sources of releases and other waste management activities of TRI chemicals. Although TRI is successful in capturing information on a significant portion of toxic chemicals currently being used by covered industry sectors, it does not cover all toxic chemicals or all industry sectors. In addition, facilities that do not meet the TRI threshold levels (those with fewer than 10 full-time employees or those not meeting TRI quantity thresholds) are not required to report. Thus, while the TRI includes 84,068 reports from 22,639 facilities for 1999, the 7.77 billion pounds of on-and off-site releases reported represent only a portion of all toxic chemical releases nationwide.

Furthermore, facilities often report estimated data to TRI, and the program does not mandate that they monitor their releases. Various estimation techniques are used when monitoring data are not available, and EPA has published estimation guidance for the regulated community. Variations between facilities can result from the use of different estimation methodolo-



gies. Patterns of releases and other waste management activities can change dramatically from one year to the next.

These factors should be taken into account when considering data accuracy and comparability.

TRI reports reflect releases and other waste management activities of chemicals, not exposures of the public to those chemicals. Release estimates alone are not sufficient to determine exposure or to calculate potential adverse effects on human health and the environment. Although additional information is necessary to assess exposure and risk, TRI data can be used to identify areas of potential concern.

TRI data, in conjunction with other information, can be used as a starting point in evaluating exposures that may result from releases and other waste management activities of toxic chemicals. The determination of potential risk depends upon many factors, including the toxicity of the chemical, the fate of the chemical after it is released, the locality of the release, and the populations that are exposed to the chemical after its release.

Accessing the TRI Data

The TRI data and data release reports can be accessed through the EPA's TRI home page at <http://www.epa.gov/tri>. The TRI home page also provides other background information on the TRI program and TRI data as well as information on applicable statutes, regulations, and guidance.