2001 Toxics Release Inventory
Executive Summary

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BACKGROUND

The Toxics Release Inventory (TRI) is a publicly available database that contains information on toxic chemical releases and other waste management activities reported annually by certain covered industries as well as by federal facilities. This inventory was established under the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA). In 1990 the information required to be reported to TRI was expanded by the Pollution Prevention Act. There are now nearly 650 toxic chemicals and toxic chemical categories on the list of chemicals that must be reported to EPA and the States under the EPCRA/TRI Program.

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

- Is in the manufacturing sector or, beginning in the 1998 reporting year, is one of the following industry categories: metal mining, coal mining, electrical utilities, chemical wholesale distributors, petroleum terminals and bulk storage facilities, Resource Conservation and Recovery Act (RCRA) subtitle C hazardous waste treatment and disposal facilities, and solvent recovery services. Also, federal facilities must report to TRI regardless of their industrial classification;

- Has 10 or more full-time employee equivalents, and

- For all but certain persistent bioaccumulative toxic (PBT) chemicals, manufactures or processes more than 25,000 pounds or otherwise uses more than 10,000 pounds of any listed chemical during the calendar year.

[1]Two of the chemicals were added to the Polycyclic Aromatic Compounds category.

For the 2000 reporting year, the last criterion was changed for certain PBT chemicals. TRI was expanded to include new PBT chemicals and reporting thresholds were lowered for both the newly-added PBT chemicals and certain PBT chemicals already on the TRI list. In a rule (64 FR 58666) finalized on October 29, 1999, EPA added six PBT chemicals and one PBT chemical category.[1] PBT chemicals persist and bioaccumulate in the environment and they have the potential to pose greater exposure to humans and the environment over a longer period of time, making even small quantities of these chemicals of concern. Therefore, EPA established thresholds lower than the 25,000 pounds and 10,000 pounds. For those chemicals that are persistent and bioaccumulate, a threshold of 100 pounds manufactured, processed or otherwise used was established. For the subset of PBT chemicals that are highly persistent and highly bioaccumulative, a threshold of 10 pounds was established. In addition, because dioxins are highly persistent and highly bioaccumulative, but are generally produced in extremely small amounts, the threshold for dioxin and dioxin-like compounds was set at 0.1 gram.

Reporting thresholds for lead and lead compounds were lowered in a separate PBT chemical rule (66 FR 4500) finalized on January 17, 2001. The lower reporting threshold and requirements for lead and lead compounds became effective for the 2001 reporting year and apply to all lead and lead compounds except for lead when it is contained in stainless steel, brass, or bronze alloys.

2001 DATA RELEASE

The time period covered for the 2001 data release is the reporting year 2001. A reporting year is the

same as a calendar year. The 2001 data were submitted to EPA by July 1, 2002 and are the focus of this report. The Public Data Release report is an analysis of the 2001 TRI data and trends in the data from 1988 to 2001.

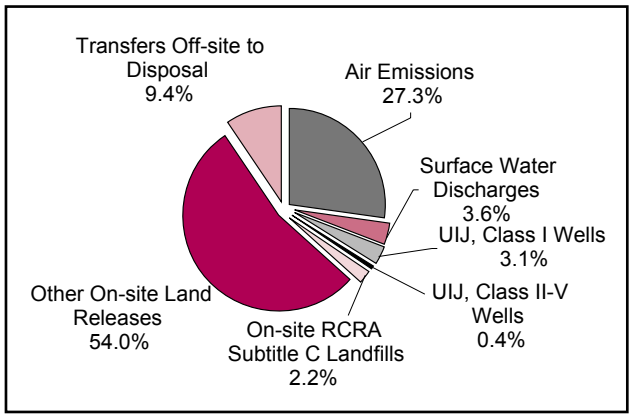
For the 2000 reporting year, certain PBT chemicals (see above) were added to the list of TRI chemicals. Also, in October 1999, EPA added vanadium compounds to the TRI list and changed the reporting qualifier for vanadium (already on the list of TRI chemicals) from "fume or dust" to "except when contained in an alloy." Vanadium and vanadium compounds have not been classified as PBT chemicals. For the 2001 reporting year, the thresholds for lead and lead compounds (except for lead when it is contained in stainless steel, brass, or bronze alloys) were lowered to 100 pounds.

The 1998-2001 data include reporting by the manufacturing industries, metal mining, coal mining, electrical utilities, hazardous waste treatment and disposal facilities, solvent recovery facilities, chemical wholesale distributors, and petroleum bulk stations and terminals. The manufacturing sector has been reporting since 1987, federal facilities have been reporting since 1994, and the other industry sectors have been reporting since 1998. Analyses for this period also include only those chemicals reportable since 1998 with the same reporting threshold and same definition.

The analysis of trends in the TRI data from 1988 to 2001 includes only the manufacturing industries and those listed chemicals that have been reportable since 1988 with the same reporting threshold and same definition.

Year-to-year comparisons are based on a consistent set of chemicals and reporting industries to assure that any changes in releases or other waste management data do not simply reflect changes in reporting requirements from year to year. Thus, comparisons of 2001 data with prior years do not include persistent bioaccumulative toxic chemicals subject to the October 1999 PBT chemical rule and the January 2001 lead rule, or vanadium and vanadium compounds since reporting thresholds or reporting definitions for these chemicals have changed.

Figure ES-1: Distribution of TRI On-site and Off-site Releases, 2001



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

UIJ = Underground injection

On-site and Off-site Releases, 2001

In 2001, 24,896 facilities submitted 95,513 forms. On- and off-site releases for all TRI facilities totaled 6.16 billion pounds for 2001. (See Table ES-1 and Figure ES-1.)

On-site releases totaled 5.58 billion pounds or 91 percent of total releases on- and off-site in 2001. The largest type of on-site releases was on-site land releases, totaling 3.46 billion pounds or 56 percent of total releases on- and off-site. As shown in Table ES-1, the largest type of on-site land releases was other disposal (that is, on-site land releases other than to landfills, land treatment, and surface impoundments, and may include releases to waste piles or from spills or leaks). Other disposal totaled 2.04 billion pounds or 33 percent of total releases in 2001.

On-site air emissions, the second largest type of release, were 1.68 billion pounds or 27 percent of total releases. On-site surface water discharges were 220.8 million pounds and accounted for almost 4 percent of total releases. On-site releases to

Table ES-1: TRI On-site and Off-site Releases, 2001

	Number	Percent of Total
Total Facilities	24,896	--
Total Forms	95,513	100.0
Form Rs	83,218	87.1
Form As	12,295	12.9
On-site Releases	**Pounds**	**Percent of Total**
Total Air Emissions	1,679,373,058	27.3
Fugitive Air Emissions	240,558,980	3.9
Point Source Air Emissions	1,438,814,078	23.4
Surface Water Discharges	220,796,115	3.6
Underground Injection	215,424,286	3.5
Class I Wells	193,436,563	3.1
Class II-V Wells	21,987,723	0.4
On-site Land Releases	3,464,680,533	56.3
RCRA Subtitle C Landfills	138,220,131	2.2
Other On-site Landfills	308,599,626	5.0
Land Treatment	14,122,290	0.2
Surface Impoundments	965,279,810	15.7
Other Disposal	2,038,458,676	33.1
Total On-site Releases	**5,580,273,993**	**90.6**
Off-site Releases		
Storage Only*	6,121,927	0.1
Solidification/Stabilization**	123,464,082	2.0
Metals and Metal Category Compounds Only		
Wastewater Treatment (Excluding POTWs)***	3,768,614	0.1
Metals and Metal Category Compounds Only		
Transfers to POTWs****	2,211,172	0.04
Metals and Metal Category Compounds Only		
Underground Injection	16,137,684	0.3
Landfills/Surface Impoundments	364,712,642	5.9
Land Treatment	7,263,730	0.1
Other Land Disposal	22,291,065	0.4
Other Off-site Management	15,606,659	0.3
Transfers to Waste Broker for Disposal	12,016,593	0.2
Unknown*****	4,128,918	0.1
Total Off-site Releases	**577,723,085**	**9.4**
(Transfers Off-site to Disposal)		
Total On- and Off-site Releases	**6,157,997,078**	**100.0**

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

* 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.

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

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

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

***** 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).

Table ES-2: TRI On-site and Off-site Releases by State, 2001

State	Total Facilities	On-site Releases							Off-site Releases		
				Underground Injection		On-site Land Releases					
		Total Air Emissions	Surface Water Discharges	Class I Wells	Class II-V Wells	RCRA Subtitle C Landfills	Other On-site Land Releases	Total On-site Releases	Transfers Off-site to Disposal	Total On- and Off-site Releases	
	Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Rank
Alabama	566	75,567,809	4,713,394	0	92,912	7,161,905	34,615,126	122,151,146	12,294,431	134,445,577	13
Alaska	32	3,201,013	76,438	0	20,554,878	0	498,234,331	522,066,660	6,071	522,072,731	4
American Samoa	2	6,920	0	0	0	0	0	6,920	0	6,920	56
Arizona	275	4,600,105	6,376	0	0	4,886	601,481,177	606,092,545	721,776	606,814,321	3
Arkansas	385	20,036,562	3,190,528	1,492,971	93,263	227,275	6,416,583	31,457,181	12,585,384	44,042,566	31
California	1,612	20,020,008	4,924,819	0	55,902	23,436,456	4,644,856	53,082,041	5,467,403	58,549,443	27
Colorado	231	3,629,554	3,752,564	0	0	41,889	24,026,000	31,450,008	5,596,405	37,046,413	34
Connecticut	385	4,821,957	785,064	0	0	0	2,462	5,609,483	4,145,809	9,755,293	47
Delaware	79	6,651,525	573,937	0	0	0	965,666	8,191,129	3,883,235	12,074,363	44
District of Columbia	8	40,733	13,943	0	0	0	4,927	59,603	970	60,573	54
Florida	702	83,429,911	1,590,342	23,796,396	709	1,236,511	8,368,063	118,421,931	4,780,008	123,201,939	15
Georgia	795	91,834,154	8,391,937	0	0	17,986	13,615,623	113,859,700	2,659,943	116,519,643	17
Guam	8	192,898	17	0	0	26	5,519	198,460	23	198,483	53
Hawaii	38	2,379,957	29,770	5	2,066	0	224,400	2,636,198	430,339	3,066,537	49
Idaho	92	5,000,464	5,821,110	0	0	33,341,745	29,655,656	73,818,976	1,362,893	75,181,868	23
Illinois	1,376	59,411,352	8,087,041	327	2,172	24,623,694	20,127,859	112,252,445	25,496,565	137,749,010	12
Indiana	1,101	77,828,675	20,104,003	1,074,584	140	163,777	29,918,043	129,089,222	76,468,560	205,557,782	8
Iowa	433	24,332,303	3,145,360	0	0	17,600	5,504,922	33,000,185	4,873,295	37,873,480	32
Kansas	302	14,768,804	1,149,296	558,721	500	0	8,381,934	24,859,255	6,807,335	31,666,590	36
Kentucky	494	58,703,794	2,118,567	0	54,425	1,609	21,102,560	81,980,954	11,714,700	93,695,654	19
Louisiana	382	75,960,815	11,908,380	37,112,860	0	3,737,937	11,909,258	140,629,250	5,191,651	145,820,901	11
Maine	118	4,657,404	3,975,970	0	0	0	725,873	9,359,246	1,353,438	10,712,685	46
Maryland	211	36,076,213	3,839,690	0	56,057	0	2,806,914	42,778,874	2,645,338	45,424,212	29
Massachusetts	654	7,447,906	73,437	0	0	935	825,302	8,347,581	2,738,148	11,085,729	45
Michigan	939	56,656,492	1,043,401	2,509,470	100	12,843,205	9,419,827	82,472,496	49,444,297	131,916,793	14
Minnesota	505	14,252,131	1,571,683	0	0	250	9,696,375	25,520,439	7,874,871	33,395,310	35
Mississippi	356	37,063,726	12,964,677	11,046,901	0	176,756	7,943,087	69,195,147	1,891,154	71,086,301	24
Missouri	619	34,177,643	1,660,217	0	0	67,560	76,783,159	112,688,579	7,201,119	119,889,698	16
Montana	49	4,292,997	48,785	0	369,092	2,395	58,030,810	62,744,079	2,644,099	65,388,178	25
Nebraska	185	7,875,435	9,601,101	0	0	0	6,383,985	23,860,521	2,808,896	26,669,417	38
Nevada	103	2,728,933	82,849	0	785	3,988,273	774,255,862	781,056,702	2,437,928	783,494,630	1
New Hampshire	156	4,496,284	10,675	0	0	0	10,088	4,517,047	241,606	4,758,653	48
New Jersey	604	13,809,784	3,729,623	0	6	159,935	154,682	17,854,029	40,987,748	58,841,777	26
New Mexico	80	1,072,357	40,023	37,389	0	0	102,121,661	103,271,430	2,561,720	105,833,149	18
New York	775	29,629,649	6,733,053	1	0	7,677	3,398,501	39,768,882	5,062,168	44,831,050	30
North Carolina	914	115,130,332	9,887,436	0	0	765	12,415,324	137,433,858	10,234,240	147,668,098	10
North Dakota	47	4,328,230	110,470	0	0	0	12,303,643	16,742,343	8,534,710	25,277,053	39
Northern Marianas	3	7,953	0	0	0	0	2	7,955	0	7,955	55
Ohio	1,725	121,295,468	8,339,219	31,993,954	0	12,953,608	22,897,310	197,479,559	57,084,073	254,563,632	6
Oklahoma	343	17,377,943	2,391,127	4,828	0	2,518,028	2,976,818	25,268,743	3,618,278	28,887,021	37
Oregon	307	12,914,088	2,912,278	0	0	3,999,477	16,602,446	36,428,289	1,148,229	37,576,517	33
Pennsylvania	1,436	89,034,059	18,741,435	0	0	339,536	11,188,248	119,303,278	88,180,766	207,484,044	7
Puerto Rico	161	14,556,276	35,624	0	0	250	13,664	14,605,814	1,000,785	15,606,599	42
Rhode Island	160	824,582	10,171	0	0	250	108	835,111	262,989	1,098,100	50
South Carolina	561	54,977,393	2,778,925	0	0	16,281	5,300,147	63,072,746	18,188,165	81,260,912	20
South Dakota	91	1,799,135	2,413,621	0	704,700	12,380	8,520,378	13,450,214	77,038	13,527,252	43
Tennessee	692	79,573,558	3,067,358	0	5	341,993	58,960,603	141,943,517	7,017,705	148,961,221	9
Texas	1,556	102,748,862	26,007,896	77,648,758	0	1,454,403	28,396,993	236,256,913	34,278,163	270,535,075	5
Utah	179	19,220,667	1,215,070	0	0	5,266,999	740,512,297	766,215,034	982,691	767,197,725	2
Vermont	47	136,536	75,573	0	0	178	255	212,542	150,460	363,002	52
Virgin Islands	5	892,660	132,256	0	0	0	7,283	1,032,199	6,419	1,038,618	51
Virginia	507	57,216,768	6,963,083	0	5	1,076	6,434,629	70,615,561	9,168,292	79,783,853	22
Washington	347	14,295,076	2,123,223	0	6	6,109	5,096,793	21,521,207	2,371,067	23,892,274	40
West Virginia	188	59,430,131	3,788,537	14,397	0	5,484	11,485,102	74,723,651	5,416,357	80,140,007	21
Wisconsin	931	25,139,472	4,033,349	0	0	43,034	2,871,611	32,087,466	14,721,061	46,808,527	28
Wyoming	44	1,817,602	11,395	6,145,000	0	0	8,715,656	16,689,653	902,273	17,591,926	41
Total	**24,896**	**1,679,373,058**	**220,796,115**	**193,436,563**	**21,987,723**	**138,220,131**	**3,326,460,403**	**5,580,273,993**	**577,723,085**	**6,157,997,078**	

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

underground injection wells totaled 215.4 million pounds or 3.5 percent of total releases in 2001.

Releases also include transfers of TRI chemicals in waste sent off-site for disposal to such sites as landfills and underground injection wells. Off-site releases (transfers off-site to disposal) were 577.7 million pounds or 9 percent of all releases in 2001. Of these off-site releases 364.7 million pounds of chemicals were sent off-site to landfills/surface impoundments and 123.5 million pounds of metals and metal category compounds were sent for solidification/stabilization.

On- and Off-site Releases by State

Nevada, followed by Utah, Arizona, and Alaska, were the four states with the largest total on- and off-site releases. They each reported more than 500 million pounds in total releases for 2001. (See Table ES-2.)

Facilities in Nevada reported total releases of 783.5 million pounds and those in Utah reported 767.2 million pounds. Nevada and Utah each accounted for about 13 percent of all releases on- and off-site in 2001. Arizona had 606.8 million pounds of releases on- and off-site or 10 percent of the total and Alaska had 522.1 million pounds, or 8.5 percent of the total for 2001. These four states each had more than 95 percent of their total releases as other on-site releases (that is, on-site land releases to other than RCRA subtitle C landfills).

Texas had the fifth largest total releases on- and off-site in 2001, with 270.5 million pounds or 4 percent of total releases. Facilities in Texas reported the largest on-site underground injection, with 77.6 million pounds or 40 percent of total on-site underground injection in 2001, all of which went to Class I wells. Texas also reported the largest surface water discharges, with 26.0 million pounds or 12 percent of all such releases in 2001.

Ohio had the sixth largest total releases on- and off-site, with 254.6 million pounds or 4 percent of the total. Facilities in Ohio reported the largest air emissions, with 121.3 million pounds or 7 percent of all on-site air emissions in 2001. North Carolina facilities reported the second largest air emissions, with 115.1 million pounds or about 7 percent of total air emissions.

After Ohio, Pennsylvania had the next largest total releases on- and off-site (207.5 million pounds or 3 percent of the total). Facilities in Pennsylvania reported the largest off-site releases (transfers off-site to disposal) in 2001, with 88.2 million pounds or 15 percent of total off-site releases in 2001.

On- and Off-site Releases by Industry

The metal mining industry reported the largest total releases on- and off-site in 2001. The 2.78 billion pounds of total releases in 2001 reported by metal mining facilities accounted for 45 percent of all releases on- and off-site in 2001. Most (over 99 percent) releases by the metal mining industry were as other on-site land releases (that is, on-site land releases to other than RCRA subtitle C landfills). The 2.76 billion pounds of other on-site land releases reported by the metal mining industry in 2001 represented 83 percent of all such releases. (See Table ES-3.)

Electric utilities reported the second largest releases on- and off-site in 2001, with 1.06 billion pounds or 17 percent of total releases. Over two-thirds of releases by electric utilities were air emissions. The 717.6 million pounds of air releases from electric utilities accounted for 43 percent of all air emissions reported in 2001. Electric utilities reported 266.7 million pounds of other on-site land releases (other than to RCRA subtitle C landfills), which made it the industry sector with the second largest amount of such releases.

The chemical manufacturing industry reported 582.6 million pounds of releases on- and off-site in 2001, making it the industry sector with the third largest releases. Total releases by the chemicals industry accounted for 9.5 percent of total releases from all sectors in 2001. Chemical manufacturers reported the largest amount of on-site underground injection, with 168.0 million pounds or 78 percent of all such releases.

Table ES-3: TRI On-site and Off-site Releases by Industry, 2001

SIC Code	Industry	Total Facilities	Total Forms	On-site Releases						Total On-site Releases	Off-site Releases	Total On- and Off-site Releases
				Total Air Emissions	Surface Water Discharges	Underground Injection		On-site Land Releases			Transfers Off-site to Disposal	
						Class I Wells	Class II-V Wells	RCRA Subtitle C Landfills	Other On-site Land Releases			
		Number	Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
10	Metal Mining	89	658	2,854,512	427,312	0	21,629,444	0	2,757,118,053	2,782,029,322	524,935	2,782,554,257
12	Coal Mining	88	348	768,762	760,047	14,387	149,109	0	14,414,576	16,106,880	10,830	16,117,710
20	Food	1,688	3,611	56,136,054	55,154,841	56,231	677	254	7,553,308	118,901,365	6,161,820	125,063,185
21	Tobacco	31	67	2,491,746	532,888	0	0	0	215,914	3,240,548	322,970	3,563,517
22	Textiles	289	671	5,740,423	175,447	0	0	0	295,953	6,211,823	749,261	6,961,084
23	Apparel	16	41	343,274	5	0	0	0	85	343,364	57,862	401,226
24	Lumber	1,006	2,499	30,478,706	19,931	0	0	4,092	394,721	30,897,450	518,539	31,415,989
25	Furniture	282	632	7,823,922	557	0	0	0	32	7,824,511	184,300	8,008,810
26	Paper	507	3,128	157,150,488	16,536,395	0	0	31,330	16,168,805	189,887,018	5,767,146	195,654,165
27	Printing	231	478	19,290,560	305	0	0	0	4,531	19,295,396	424,007	19,719,402
28	Chemicals	3,618	20,355	227,840,792	57,577,475	167,868,820	95,407	1,174,731	46,748,593	501,305,818	81,278,999	582,584,818
29	Petroleum	542	4,299	48,169,295	17,091,882	1,973,515	56,363	41	780,800	68,071,896	3,312,421	71,384,317
30	Plastics	1,822	3,909	77,101,109	71,092	0	0	72,149	841,059	78,085,410	10,450,023	88,535,433
31	Leather	60	149	1,207,544	124,727	0	0	0	8,596	1,340,867	1,273,813	2,614,681
32	Stone/Clay/Glass	1,027	2,800	31,265,083	162,077	0	54,431	37,180	3,863,435	35,382,207	5,078,467	40,460,674
33	Primary Metals	1,941	7,445	57,612,307	44,670,397	842,853	5	5,736,662	177,961,804	286,824,028	271,764,651	558,588,679
34	Fabricated Metals	2,959	8,089	40,447,264	1,743,317	1	2,172	110,340	511,183	42,814,277	21,204,117	64,018,394
35	Machinery	1,143	2,881	8,279,835	18,063	0	0	56,873	2,394,310	10,749,081	4,610,570	15,359,651
36	Electrical Equip.	1,831	3,883	12,721,139	2,936,994	0	0	19,017	681,803	16,358,954	7,575,105	23,934,059
37	Transportation Equip.	1,348	4,872	66,691,884	198,256	750	0	45,805	727,692	67,664,387	12,965,556	80,629,943
38	Measure./Photo.	375	749	7,166,923	1,424,454	0	0	301	13,009	8,604,688	770,558	9,375,245
39	Miscellaneous	312	683	6,764,766	36,566	0	0	14,102	1,865	6,817,299	1,616,458	8,433,757
--	Multiple codes 20-39	1,317	4,869	66,687,839	16,511,697	1,723	10	263,125	5,360,924	88,825,318	15,100,990	103,926,308
--	No codes 20-39	348	887	3,369,277	1,065,165	0	0	3,884	8,204,785	12,643,111	1,120,451	13,763,561
491/493	Electric Utilities	732	6,634	717,575,860	3,519,693	0	4	1,383,707	266,699,366	989,178,631	73,068,649	1,062,247,281
5169	Chemical Wholesale Distributors	475	3,335	1,254,310	1,856	5	0	5	1,074	1,257,250	211,020	1,468,270
5171	Petroleum Bulk Terminals/Bulk Storage	596	4,779	21,164,969	11,177	0	100	26	11,215	21,187,488	153,163	21,340,651
7389/4953	Hazardous Waste/Solvent Recovery	223	2,762	974,414	23,498	22,678,278	0	129,266,508	15,482,910	168,425,606	51,446,405	219,872,011
	Total	**24,896**	**95,513**	**1,679,373,058**	**220,796,115**	**193,436,563**	**21,987,723**	**138,220,131**	**3,326,460,403**	**5,580,273,993**	**577,723,085**	**6,157,997,078**

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

Facilities/forms are included in the manufacturing industry categories (SIC Codes 20-39) if they did not report a SIC code in the other industries. Forms that reported more than one 2-digit SIC code within the range 20 to 39 are assigned to the "multiple codes" category. Facilities/forms are included in the other industry categories if the facility/form has a SIC code in the other industries 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 manufacturing and other industry SIC codes, then the facility/form is included in the manufacturing industry category. If the facility reported for the first time in 1998 or later and the facility/form has a combination of manufacturing and other industry SIC codes, then the facility/form is included in the other industry category. Forms with no 2-digit SIC code are included in the “no codes 20-39” category. One facility, Phelps Dodge Miami of Claypool, AZ, that reported under SIC code 33 and SIC code 10 in 2001 and previous years has been included in SIC code 10 for the purpose of this analysis.

Table ES-4: Top 20 Chemicals with the Largest Total Releases, 2001

CAS Number	Chemical	On-site Releases: Total Air Emissions (Pounds)	Surface Water Discharges (Pounds)	Underground Injection: Class I Wells (Pounds)	Underground Injection: Class II-V Wells (Pounds)	On-site Land Releases: RCRA Subtitle C Landfills (Pounds)	On-site Land Releases: Other On-site Land Releases (Pounds)	Total On-site Releases (Pounds)	Off-site Releases: Transfers Off-site to Disposal (Pounds)	Total On- and Off-site Releases (Pounds)
--	Copper compounds	1,416,114	418,663	176,425	717,758	4,123,867	994,136,994	1,000,989,821	17,096,211	1,018,086,032
--	Zinc compounds	6,159,692	2,172,966	537,865	9,119,066	19,080,399	719,530,209	756,600,197	205,468,291	962,068,488
7647-01-0	Hydrochloric acid	587,134,079	2,445	46,398	2,172	0	188,608	587,373,702	746,442	588,120,144
--	Lead compounds	1,254,381	362,122	206,138	6,026,677	5,986,663	358,128,545	371,964,527	50,213,158	422,177,685
--	Manganese compounds	1,877,226	6,236,782	11,316,486	1,165,027	3,562,861	328,138,941	352,297,323	47,995,623	400,292,945
--	Arsenic compounds	177,832	141,172	65,713	1,466,028	3,130,653	373,104,273	378,085,671	3,000,912	381,086,583
--	Nitrate compounds	515,899	192,795,905	36,865,869	1,643	87,500	13,419,054	243,685,870	14,174,527	257,860,397
--	Barium compounds	2,163,853	1,475,918	15,514	1,965,433	2,351,397	198,668,435	206,640,550	45,504,419	252,144,968
67-56-1	Methanol	175,844,606	3,380,299	13,377,821	80,001	97,719	1,354,297	194,134,743	2,829,290	196,964,033
7664-41-7	Ammonia	122,057,546	6,621,166	22,930,936	43,301	15,065	3,605,984	155,273,998	3,247,048	158,521,046
7664-93-9	Sulfuric acid	146,397,844	694	679,045	0	66,810	481,965	147,626,358	129,606	147,755,964
--	Chromium compounds	671,106	178,352	2,188,916	51,250	2,676,859	94,041,777	99,808,260	16,725,832	116,534,092
--	Vanadium compounds	1,399,953	639,856	882,575	0	51,005	78,884,807	81,858,196	6,641,947	88,500,143
108-88-3	Toluene	71,539,704	75,909	264,765	365	82,903	44,754	72,008,400	1,780,473	73,788,873
7664-39-3	Hydrogen fluoride	67,248,474	21,549	4,400,000	0	30,407	249,168	71,949,598	136,470	72,086,068
--	Nickel compounds	1,004,693	244,846	710,080	270,609	5,600,859	45,383,246	53,214,334	13,753,100	66,967,433
7439-96-5	Manganese	904,434	165,392	0	0	3,796,840	12,535,661	17,402,327	31,582,035	48,984,362
100-42-5	Styrene	46,466,141	2,993	394,001	0	106,595	58,625	47,028,355	1,953,117	48,981,473
1330-20-7	Xylene (mixed isomers)	47,081,406	21,972	80,521	550	133,072	44,222	47,361,743	1,158,921	48,520,664
110-54-3	n-Hexane	47,644,345	10,531	69,663	0	343	9,600	47,734,482	427,958	48,162,440
	Subtotal (top 20 chemicals)	**1,328,959,329**	**214,969,533**	**95,208,731**	**20,909,880**	**50,981,817**	**3,222,009,165**	**4,933,038,455**	**464,565,380**	**5,397,603,835**
	Total (all chemicals)	**1,679,373,058**	**220,796,115**	**193,436,563**	**21,987,723**	**138,220,131**	**3,326,460,403**	**5,580,273,993**	**577,723,085**	**6,157,997,078**

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

The primary metals industry reported the fourth largest releases on- and off-site, with 558.6 million pounds or 9 percent of total releases in 2001. The primary metals industry had the largest off-site releases (transfers off-site to disposal) of any industry, with 271.8 million pounds accounting for 47 percent of all off-site releases in 2001.

On- and Off-site Releases by Chemical

Table ES-4 lists the 20 TRI chemicals with the largest total releases in 2001. On- and off-site releases of the top 20 TRI chemicals totaled 5.40 billion pounds, 88 percent of the total 6.16 billion pounds of all TRI chemicals released on- and off-site. Total on-site releases for these 20 TRI chemicals totaled 4.93 billion pounds, representing 88 percent of all on-site releases. Off-site releases (transfers off-site to disposal) constituted 464.6 million pounds or 80 percent of all off-site releases in 2001.

Of the 5.40 billion pounds of total releases of the top 20 TRI chemicals, 3.22 billion pounds or 60 percent were as other on-site land releases (that is, on-site land releases to other than RCRA subtitle C landfills). Another 25 percent (1.33 billion pounds) were on-site air emissions. The distribution of releases for the top 20 TRI chemicals differed somewhat from that for all TRI chemicals, where 54 percent of total releases were other on-site land releases and 27 percent were on-site air emissions.

Copper compounds constituted 17 percent (1.02 billion pounds) of the 6.16 billion pounds of total on- and off-site releases for all TRI chemicals in 2001. Zinc compounds accounted for the second largest releases, with 962.1 million pounds or 16 percent. Hydrochloric acid was the third-most common chemical, constituting 10 percent (588.1 million pounds). Most of the releases of copper and zinc compounds were as other on-site land releases (that is, other than RCRA subtitle C landfills) while most releases of hydrochloric acid were on-site air emissions.

Table ES-5: TRI On-site and Off-site Releases, PBT Chemicals, 2001

CAS Number	Chemical	Total Forms	On-site Releases							Off-site Releases	Total On- and Off-site Releases
					Underground Injection		On-site Land Releases				
			Total Air Emissions	Surface Water Discharges	Class I Wells	Class II-V Wells	RCRA Subtitle C Landfills	Other On-site Land Releases	Total On-site Releases	Transfers Off-site to Disposal	
		Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds--
	Dioxin and dioxin-like compounds*	**1,320**	**6.37**	**4.08**	**0.14**	**0.19**	**21.97**	**94.39**	**127.14**	**200.88**	**328.01**
--	*Dioxin and dioxin-like compounds (in grams)**	*1,320*	*2,887.566*	*1,850.869*	*63.881*	*84.270*	*9,963.843*	*42,807.558*	*57,657.988*	*91,100.805*	*148,758.793*
	Lead and Lead Compounds	**8,561**	**1,633,121.66**	**413,419.80**	**206,138.00**	**6,026,683.34**	**18,610,199.14**	**360,809,675.39**	**387,699,237.33**	**55,292,470.94**	**442,991,708.27**
7439-92-1	Lead	4,201	378,740.71	51,297.37	0.00	6.65	12,623,535.98	2,681,130.01	15,734,710.71	5,079,312.56	20,814,023.27
--	Lead compounds	4,360	1,254,380.94	362,122.44	206,138.00	6,026,676.69	5,986,663.17	358,128,545.38	371,964,526.62	50,213,158.38	422,177,685.00
	Mercury and Mercury Compounds	**1,665**	**150,462.84**	**1,805.15**	**1,741.11**	**8,035.04**	**60,008.84**	**4,455,980.78**	**4,678,033.75**	**228,282.95**	**4,906,316.70**
7439-97-6	Mercury	537	24,698.08	341.73	460.40	0.00	19,861.63	11,899.27	57,261.10	76,715.67	133,976.77
--	Mercury compounds	1,128	125,764.77	1,463.42	1,280.71	8,035.04	40,147.21	4,444,081.51	4,620,772.66	151,567.27	4,772,339.93
	Polycyclic Aromatic Compounds	**3,813**	**1,177,581.28**	**17,069.76**	**2.10**	**332.95**	**97,094.05**	**71,292.51**	**1,363,372.65**	**1,622,784.90**	**2,986,157.55**
191-24-2	Benzo(g,h,i)perylene	1,509	31,455.26	685.17	1.00	1.65	3,716.71	4,852.90	40,712.69	86,240.63	126,953.32
--	Polycyclic aromatic compounds	2,304	1,146,126.02	16,384.58	1.10	331.30	93,377.34	66,439.62	1,322,659.96	1,536,544.27	2,859,204.23
1336-36-3	**Polychlorinated biphenyls (PCBs)**	**137**	**1,359.90**	**2.80**	**0.00**	**0.00**	**2,265,476.30**	**225,685.85**	**2,492,524.85**	**12,251.02**	**2,504,775.86**
	Pesticides	**130**	**6,559.55**	**282.29**	**115.14**	**0.00**	**15,182.57**	**38,277.70**	**60,417.25**	**50,845.10**	**111,262.34**
309-00-2	Aldrin	8	0.31	0.00	0.00	0.00	0.00	0.00	0.31	1.07	1.38
57-74-9	Chlordane	20	15.49	80.00	0.00	0.00	3,630.30	0.00	3,725.79	331.61	4,057.40
76-44-8	Heptachlor	15	6.04	0.00	0.00	0.00	271.69	0.00	277.73	28.24	305.97
465-73-6	Isodrin	5	0.35	0.00	0.00	0.00	19.00	0.00	19.35	441.40	460.75
72-43-5	Methoxychlor	15	25.19	0.00	0.00	0.00	334.69	0.00	359.88	95.93	455.81
40487-42-1	Pendimethalin	18	3,573.66	195.00	0.00	0.00	185.00	28,832.00	32,785.66	46,702.21	79,487.87
8001-35-2	Toxaphene	18	42.34	6.29	0.14	0.00	3,073.89	0.00	3,122.66	854.53	3,977.18
1582-09-8	Trifluralin	31	2,896.17	1.00	115.00	0.00	7,668.00	9,445.70	20,125.87	2,390.11	22,515.98
	Other PBTs	**168**	**55,273.40**	**463.43**	**23.48**	**0.02**	**19,006.97**	**203,735.50**	**278,502.80**	**637,304.07**	**915,806.87**
118-74-1	Hexachlorobenzene	99	1,199.39	321.61	22.00	0.02	18,586.97	4,937.60	25,067.59	11,107.40	36,174.98
29082-74-4	Octachlorostyrene	4	0.00	0.12	0.00	0.00	0.00	193.00	193.12	508.60	701.72
608-93-5	Pentachlorobenzene	17	69.10	132.70	1.48	0.00	420.00	1,929.90	2,553.18	206.32	2,759.50
79-94-7	Tetrabromobisphenol A	48	54,004.91	9.00	0.00	0.00	0.00	196,675.00	250,688.91	625,481.75	876,170.66
	Total	**15,794**	**3,024,365.00**	**433,047.31**	**208,019.97**	**6,035,051.53**	**21,066,989.83**	**365,804,742.12**	**396,572,215.77**	**57,844,139.84**	**454,416,355.61**

Note: On-site Releases are from Section 5 of Form R. **Off-site Releases** are from Section 6 (transfers off-site to disposal) of Form R. **Off-site Releases** include metals and metal category compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. **Off-site Releases** do not include transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release.
* The chemical category dioxin and dioxin-like compounds is reported in grams. Where the category dioxin and dioxin-like compounds is shown on a table with other TRI chemicals, it is presented in pounds. The grams are converted to pounds by multiplying by 0.002205.

On- and Off-site Releases of PBT Chemicals

PBT chemicals accounted for 454.4 million pounds of total on- and off-site releases in 2001. (See Table ES-5.) On-site land releases, totaling 386.9 million pounds, were 85 percent of total releases of PBT chemicals in 2001. Of the on-site land releases, RCRA subtitle C landfills accounted for 21.1 million pounds, with other on-site land releases totaling 365.8 million pounds. Off-site releases (transfers off-site to disposal) were 57.8 million pounds, representing 13 percent of the total releases of PBT chemicals in 2001.

On-site underground injection of PBT chemicals in 2001 was 6.2 million pounds, total air emissions were 3.0 million pounds, and surface water discharges of PBT chemicals totaled less than 440,000 pounds.

Of the 454.4 million pounds of total on- and off-site releases of PBT chemicals, lead and lead compounds constituted 97 percent (443.0 million pounds) of the total in 2001. On- and off-site releases of mercury and mercury compounds totaled 4.9 million pounds, polycyclic aromatic compounds totaled 3.0 million pounds, and polychlorinated biphenyls totaled 2.5 million pounds.

Table ES-6: Quantities of TRI Chemicals in Waste by Waste Management Activity, 2001

Waste Management Activity	Pounds	Percent
Recycled On-site	7,558,346,576	28.3
Recycled Off-site	1,970,123,256	7.4
Energy Recovery On-site	2,646,959,925	9.9
Energy Recovery Off-site	826,420,385	3.1
Treated On-site	6,931,390,303	25.9
Treated Off-site	626,325,057	2.3
Quantity Released On- and Off-site	6,176,026,135	23.1
Total Production-related Waste Managed	**26,735,591,638**	**100.0**
Non-production-related Waste Managed	56,889,153	

Note: Data are from Section 8 of Form R for 2001.

Forms for the dioxin and dioxin-like compounds category represented 8 percent (1,320 out of 15,794) of all the PBT chemicals forms for 2001. Dioxin and dioxin-like compounds are reported in grams and subject to a lower reporting threshold (0.1 grams) than the other PBT chemicals. Almost 148,759 grams of total releases of dioxin and dioxin-like compounds were reported for 2001. Over 60 percent of total releases of dioxin and dioxin-like compounds were released off-site as transfers to disposal. Of the on-site releases, almost three-quarters (74 percent) were other on-site land releases, that is on-site land releases to other than RCRA subtitle C landfills, such as other types of landfills, surface impoundments, and land treatment.

More detailed information on releases of PBT chemicals, including dioxin and dioxin-like compounds, can be found in Chapter 3 of this report.

Waste Management Data, 2001

A total of 26.74 billion pounds of TRI chemicals in production-related waste was reported as managed during 2001. Almost 7.56 billion pounds of toxic chemicals in production-related waste were recycled on-site in 2001, representing 28 percent of all toxic chemicals in production-related waste. (See Table ES-6.)

Another 6.93 billion pounds were treated on-site, accounting for 26 percent of the toxic chemicals in production-related waste managed in 2001. Almost 6.18 million pounds (23 percent) were released on- and off-site. On-site energy recovery constituted 2.65 billion pounds or 10 percent while off-site recycling was 1.97 billion pounds or 7 percent. Off-site energy recovery and off-site treatment each accounted for 3 percent or less of the total toxic chemicals in production-related waste managed in 2001.

Quantities of TRI Chemicals in Waste by State

Texas, followed by Louisiana and Illinois reported the largest quantity of toxic chemicals in production-related waste managed in 2001. With more than 1.5 billion pounds each, these three states accounted for 30 percent of all toxic chemicals in production-related waste in 2001. (See Table ES-7.)

Texas reported the largest amount of toxic chemicals in production-related waste, with 3.96 billion pounds or 15 percent of the total for 2001. Texas also reported the largest amount of TRI chemicals in waste treated on-site, with 1.75 billion pounds or 25 percent of all on-site treatment in 2001. Facilities in Texas also reported the largest amount of on-site energy recovery, with 875.9 million pounds or 33 percent of all TRI chemicals in waste burned for energy recovery on-site.

Louisiana, with 2.3 billion pounds of toxic chemicals in production-related waste, accounted for 8 percent of the total. Facilities in Louisiana reported the second largest amounts treated on-site (1.09 billion pounds) and the second largest amounts of on-site energy recovery (316.8 million pounds).

Illinois was the state with the third largest quantity of toxic chemicals in production-related waste, with 1.91 billion pounds or 7 percent of total toxic chemicals in production-related waste in 2001.

Table ES-7: Quantities of TRI Chemicals in Waste by State, 2001

State	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
Alabama	818,525,464	42,141,345	55,906,584	23,619,563	226,084,174	22,101,850	138,399,983	1,326,778,962	70,451
Alaska	1,377,417	34,652	450,000	108,217	2,769,603	2,955	521,478,368	526,221,212	17,994
American Samoa	0	0	129	0	0	0	6,920	7,049	10
Arizona	58,925,877	18,509,833	422,012	488,202	10,710,007	2,511,844	608,214,311	699,782,085	79,115
Arkansas	109,446,061	60,384,333	42,487,541	43,829,050	121,966,236	4,996,906	48,247,951	431,358,077	1,996,835
California	58,257,511	74,760,095	35,102,596	22,947,133	100,816,156	27,460,378	64,185,642	383,529,510	580,159
Colorado	24,177,383	28,466,735	1,949,019	3,849,371	16,184,490	2,786,980	37,881,583	115,295,561	187,376
Connecticut	4,239,712	32,308,816	2,926,379	2,537,184	13,535,252	11,717,728	10,335,253	77,600,324	1,108,832
Delaware	24,133,520	8,721,191	25,863,740	2,642,626	40,675,792	1,726,890	11,953,371	115,717,130	163,168
District of Columbia	209	6,377	0	0	987	371	63,498	71,442	0
Florida	76,259,500	19,936,397	19,979,890	3,015,888	157,719,630	9,715,870	120,787,838	407,415,013	478,639
Georgia	107,978,360	33,470,615	55,953,246	12,622,865	146,733,814	8,785,811	117,391,931	482,936,642	628,759
Guam	0	0	0	0	0	26	198,339	198,365	142
Hawaii	290,115	46,914	0	484	364,278	2,057	3,135,249	3,839,097	9
Idaho	3,605,397	2,170,398	1,460,012	65,714	25,599,902	1,168,130	72,545,710	106,615,263	1,892,372
Illinois	1,348,544,000	102,625,703	37,420,571	29,460,078	225,908,101	22,002,704	146,988,389	1,912,949,546	545,619
Indiana	163,252,657	167,198,128	191,884,163	14,341,052	243,043,965	13,652,032	208,328,798	1,001,700,794	318,766
Iowa	213,121,679	42,711,679	748,473	4,134,190	40,216,595	10,570,453	45,144,138	356,647,207	222,407
Kansas	64,249,515	30,853,868	31,460,150	4,798,455	34,519,541	43,288,598	31,315,170	240,485,297	129,439
Kentucky	242,266,568	45,970,185	63,137,385	30,778,647	191,201,719	13,224,631	92,168,977	678,748,112	2,253,885
Louisiana	637,089,592	36,112,363	316,777,954	13,451,035	1,091,501,679	33,552,502	133,028,144	2,261,513,268	651,905
Maine	688,744	3,151,433	11,562,908	179,633	55,972,108	829,474	10,443,082	82,827,382	8,622
Maryland	10,284,862	9,430,974	7,849,613	2,133,854	50,183,694	9,327,009	45,523,468	134,733,474	791,777
Massachusetts	12,026,251	22,396,576	4,548,040	4,392,581	21,771,030	13,646,998	12,714,415	91,495,891	57,905
Michigan	101,296,499	89,483,441	9,885,512	187,813,997	105,470,376	34,797,894	131,636,741	660,384,461	141,624
Minnesota	177,218,187	20,369,261	1,725,850	1,742,186	70,831,646	16,683,765	32,817,974	321,388,869	688,794
Mississippi	161,638,689	26,687,871	55,310,964	4,406,110	95,243,267	4,003,560	71,475,274	418,765,736	286,446
Missouri	304,207,614	48,514,126	99,253,396	17,564,464	65,815,093	13,598,100	119,400,915	668,353,708	168,177
Montana	8,626,607	62,534	3,948,532	41,063	10,499,243	36,449	51,214,536	74,428,965	12,029,507
Nebraska	1,593,131	17,484,015	5,200	575,939	51,643,357	1,810,885	36,594,812	109,707,339	41,484
Nevada	45,728,151	2,184,376	993,336	56,709	57,883,317	59,629	783,492,191	890,397,708	11,424
New Hampshire	2,348,318	10,584,760	879,040	1,710,684	3,727,050	735,962	5,224,889	25,210,703	38,846
New Jersey	59,939,298	23,907,690	6,403,815	57,979,795	145,287,049	36,121,594	31,854,796	361,494,038	282,988
New Mexico	1,531,999	3,789,504	27,756,266	74,011	9,996,538	503,881	107,869,053	151,521,252	2,359,540
New York	113,439,403	67,997,882	35,671,806	4,485,007	99,244,224	10,424,862	46,426,593	377,689,778	1,229,894
North Carolina	248,360,511	96,054,465	33,635,298	10,881,206	116,570,037	8,786,214	147,535,797	661,823,529	440,744
North Dakota	950	731,887	0	19,879	5,534,778	553,161	25,990,159	32,830,814	15,005
Northern Marianas	0	0	0	0	0	0	7,953	7,953	0
Ohio	185,819,144	168,455,967	81,101,178	37,992,825	271,064,524	34,819,545	263,377,456	1,042,630,639	198,808
Oklahoma	56,654,350	20,705,689	64,445,608	2,000,748	38,660,757	2,232,749	28,816,690	213,516,591	185,842
Oregon	22,101,690	13,281,298	14,813,876	2,053,144	42,316,360	10,049,902	46,747,723	151,363,993	147,532
Pennsylvania	477,399,211	158,199,932	131,904,573	17,269,580	197,111,878	22,515,192	185,454,422	1,189,854,789	1,116,636
Puerto Rico	19,669,024	13,442,118	65,813	37,125,971	30,653,787	13,442,163	15,581,867	129,980,743	26,548
Rhode Island	12,481,984	10,014,959	422,570	476,133	5,071,277	1,305,442	1,192,889	30,965,255	12,835
South Carolina	393,865,233	79,100,303	109,669,239	31,907,639	156,322,777	10,506,996	92,460,423	873,832,609	561,487
South Dakota	409,644	1,303,774	447,276	264,391	7,213,388	237,900	13,419,785	23,296,158	107,756
Tennessee	164,851,023	79,017,354	96,119,122	7,158,004	178,291,980	5,560,004	162,366,020	693,363,507	162,870
Texas	689,703,872	136,892,811	875,947,403	141,426,391	1,747,035,703	97,450,247	274,862,593	3,963,319,020	12,156,179
Utah	146,169,795	2,710,383	2,719,020	73,466	78,768,765	1,226,624	764,952,754	996,620,807	10,579,265
Vermont	145,571	1,582,246	0	291,536	1,228,475	680,982	314,782	4,243,592	20,208
Virgin Islands	796,297	121,886	0	2,894	22,964,543	713	1,035,223	24,921,556	3,651
Virginia	94,850,493	27,992,872	27,825,485	8,615,846	140,163,993	20,535,606	79,923,229	399,907,524	89,462
Washington	12,662,851	9,974,266	11,916,690	2,561,137	64,744,283	4,485,227	26,302,988	132,647,442	250,693
West Virginia	39,403,298	7,317,538	33,525,628	11,401,247	168,522,361	6,481,176	80,107,693	346,758,940	1,226,288
Wisconsin	35,376,355	50,653,416	12,651,183	19,038,396	114,303,043	13,600,784	48,914,984	294,538,161	124,326
Wyoming	1,316,993	96,021	25,841	14,167	11,727,681	5,653	18,172,402	31,358,758	106
Total	**7,558,346,576**	**1,970,123,256**	**2,646,959,925**	**826,420,385**	**6,931,390,303**	**626,325,057**	**6,176,026,135**	**26,735,591,638**	**56,889,153**

Note: Data are from Section 8 of Form R.

Table ES-8: Quantities of TRI Chemicals in Waste by Industry, 2001

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	Off-site	On-site	Off-site	On-site	Off-site			
		Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
10	Metal Mining	32,735,928	1,263,828	0	98,030	54,832,294	6,403	2,780,689,913	2,869,626,395	714,674
12	Coal Mining	32,251	7,985	0	0	359,348	0	16,082,410	16,481,994	2,356,746
20	Food	768,924,832	2,870,076	1,182,619	156,802	154,663,793	35,273,137	127,006,561	1,090,077,820	465,658
21	Tobacco	2,817	13,677	0	0	1,439,725	600,496	3,253,265	5,309,980	0
22	Textiles	12,707,442	874,373	4,275,378	1,974,199	12,165,812	1,946,084	6,771,563	40,714,851	27,389
23	Apparel	94,870	60,241	0	82,786	1,172,336	14,963	378,264	1,803,460	0
24	Lumber	6,976,869	837,875	5,484,051	5,027,675	18,631,134	1,033,556	31,211,793	69,202,953	421,385
25	Furniture	375,035	3,477,898	62,251	1,783,425	748,891	311,095	8,300,142	15,058,736	93,634
26	Paper	64,794,501	2,934,559	174,986,780	5,624,222	887,320,219	43,334,921	195,392,896	1,374,388,098	197,728
27	Printing	205,498,797	12,411,421	548,843	3,446,972	127,016,206	1,759,923	20,011,194	370,693,356	59,373
28	Chemicals	4,159,511,539	165,873,509	1,357,077,773	406,079,947	3,657,842,228	355,033,082	586,661,036	10,688,079,114	3,949,337
29	Petroleum	95,286,627	24,168,037	282,794,445	2,622,753	389,842,342	11,069,216	72,833,689	878,617,109	729,776
30	Plastics	34,663,998	13,371,548	23,361,474	7,495,115	29,225,379	8,681,449	88,826,986	205,625,949	77,391
31	Leather	389,441	194,391	577	18,862	4,569,954	414,703	2,819,230	8,407,158	7,492
32	Stone/Clay/Glass	140,883,189	4,782,655	449,089,243	1,710,176	11,569,542	4,085,265	41,063,310	653,183,379	443,947
33	Primary Metals	1,342,465,964	676,045,362	167,015,143	3,316,752	318,408,207	21,056,802	572,405,099	3,100,713,329	37,376,955
34	Fabricated Metals	113,773,998	335,301,136	18,296,498	11,612,043	94,780,676	20,629,110	66,635,591	661,029,051	1,068,942
35	Machinery	9,212,032	95,700,300	28,694	1,600,771	4,656,719	2,851,195	16,377,983	130,427,694	269,426
36	Electrical Equip.	173,618,308	290,940,156	9,637,045	7,649,807	57,953,018	22,476,081	30,163,404	592,437,820	216,785
37	Transportation Equip.	11,158,752	114,151,281	2,609,230	10,935,477	27,426,980	13,050,299	80,710,311	260,042,330	2,254,610
38	Measure./Photo.	1,615,085	10,444,620	269,790	1,857,568	36,510,399	2,271,164	9,597,623	62,566,249	315,151
39	Miscellaneous	7,645,234	12,456,340	4,021,273	1,348,756	4,092,063	3,340,271	7,862,955	40,766,891	826,556
--	Multiple codes 20-39	225,086,802	160,309,820	137,286,267	21,285,530	277,941,861	37,706,531	106,940,404	966,557,214	948,412
--	No codes 20-39	2,636,747	3,745,287	180,654	998,403	6,615,379	1,378,008	11,956,379	27,510,857	2,034,249
491/493	Electric Utilities	2,835,782	6,962,529	1,645,552	682	488,117,685	20,469	1,061,541,493	1,561,124,192	1,752,578
5169	Chemical Wholesale Distributors	17,596,767	54,251	22	15,302,011	799,278	5,779,256	1,547,913	41,079,498	167,552
5171	Petroleum Bulk Terminals/Bulk Storage	23,579,074	8,948,927	33,089	205,550	8,673,139	1,407,942	3,430,424	46,278,144	87,497
7389/4953	Hazardous Waste/Solvent Recovery	104,243,895	21,921,175	7,073,234	314,186,073	254,015,699	30,793,637	225,554,305	957,788,017	25,910
	Total	**7,558,346,576**	**1,970,123,256**	**2,646,959,925**	**826,420,385**	**6,931,390,303**	**626,325,057**	**6,176,026,135**	**26,735,591,638**	**56,889,153**

Note: Data are from Section 8 of Form R.

Facilities/forms are included in the manufacturing industry categories (SIC Codes 20-39) if they did not report a SIC code in the other industries. Forms that reported more than one 2-digit SIC code within the range 20 to 39 are assigned to the "multiple codes" category. Facilities/forms are included in the other industry categories if the facility/form has a SIC code in the other industries 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 manufacturing and other industry SIC codes, then the facility/form is included in the manufacturing industry category. If the facility reported for the first time in 1998 or later and the facility/form has a combination of manufacturing and other industry SIC codes, then the facility/form is included in the other industry category. Forms with no 2-digit SIC code are included in the “no codes 20-39” category. One facility, Phelps Dodge Miami of Claypool, AZ, that reported under SIC code 33 and SIC code 10 in 2001 and previous years has been included in SIC code 10 for the purpose of this analysis.

Facilities in Illinois reported the largest amount recycled on-site, with 1.35 billion pounds or 18 percent of total on-site recycling in 2001.

Nevada facilities reported the largest quantities of TRI chemicals in waste released on- and off-site in 2001, with 783.5 million pounds or 13 percent of the total released on- and off-site. Nevada ranked ninth overall for total toxic chemicals production-related waste, with 890.4 million pounds.

Quantities of TRI Chemicals in Waste by Industry

The chemical manufacturing industry reported the largest quantity of toxic chemicals in production-related waste managed in 2001, with 10.69 billion pounds or 40 percent of the total reported by all industries. (See Table ES-8.) Chemical manufacturers reported the largest amounts recycled on-site, used for energy recovery on- and off-site, and treated on- and off-site. With 4.16 billion pounds recycled on-site, the chemicals industry accounted for 55 percent of all on-site recycling in 2001. This industry also reported 3.66 billion pounds treated on-site (53 percent of total on-site treatment), 1.36 billion pounds of on-site energy recovery (51 percent of total on-site energy recovery), and 406.1 million pounds of off-site energy recovery (49 percent of total off-site energy recovery).

The primary metals industry reported the second largest quantity of toxic chemicals in production-related waste managed in 2001, with 3.10 billion pounds or 12 percent of the total. Primary metals facilities reported the largest quantity of TRI chemicals in waste recycled off-site, with 676.0

million pounds or 34 percent of all off-site recycling, and the second largest on-site recycling, with 1.34 billion pounds (18 percent of all on-site recycling).

The metal mining industry reported the third largest quantities of toxic chemicals in production-related waste and the largest quantity released on- and off-site in 2001. With 2.87 billion pounds, metal mining facilities accounted for 11 percent of toxic chemicals in production-related waste managed by all industries in 2001. Most (97 percent) of the toxic chemicals in production-related waste managed by metal mining facilities was released on-and off-site. The 2.78 billion pounds released on- and off-site by the metal mining industry in 2001 accounted for 45 percent of all TRI chemicals in waste released on- and off-site in 2001.

Electric utilities reported the fourth largest amount of toxic chemicals in production-related waste in 2001, with 1.56 billion pounds, representing 6 percent of the total managed. This industry reported the second largest amount released on- and off-site, with 1.06 billion pounds or 17 percent of the quantity released on- and off-site by all industries in 2001.

Quantities of TRI Chemicals in Waste by Chemical

Table ES-9 lists the 20 TRI chemicals managed in production-related waste in 2001 in the largest quantities. Production-related waste managed of the top 20 TRI chemicals totaled 19.29 billion pounds, 72 percent of all toxic chemicals in production-related waste of all TRI chemicals.

On-site recycling of the top 20 TRI chemicals totaled 5.82 billion pounds, representing 77 percent all on-site recycling of all TRI chemicals in 2001. On-site treatment was 5.06 billion pounds or 73 percent of total on-site treatment for all TRI chemicals. The quantity released on- and off-site of the top 20 TRI chemicals constituted 4.44 billion pounds, representing 72 percent of the total releases on- and off-site in 2001.

Of the 19.29 billion pounds of the top 20 TRI chemicals in production-related waste, 30 percent was recycled on-site, 26 percent was treated on-site and 23 percent was released on- and off-site.

The TRI chemical managed in waste in the largest quantities in 2001 was methanol, with 2.33 billion pounds, accounting for 9 percent of toxic chemicals

Table ES-9: Top 20 Chemicals with the Largest Total Production-related Waste, 2001

CAS Number	Chemical	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
		On-site	Off-site	On-site	Off-site	On-site	Off-site			
		Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
67-56-1	Methanol	512,628,730	33,930,506	396,146,801	152,279,030	938,972,857	116,154,534	180,899,209	2,331,011,667	224,346
108-88-3	Toluene	1,017,876,688	37,638,485	182,640,178	147,740,286	303,738,267	23,503,497	74,807,577	1,787,944,977	668,782
7647-01-0	Hydrochloric acid	66,597,953	666,508	3,474,181	9,721	841,654,109	4,093,004	587,609,582	1,504,105,058	231,580
--	Zinc compounds	84,963,627	274,345,019	140,775	40,538	10,462,553	2,697,732	982,854,573	1,355,504,817	5,393,968
--	Copper compounds	143,657,931	106,728,311	0	12,305	421,761	632,410	1,012,319,638	1,263,772,355	9,414,992
74-85-1	Ethylene	127,322,652	442	469,015,809	16,270,592	612,552,699	8,052,470	23,591,956	1,256,806,620	473,294
7440-50-8	Copper	489,376,136	573,888,780	0	2,128	331,409	936,215	23,466,362	1,088,001,030	812,440
110-54-3	n-Hexane	775,131,057	8,343,536	38,584,286	24,231,336	67,546,836	7,037,691	49,319,091	970,193,833	203,916
--	Lead compounds	360,989,109	196,407,911	87,740	107,720	63,447	761,999	407,376,182	965,794,108	18,044,640
98-82-8	Cumene	817,515,105	122,530	5,041,374	1,276,359	7,167,513	132,066	1,315,128	832,570,075	3,467
7664-41-7	Ammonia	121,839,483	7,679,782	125,788,947	139,878	370,090,277	15,048,231	159,845,477	800,432,076	593,541
115-07-1	Propylene	25,694,779	25	282,717,411	85,357	461,181,800	14,093,926	13,793,661	797,566,959	203,649
--	Nitrate compounds	83,215,827	786,458	0	71,975	166,171,227	178,880,408	272,004,175	701,130,070	846,635
7664-93-9	Sulfuric acid	38,353,227	640,324	6,225	34,500	395,096,005	991,808	148,183,112	583,305,201	256,304
107-21-1	Ethylene glycol	376,084,469	75,745,755	4,184,282	14,351,166	56,603,714	28,816,768	10,186,122	565,972,276	95,255
107-06-2	1,2-Dichloroethane	430,010,562	2,343,199	34,886,848	750,931	90,547,449	2,855,698	465,782	561,860,469	21,893
7782-50-5	Chlorine	155,857,244	14,303	14,646,699	50,600	364,287,065	535,275	16,700,285	552,091,471	126,642
1330-20-7	Xylene (mixed isomers)	106,413,584	31,701,371	92,846,853	116,238,710	65,780,111	15,708,374	50,788,556	479,477,559	567,440
--	Manganese compounds	23,174,873	46,947,185	3,748	0	846,053	521,713	406,131,471	477,625,043	2,528,743
7697-37-2	Nitric acid	64,955,578	1,947,737	0	3,383	309,588,845	13,266,297	21,919,421	411,681,261	500,036
	Subtotal (top 20 chemicals)	**5,821,658,614**	**1,399,878,167**	**1,650,212,157**	**473,696,514**	**5,063,103,997**	**434,720,116**	**4,443,577,361**	**19,286,846,925**	**41,211,562**
	Total (all chemicals)	**7,558,346,576**	**1,970,123,256**	**2,646,959,925**	**826,420,385**	**6,931,390,303**	**626,325,057**	**6,176,026,135**	**26,735,591,638**	**56,889,153**

Note: Data are from Section 8 of Form R.

in production related-waste. Methanol was the chemical treated on-site in the largest amounts (939.0 million pounds or 14 percent of all on-site treatment). Toluene was managed in waste in the second largest amounts, with 1.79 billion pounds, representing 7 percent of the total for all chemicals. Toluene was recycled on-site in the largest amounts. Almost 1.02 billion pounds of toluene was recycled on-site, accounting for 13 percent of all on-site recycling in 2001.

The TRI chemical with the largest quantity released on- and off-site was copper compounds with 1.01 billion pounds, accounting for 16 percent of all releases on- and off-site in 2001. Copper compounds ranked fifth for total toxic chemicals managed in production-related waste. Zinc compounds were released on- and off-site in the second largest amounts, with 982.9 million pounds, and ranked fourth for total toxic chemicals managed in production-related waste. Hydrochloric acid was released on- and off-site in the third largest amount, with 587.6 million pounds and ranked third for total toxic chemicals managed in production-related waste and second for on-site treatment.

Quantities of PBT Chemicals in Waste

A total of 1.28 billion pounds of PBT chemicals was reported as managed in waste during 2001. Over 546.6 million pounds of PBT chemicals in waste were recycled on-site, another 440.1 million pounds were released on- and off-site, and 259.8 million pounds were recycled off-site. (See Table ES-10.)

Table ES-10: Quantities of TRI Chemicals in Waste, PBT Chemicals, 2001

CAS Number	Chemical	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
--	**Dioxin and dioxin-like compounds***	**3.27**	**0.23**	**0.03**	**6.09**	**516.62**	**118.13**	**340.50**	**984.86**	**29.13**
--	*Dioxin and dioxin-like compounds (in grams)**	*1,484.197*	*102.870*	*11.524*	*2,760.403*	*234,296.365*	*53,572.009*	*154,421.201*	*446,648.570*	*13,212.890*
	Lead and Lead Compounds	**543,676,920.880**	**258,775,081.959**	**96,065.614**	**119,025.670**	**1,259,679.530**	**1,002,539.673**	**428,651,479.574**	**1,233,580,792.900**	**18,333,736.003**
7439-92-1	Lead	182,687,811.78	62,367,170.76	8,326.00	11,306.00	1,196,232.44	240,541.13	21,275,297.20	267,786,685.31	289,096.40
--	Lead compounds	360,989,109.10	196,407,911.20	87,739.61	107,719.67	63,447.09	761,998.55	407,376,182.37	965,794,107.59	18,044,639.60
	Mercury and Mercury Compounds	**735,096.829**	**161,542.342**	**77.000**	**1.800**	**10,862.961**	**37,796.802**	**4,873,159.631**	**5,818,537.365**	**16,014.155**
7439-97-6	Mercury	304,798.30	75,943.07	77.00	1.80	30.21	33,619.33	104,363.91	518,833.63	3,447.20
--	Mercury compounds	430,298.53	85,599.27	0.00	0.00	10,832.75	4,177.47	4,768,795.72	5,299,703.74	12,566.96
	Polycyclic aromatic compounds	**2,181,079.520**	**860,183.755**	**10,401,981.016**	**178,811.785**	**8,181,690.388**	**180,866.390**	**3,017,847.935**	**25,002,460.787**	**18,875.049**
191-24-2	Benzo(g,h,i)perylene	140,586.01	37,229.40	808,168.96	3,744.11	199,443.74	1,911.27	122,772.28	1,313,855.78	1,565.82
--	Polycyclic aromatic compounds	2,040,493.51	822,954.35	9,593,812.06	175,067.67	7,982,246.65	178,955.12	2,895,075.65	23,688,605.01	17,309.23
1336-36-3	**Polychlorinated biphenyls (PCBs)**	**355.10**	**121.88**	**400.00**	**54.40**	**1,310,735.30**	**270,767.30**	**2,545,407.33**	**4,127,841.31**	**23,202.59**
	Pesticides	**13,702.00**	**3.00**	**1,996.00**	**2,649.20**	**2,410,597.72**	**115,391.20**	**115,494.02**	**2,659,833.14**	**679.02**
309-00-2	Aldrin	0.00	0.00	0.00	306.00	58,529.00	24.00	18.38	58,877.38	0.00
57-74-9	Chlordane	0.00	0.00	244.00	0.00	463,839.30	457.00	4,024.29	468,564.59	0.00
76-44-8	Heptachlor	0.00	0.00	45.00	334.00	751,861.74	173.00	305.73	752,719.47	0.02
465-73-6	Isodrin	0.00	0.00	0.00	0.00	3,800.00	142.00	465.19	4,407.19	0.00
72-43-5	Methoxychlor	0.00	0.00	569.00	1,376.00	319,545.30	231.40	12,093.69	333,815.39	0.00
40487-42-1	Pendimethalin	6,000.00	0.00	0.00	0.00	390,997.29	34,656.00	71,546.00	503,199.29	0.00
8001-35-2	Toxaphene	0.00	3.00	1,138.00	7.20	124,183.14	464.80	4,378.99	130,175.13	0.00
1582-09-8	Trifluralin	7,702.00	0.00	0.00	626.00	297,841.95	79,243.00	22,661.75	408,074.70	679.00
	Other PBTs	**5,964.10**	**2,525.00**	**370,079.64**	**6,551.30**	**6,810,472.85**	**94,940.38**	**906,015.92**	**8,196,549.19**	**12,384.33**
118-74-1	Hexachlorobenzene	5,400.10	1,432.00	369,749.64	2,132.80	6,269,768.60	41,542.86	48,534.45	6,738,560.45	9,310.49
29082-74-4	Octachlorostyrene	0.00	0.00	0.00	0.00	8.00	0.00	701.72	709.72	0.00
608-93-5	Pentachlorobenzene	8.00	770.00	330.00	1,491.00	445,846.25	1,307.52	2,759.93	452,512.70	3,073.84
79-94-7	Tetrabromobisphenol A	556.00	323.00	0.00	2,927.50	94,850.00	52,090.00	854,019.81	1,004,766.31	0.00
	Total	**546,613,121.70**	**259,799,458.16**	**10,870,599.30**	**307,100.24**	**19,984,555.37**	**1,702,419.87**	**440,109,744.91**	**1,279,386,999.55**	**18,404,920.28**

Note: Data are from Section 8 of Form R.
* The chemical category dioxin and dioxin-like compounds is reported in grams. Where the category dioxin and dioxin-like compounds is shown on a table with other TRI chemicals, it is presented in pounds. The grams are converted to pounds by multiplying by 0.002205.

Over 1.23 billion pounds of lead and lead compounds in production-related waste, representing 96 percent of all production-related waste of PBTs, was managed in 2001. There was 25 million pounds of polycyclic aromatic compounds in production-related waste (2 percent of the total for PBT chemicals). There was 6.7 million pounds of hexachlorobenzene, 5.8 million pounds of mercury and mercury compounds, 4.1 million pounds of polychlorinated biphenyls and 2.7 million pounds of pesticides managed in waste.

Dioxin and dioxin-like compounds in production-related waste managed totaled almost 446,649 grams for 2001. Dioxin and dioxin-like compounds are reported in grams and subject to a lower reporting threshold (0.1 grams) than the other PBT chemicals. Over half (52 percent or 234,296 grams) of the dioxin and dioxin-like compounds in waste were treated on-site with most of the remaining released on- and off-site (154,421 grams).

More detailed information on PBT chemicals, including dioxin and dioxin-like compounds, can be found in Chapter 3 of this report.

Transfers for Further Waste Management, including Disposal

A total of 4.08 billion pounds of TRI chemicals in waste was transferred off-site for further waste management, including disposal, in 2001. (See Table ES-11.) Transfers off-site to recycling total 1.95 billion pounds or 48 percent of all transfers for further waste management, including disposal. Another 840.3 million pounds, accounting for 21 percent, were transfers to energy recovery.

Other off-site transfers to disposal were 664.3 million pounds or 16 percent of total transfers for further waste management in 2001. Transfers to POTWs were 339.9 million pounds or 8 percent of the total, and transfers to treatment were 279.7 million pounds or 7 percent.

Projections of TRI Chemicals in Waste and Source Reduction

TRI facilities expected to decrease their quantities of toxic chemicals in production-related waste managed between 2001 and 2003 by less than one percent, from 25.50 billion pounds to 25.34 billion pounds. The projected totals were 24.95 billion pounds for 2002, a decrease of just over 2 percent from 2001 to 2002 and 25.34 billion pounds for 2003, an increase of just under 2 percent from 2002 to 2003.[2] (See Table ES-12.) The decrease was projected to occur within on-site recycling, off-site energy recovery, on-site treatment, and the quantity released on- and off-site. On-site recycling, with 7.01 billion pounds in 2001, was expected to decline by less than one percent by 2003. Off-site energy recovery, with 826.3 million pounds in 2001, was expected to decline by 5 percent by 2003. On-site treatment, with 6.93 billion pounds in 2001, was expected to decline by less than one percent.

Table ES-11: TRI Transfers Off-site for Further Waste Management, including Disposal, 2001

Type of Transfer	Pounds	Percent
Transfers to Recycling	1,950,840,492	47.9
Transfers to Energy Recovery	840,332,852	20.6
Transfers to Treatment	279,686,495	6.9
Transfers to POTWs	339,913,774	8.3
Metals and Metal Category Compounds Only	2,211,172	0.1
Non-metal TRI Chemicals	337,702,602	8.3
Other Off-site Transfers*	1,781,068	0.04
Other Off-site Transfers to Disposal**	664,339,613	16.3
Total Transfers for Further Waste Management, including Disposal	**4,076,894,294**	**100.0**

Note: Transfers Off-site for Further Waste Management, including Disposal are from Section 6 of Form R.
* Other Off-site Transfers are transfers reported without a valid waste management code.
** Does not include transfers to POTWs of metals and metal category compounds.

[2] The reporting thresholds for lead and lead compounds were lowered for 2001. The amounts reported for these chemicals have been omitted from this table since facilities reporting on lead and lead compounds for the first time in 2001 may not have reported an amount for 2000 on the 2001 TRI Form R

Table ES-12: Prior Year, Current Year and Projected Quantities of TRI Chemicals in Waste, 2000-2003

Waste Management Activity	Prior Year 2000		Current Year 2001		Projected 2002		Projected 2003	
	Total Pounds	Percent of Total	Total Pounds	Percent of Total	Total Pounds	Percent of Total	Total Pounds	Percent of Total
Recycled On-site	7,506,278,723	27.0	7,014,669,655	27.5	6,899,323,467	27.7	6,976,781,188	27.5
Recycled Off-site	1,827,604,200	6.6	1,711,348,174	6.7	1,673,184,096	6.7	1,721,512,047	6.8
Energy Recovery On-site	2,796,796,450	10.1	2,646,863,860	10.4	2,776,164,895	11.1	2,877,192,619	11.4
Energy Recovery Off-site	786,700,685	2.8	826,301,360	3.2	778,996,234	3.1	781,416,547	3.1
Treated On-site	8,213,134,666	29.6	6,930,130,624	27.2	6,801,501,525	27.3	6,880,003,751	27.2
Treated Off-site	596,629,742	2.1	625,322,518	2.5	651,794,364	2.6	648,521,181	2.6
Quantity Released On- and Off-site	6,053,625,041	21.8	5,747,374,655	22.5	5,370,005,033	21.5	5,454,490,609	21.5
Total Production-related Waste Managed	**27,780,769,507**	**100.0**	**25,502,010,846**	**100.0**	**24,950,969,614**	**100.0**	**25,339,917,942**	**100.0**

Waste Management Activity	Change 2000-2001 Percent	Projected Change 2001-2002 Percent	Projected Change 2002-2003 Percent	Projected Change 2001-2003 Percent
Recycled On-site	-6.5	-1.6	1.1	-0.5
Recycled Off-site	-6.4	-2.2	2.9	0.6
Energy Recovery On-site	-5.4	4.9	3.6	8.7
Energy Recovery Off-site	5.0	-5.7	0.3	-5.4
Treated On-site	-15.6	-1.9	1.2	-0.7
Treated Off-site	4.8	4.2	-0.5	3.7
Quantity Released On- and Off-site	-5.1	-6.6	1.6	-5.1
Total Production-related Waste Managed	**-8.2**	**-2.2**	**1.6**	**-0.6**

Note: Does not include lead and lead compounds. Data from Section 8 of Form R for 2001.

Two facilities made errors in reporting the quantity released on- and off-site. One facility reported 6,500,022,100 pounds for 2000; the correct number is 65,000 pounds. One facility reported 4,976,250,100 pounds for 2002; the correct number is 49,762 pounds. These corrections were received too late to be included in the publicly released database, but they have been included in this table.

The quantity released on- and off-site was expected to decline by 5 percent, from 5.75 billion pounds to 5.45 billion pounds. The quantity released on- and off-site decreased by 5 percent from 2000 to 2001. On- and off-site releases are the least-desirable outcome under the waste management hierarchy described in **Waste Management** in Chapter 1 (Figure 1-2).

Off-site recycling, on-site energy recovery and off-site treatment were expected to increase from 2001 to 2003. Off-site recycling was projected to increase by less than one percent, from 1.71 billion pounds in 2001 to 1.72 billion pounds in 2003. Off-site recycling decreased by 6 percent from 2000 to 2001. On-site energy recovery was projected to increase by 9 percent from 2001 to 2003, from 2.65 billion pounds to 2.88 billion pounds. On-site energy recovery decreased by 5 percent from 2000 to 2001. Off-site treatment was expected to increase by 4 percent, from 625.3 million pounds to 648.5 million pounds. Off-site treatment increased by 5 percent from 2000 to 2001.

In 2001, 4,534 of the 22,359 TRI facilities submitting a Form R reported undertaking one or more source reduction activities. As noted in **Waste Management** in Chapter 1, source reduction—an activity that prevents the generation of waste—is preferred to waste management. These 4,534 facilities represented 20.3 percent of the TRI facilities submitting a Form R in 2001. (See Table ES-13.)

Table ES-13: Facilities and Forms Reporting Source Reduction Activity by Category, 2001

Source Reduction Activity	Facilities Reporting Source Reduction Activity as Percent of TRI Facilities Reporting Form Rs*		Forms Reporting Source Reduction Activity as Percent of TRI Forms Reporting Form Rs*	
	Number	Percent	Number	Percent
Good Operating Practices	2,218	9.9	6,474	7.8
Inventory Control	546	2.4	1,305	1.6
Spill and Leak Prevention	917	4.1	2,887	3.5
Raw Materials Modifications	1,020	4.6	1,680	2.0
Process Modifications	1,576	7.0	3,719	4.5
Cleaning and Degreasing	325	1.5	574	0.7
Surface Preparation and Finishing	481	2.2	983	1.2
Product Modifications	392	1.8	718	0.9
Any Source Reduction Activity	**4,534**	**20.3**	**18,340**	**22.0**

Note: All source reduction activities on a form are counted in the corresponding category. Totals do not equal the sum of the above categories because facilities and forms may report more than one source reduction activity.
* Source Reduction Activity reporting is only done using the Form R; Form As do not contain source reduction activity information.

There were 18,340 forms with source reduction activity reported in 2001, representing 22 percent of all Form Rs in 2001. The most frequently reported source reduction activity was good operating practices (listed by 10 percent of the facilities). Process modifications came next, reported by 7 percent of facilities, followed by raw materials modifications (by 5 percent of facilities) and spill and leak prevention (by 4 percent of facilities).

TRI DATA FOR 2000-2001

The data used to compare 2000 to 2001 do not include lead and lead compounds since the thresholds for reporting on lead and lead compounds were lowered for 2001 to 100 pounds.

Total On-site and Off-site Releases, 2000-2001

All TRI Chemicals

From 2000 to 2001, total TRI releases on- and off-site fell by 1.05 billion pounds or 15.5 percent. On-site releases decreased by 1.08 billion pounds, while off-site releases (transfers off-site to disposal) increased by 32.7 million pounds. The number of facilities and forms reporting each decreased by 4 percent. (See Table ES-14.)

On-site land releases comprised the largest type of on-site release and had the largest absolute decrease of 739.1 million pounds or 19 percent from 2000 to 2001. Disposal in RCRA subtitle C landfills decreased by 83.6 million pounds or 41 percent, while other on-site land releases decreased by 655.5 million pounds or 18 percent.

On-site air emissions, the second largest type of on-site release, decreased by 237.1 million pounds or 12 percent from 2000 to 2001. Point source air emissions decreased by 221.5 million pounds or 13 percent and fugitive air emissions decreased by 15.6 million pounds or 6 percent. Other types of on-site releases include underground injection and surface water discharges. Underground injection decreased by 61.2 million pounds or 23 percent and surface water discharges decreased by 46.9 million pounds or 17.5 percent.

The increase in off-site releases (transfers off-site to disposal) was primarily due to the increase of 30.2 million pounds (an increase of 41 percent) of metals and metal category compounds sent for solidification/stabilization and the increase of 21.8 million pounds (7 percent) in transfers to landfills/surface impoundments. Transfers to land treatment also increased from 2000 to 2001, by 1.5 million pounds or 25.5 percent.

Other types of off-site releases (transfers off-site to disposal) decreased from 2000 to 2001. Off-site underground injection decreased by 4.2 million pounds or 20.5 percent and transfers to storage decreased by 3.5 million pounds or 38 percent.

PBT Chemicals

On- and off-site releases of PBT chemicals decreased from 11.6 million pounds to 11.4 million pounds from 2000 to 2001, a decrease of almost 2 percent. Off-site releases decreased by 44 percent (2.0 million pounds) while on-site releases increased by 25 percent (1.8 million pounds). (See Table ES-15.)

The decrease in off-site releases (transfers to disposal) of PBT chemicals was largely due to a decrease of transfers off-site to landfills/surface impoundments of 1.6 million pounds (41 percent), which included decreases of 1.4 million pounds of polycyclic aromatic compounds.

On the other hand, the increase in on-site releases of PBT chemicals was due to an increase in on-site land releases of 2.2 million pounds. Such releases of mercury and mercury compounds increased by 1.2 million pounds and by 1.1 million pounds for polychlorinated biphenyls. Other types of on-site releases showed decreases, including air emissions which decreased by 355,196 pounds or 20 percent.

Total releases of dioxin and dioxin-like compounds increased by 50 percent (by 49,714 grams) from 2000-2001. On-site releases increased by 30 percent (by 9,476 grams) and off-site releases increased by 67 percent (by 36,548 grams). The largest increases occurred in off-site transfers to landfills/surface

Table ES-14: TRI On-site and Off-site Releases, 2000-2001

	2000 Number	2001 Number	Change 2000-2001 Number	Change 2000-2001 Percent
Total Facilities	23,604	22,615	-989	-4.2
Total Forms	90,659	86,952	-3,707	-4.1
Form Rs	77,687	74,710	-2,977	-3.8
Form As	12,972	12,242	-730	-5.6
On-site Releases	**Pounds**	**Pounds**	**Pounds**	**Percent**
Total Air Emissions	1,914,847,514	1,677,739,937	-237,107,578	-12.4
Fugitive Air Emissions	255,719,707	240,095,759	-15,623,948	-6.1
Point Source Air Emissions	1,659,127,808	1,437,644,178	-221,483,630	-13.3
Surface Water Discharges	267,240,517	220,382,696	-46,857,821	-17.5
Underground Injection	270,436,755	209,191,464	-61,245,291	-22.6
Class I Wells	240,690,232	193,230,425	-47,459,807	-19.7
Class II-V Wells	29,746,523	15,961,039	-13,785,484	-46.3
On-site Land Releases	3,824,390,738	3,085,260,659	-739,130,080	-19.3
RCRA Subtitle C Landfills	203,224,254	119,609,932	-83,614,323	-41.1
Other On-site Land Releases	3,621,166,484	2,965,650,727	-655,515,757	-18.1
Total On-site Releases	**6,276,915,525**	**5,192,574,756**	**-1,084,340,769**	**-17.3**
Off-site Releases				
Storage Only*	9,378,356	5,833,022	-3,545,333	-37.8
Solidification/Stabilization**	73,727,018	103,888,528	30,161,510	40.9
Metal and Metal Category Compounds Only				
Wastewater Treatment (Excluding POTWs)***	6,918,180	3,680,619	-3,237,561	-46.8
Metal and Metal Category Compounds Only				
Transfers to POTWs****	3,070,710	2,162,223	-908,486	-29.6
Metal and Metal Category Compounds Only				
Underground Injection	20,278,551	16,125,909	-4,152,642	-20.5
Landfills/Surface Impoundments	311,592,047	333,380,566	21,788,519	7.0
Land Treatment	5,689,259	7,141,281	1,452,022	25.5
Other Land Disposal	21,982,754	21,869,451	-113,303	-0.5
Other Off-site Management	17,851,630	14,926,431	-2,925,199	-16.4
Transfers to Waste Broker for Disposal	13,285,156	10,072,787	-3,212,368	-24.2
Unknown*****	5,951,138	3,349,797	-2,601,340	-43.7
Total Off-site Releases	**489,724,797**	**522,430,614**	**32,705,817**	**6.7**
(Transfers Off-site to Disposal)				
Total On- and Off-site Releases	**6,766,640,322**	**5,715,005,370**	**-1,051,634,952**	**-15.5**

Note: Does not include lead and lead 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 category compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. **Off-site Releases** do not include transfers to disposal sent to other TRI facilities that reported the amount as an on-site release.

* 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.

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

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

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

***** 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).

Table ES-15: TRI On-site and Off-site Releases, PBT Chemicals, 2000-2001

	2000 Number	2001 Number	Change 2000-2001 Number	Change 2000-2001 Percent
Forms	7,092	7,233	141	2.0
On-site Releases	**Pounds**	**Pounds**	**Pounds**	**Percent**
Total Air Emissions	1,746,439.21	1,391,243.35	-355,195.86	-20.3
Surface Water Discharges	21,437.42	19,627.51	-1,809.91	-8.4
Underground Injection	11,778.46	10,250.16	-1,528.31	-13.0
Class I Wells	1,996.38	1,881.97	-114.41	-5.7
Class II-V Wells	9,782.09	8,368.19	-1,413.90	-14.5
On-site Land Releases	5,300,098.18	7,451,857.42	2,151,759.24	40.6
RCRA Subtitle C Landfills	1,709,080.04	2,456,790.69	747,710.65	43.7
Other On-site Land Releases	3,591,018.14	4,995,066.73	1,404,048.59	39.1
Total On-site Releases	**7,079,753.28**	**8,872,978.44**	**1,793,225.16**	**25.3**
Storage Only*	17,119.66	11,352.22	-5,767.44	-33.7
Solidification/Stabilization**	415,330.48	68,254.65	-347,075.83	-83.6
Metals and Metal Category Compounds Only				
Wastewater Treatment (Excluding POTWs)***	6,850.32	2,679.38	-4,170.94	-60.9
Metals and Metal Category Compounds Only				
Transfers to POTWs****	413.09	469.60	56.51	13.7
Metals and Metal Category Compounds Only				
Underground Injection	0.00	1,305.63	1,305.63	--
Landfills/Surface Impoundments	3,785,264.99	2,232,285.81	-1,552,979.18	-41.0
Land Treatment	881.67	903.36	21.69	2.5
Other Land Disposal	115,965.59	100,282.88	-15,682.70	-13.5
Other Off-site Management	9,368.47	10,099.63	731.16	7.8
Transfers to Waste Broker for Disposal	80,898.95	100,078.16	19,179.21	23.7
Unknown*****	115,370.88	23,957.58	-91,413.30	-79.2
Total Off-site Releases (Transfers Off-site to Disposal)	**4,547,464.09**	**2,551,668.90**	**-1,995,795.19**	**-43.9**
Total On- and Off-site Releases	**11,627,217.37**	**11,424,647.34**	**-202,570.03**	**-1.7**

Note: Does not include lead and lead 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 category compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. **Off-site Releases** do not include transfers to disposal sent to other TRI facilities that reported the amount as an on-site release.

* 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.

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

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

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

***** 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).

impoundments (an increase of 43,614 grams or 303 percent) and on-site land releases (an increase of 14,536 grams or 38 percent).

Waste Management, 2000-2001

Quantities of TRI Chemicals in Waste, 2000-2001

There was a decrease from 32.57 billion pounds in 2000 to 25.50 billion pounds in 2001 of toxic chemicals managed in waste. This represented a decrease of 22 percent or 7.07 billion pounds. (See Table ES-16.)

On-site recycling, the largest type of waste management in 2001, decreased by 8 percent or 577.5 million pounds. On-site treatment, the second largest type of waste management, decreased by 5.27 billion pounds or 43 percent, from 12.20 billion pounds to 6.93 billion pounds.

The quantity released on- and off-site decreased by 882.4 million pounds (13 percent) from 6.63 billion pounds to 5.75 billion pounds. On-site energy recovery decreased from 2.78 billion pounds to 2.65 billion pounds, a 5 percent decrease. Off-site recycling also decreased, from 1.93 billion pounds to 1.71 billion pounds, an 11 percent decrease.

Table ES-16: Quantities of TRI Chemicals in Waste by Waste Management Activity, 2000-2001

Waste Management Activity	2000 Pounds	2001 Pounds	Change 2000-2001 Pounds	Change 2000-2001 Percent
Recycled On-site	7,592,124,633	7,014,669,655	-577,454,977	-7.6
Recycled Off-site	1,930,623,241	1,711,348,174	-219,275,067	-11.4
Energy Recovery On-site	2,780,607,819	2,646,863,860	-133,743,959	-4.8
Energy Recovery Off-site	824,053,536	826,301,360	2,247,823	0.3
Treated On-site	12,200,015,658	6,930,130,624	-5,269,885,034	-43.2
Treated Off-site	612,432,167	625,322,518	12,890,350	2.1
Quantity Released On- and Off-site	6,629,802,444	5,747,374,655	-882,427,788	-13.3
Total Production-related Waste Managed	**32,569,659,498**	**25,502,010,846**	**-7,067,648,652**	**-21.7**
Non-production-related Waste Managed	246,448,247	38,555,417	-207,892,830	-84.4

Note: Does not include lead and lead compounds. Data are from Section 8 of Form R of year indicated.

Both off-site treatment and off-site energy recovery increased from 2000 to 2001. Off-site treatment increased by 12.9 million pounds or by 2 percent and off-site energy recovery increased by 2.2 million pounds or less than one percent.

The quantity of toxic chemicals in non-production-related waste, waste due to remedial clean-up efforts or due to one-time catastrophic events, was lower in 2001 than in 2000. In 2000 it was 246.4 million pounds and in 2001 it was 38.6 million pounds.

Transfers Off-site for Further Waste Management, including Disposal, 2000-2001

Transfers of toxic chemicals off-site for further waste management, including disposal, decreased by 133.9 million pounds or 3 percent from 2000 to 2001. In 2000, total transfers were 3.89 billion pounds, and in 2001 they were 3.76 billion pounds. (See Table ES-17.)

The decrease in total transfers off-site for further waste management, including disposal, was primarily due to the decrease in transfers to recycling. Transfers to recycling decreased by 181.6 million pounds or 10 percent from 2000 to 2001. Transfers to POTWs was the second largest decrease of almost one million pounds or less than one percent.

Other types of transfers increased from 2000 to 2001. Transfers to energy recovery represented the largest increase, of 30.1 million pounds or 4 percent. Other off-site transfers to disposal increased by 17.5 million pounds or 3 percent.

TRI DATA FOR 1998-2001

The data used to compare 1998-2001 do not include the PBT chemicals or vanadium or vanadium compounds since some PBT chemicals and vanadium compounds were added to the TRI list of chemicals in 2000 and the reporting definition for vanadium changed. Also, the reporting thresholds for all PBT chemicals changed.

Table ES-17: TRI Transfers Off-site for Further Waste Management, including Disposal, 2000-2001

Type of Transfer	2000 Pounds	2001 Pounds	Change 2000-2001 Pounds	Change 2000-2001 Percent
Transfers to Recycling	1,876,943,476	1,695,305,732	-181,637,743	-9.7
Transfers to Energy Recovery	810,195,066	840,324,922	30,129,856	3.7
Transfers to Treatment	279,302,615	279,663,074	360,459	0.1
Transfers to POTWs	340,854,590	339,864,825	-989,764	-0.3
Metals and metal category compounds Only	3,070,710	2,162,223	-908,486	-29.6
Non-metal TRI Chemicals	337,783,880	337,702,602	-81,278	0.0
Other Off-site Transfers*	1,090,623	1,766,612	675,988	62.0
Other Off-site Transfers to Disposal**	582,217,909	599,730,184	17,512,275	3.0
Total Transfers for Further Waste Management, including Disposal	**3,890,604,279**	**3,756,655,350**	**-133,948,929**	**-3.4**

Note: Does not include lead and lead compounds. **Transfers Off-site for Further Waste Management, including Disposal** are from Section 6 of Form R.
* Other Off-site Transfers are transfers reported without a valid waste management code.
** Does not include transfers to POTWs of metals and metal category compounds.

Total On-site and Off-site Releases, 1998-2001

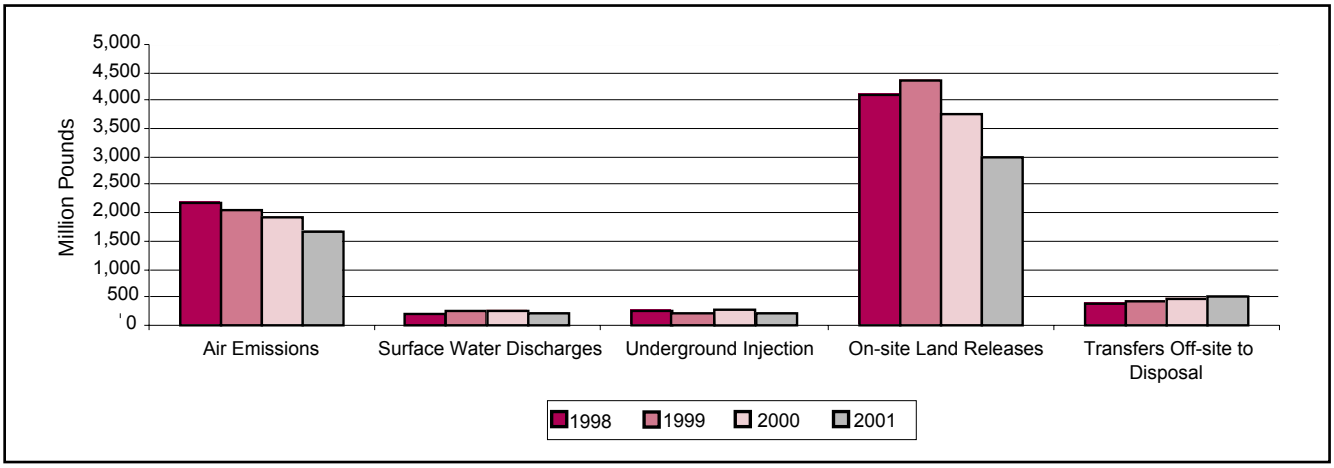
Total on- and off-site releases of TRI chemicals decreased by 22 percent from 1998 to 2001, a net decrease of 1.58 billion pounds. On-site releases decreased by 25 percent, but off-site releases (transfers off-site to disposal) increased by 26 percent. The number of facilities and forms reporting each decreased by 7 percent. (See Table ES-18.)

All types of on-site releases decreased for the four-year period 1998-2001. On-site land releases decreased by 1.11 billion pounds or 27 percent, with releases to RCRA subtitle C landfills decreasing by 73.9 million pounds or 39 percent and other on-site land releases by 1.03 billion pounds or 26 percent. On-site land releases had increased from 1998 to 1999 but then showed decreases from 1999 to 2001. (See Table ES-18 and Figure ES-2.)

Air emissions decreased steadily throughout the period with an overall decrease of 23 percent (499.8 million pounds), with point source air emissions decreasing by 19.5 percent (346.8 million pounds) and fugitive air emissions decreasing by 39 percent (152.9 million pounds). Underground injection also decreased, by 19 percent (50.1 million pounds). However, underground injection increased from 1999 to 2000 with decreases in the other years. Surface water discharges decreased by 13.5 percent (34.2 million pounds) overall from 1998 to 2001 with an increase from 1998 to 1999 and decreases after that. (See Table ES-18 and Figure ES-2.)

On the other hand, total off-site releases (transfers off-site to disposal) increased in all years from 1998 to 2001. The net increase in off-site releases was 106.8 million pounds or 26 percent. Transfers of metals and metal category compounds to solidification/stabilization represented the largest increase, of 61.9 million pounds or 149 percent. Transfers to landfills/surface impoundments represented the second largest increase of 51.2 million pounds (19 percent), followed by an increase in transfers off-site to underground injection of 7.8 million pounds (almost 94 percent). Other increases in off-site transfers included transfers to land treatment, which increased by 4.9 million pounds, and transfers of metals and metal category compounds to wastewater treatment facilities that are not POTWs, which increased by almost one million pounds. (See Table ES-18 and Figure ES-2.)

Figure ES-2: Distribution of TRI On-site and Off-site Releases, 1998-2001



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. **Off-site Releases** do not include transfers to disposal sent to other TRI facilities that reported the amount as an on-site release.

Table ES-18: TRI On-site and Off-site Releases, 1998 and 2000-2001

	1998	2000	2001	Change 1998-2001	
	Number	Number	Number	Number	Percent
Total Facilities	23,486	22,861	21,863	-1,623	-6.9
Total Forms	85,067	83,036	79,175	-5,892	-6.9
Form Rs	72,125	70,079	66,943	-5,182	-7.2
Form As	12,942	12,957	12,232	-710	-5.5
On-site Releases	**Pounds**	**Pounds**	**Pounds**	**Pounds**	**Percent**
Total Air Emissions	2,174,480,631	1,910,893,962	1,674,701,620	-499,779,010	-23.0
Fugitive Air Emissions	392,823,028	255,413,174	239,886,238	-152,936,791	-38.9
Point Source Air Emissions	1,781,657,602	1,655,480,788	1,434,815,383	-346,842,219	-19.5
Surface Water Discharges	253,953,970	266,570,826	219,722,131	-34,231,839	-13.5
Underground Injection	258,424,539	269,223,873	208,280,132	-50,144,407	-19.4
Class I Wells	232,355,325	239,487,132	192,332,268	-40,023,057	-17.2
Class II-V Wells	26,069,214	29,736,741	15,947,864	-10,121,350	-38.8
On-site Land Releases	4,104,341,065	3,740,842,968	2,997,152,316	-1,107,188,749	-27.0
RCRA Subtitle C Landfills	190,559,741	200,823,801	116,655,843	-73,903,898	-38.8
Other On-site Land Releases	3,913,781,324	3,540,019,167	2,880,496,473	-1,033,284,851	-26.4
Total On-site Releases	**6,791,200,204**	**6,187,531,629**	**5,099,856,200**	**-1,691,344,004**	**-24.9**
Off-site Releases					
Storage Only*	8,068,030	9,125,572	5,452,214	-2,615,816	-32.4
Solidification/Stabilization**	41,657,314	73,011,024	103,588,597	61,931,283	148.7
Metal and Metal Category Compounds Only					
Wastewater Treatment (Excluding POTWs)***	2,766,507	6,892,748	3,671,352	904,845	32.7
Metal and Metal Category Compounds Only					
Transfers to POTWs****	3,551,549	3,059,940	2,151,530	-1,400,019	-39.4
Metal and Metal Category Compounds Only					
Underground Injection	8,322,674	20,268,451	16,122,953	7,800,279	93.7
Landfills/Surface Impoundments	273,598,001	302,912,219	324,796,579	51,198,578	18.7
Land Treatment	2,214,102	5,613,484	7,071,250	4,857,148	219.4
Other Land Disposal	27,181,739	21,097,551	20,904,535	-6,277,204	-23.1
Other Off-site Management	18,232,677	16,791,321	13,947,438	-4,285,239	-23.5
Transfers to Waste Broker for Disposal	14,583,206	13,109,476	9,916,611	-4,666,595	-32.0
Unknown*****	3,887,947	5,817,637	3,276,626	-611,321	-15.7
Total Off-site Releases	**404,063,746**	**477,699,423**	**510,899,685**	**106,835,939**	**26.4**
(Transfers Off-site to Disposal)					
Total On- and Off-site Releases	**7,195,263,950**	**6,665,231,053**	**5,610,755,885**	**-1,584,508,065**	**-22.0**

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 category compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. **Off-site Releases** do not include transfers to disposal sent to other TRI facilities that reported the amount as an on-site release.

* 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.

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

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

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

***** 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).

Table ES-19: Quantities of TRI Chemicals in Waste by Waste Management Activity, 1998 and 2000-2001

Waste Management Activity	1998 Pounds	2000 Pounds	2001 Pounds	Change 1998-2001 Pounds	Change 1998-2001 Percent
Recycled On-site	7,391,905,255	7,587,287,732	7,010,766,721	-381,138,534	-5.2
Recycled Off-site	1,824,940,788	1,926,208,989	1,706,835,713	-118,105,074	-6.5
Energy Recovery On-site	2,709,965,393	2,770,146,731	2,636,089,326	-73,876,067	-2.7
Energy Recovery Off-site	903,081,432	823,770,927	826,113,285	-76,968,147	-8.5
Treated On-site	6,830,186,859	12,168,278,192	6,911,310,246	81,123,387	1.2
Treated Off-site	683,243,121	611,514,812	624,586,097	-58,657,023	-8.6
Quantity Released On- and Off-site	7,198,915,379	6,532,149,713	5,642,839,652	-1,556,075,727	-21.6
Total Production-related Waste Managed	**27,542,238,226**	**32,419,357,097**	**25,358,541,041**	**-2,183,697,185**	**-7.9**
Non-production-related Waste Managed	25,896,951	242,997,578	37,461,891	11,564,940	44.7

Note: Does not include PBT chemicals, vanadium and vanadium compounds. Data are from Section 8 of Form R of year indicated.

Some types of off-site releases (transfers off-site to disposal) decreased from 1998 to 2001. Transfers to other land disposal decreased by 6.3 million pounds (23 percent) and transfers to waste broker for disposal decreased by 4.7 million pounds (32 percent).

Waste Management Data, 1998-2001

Quantities of TRI Chemicals in Waste, 1998-2001

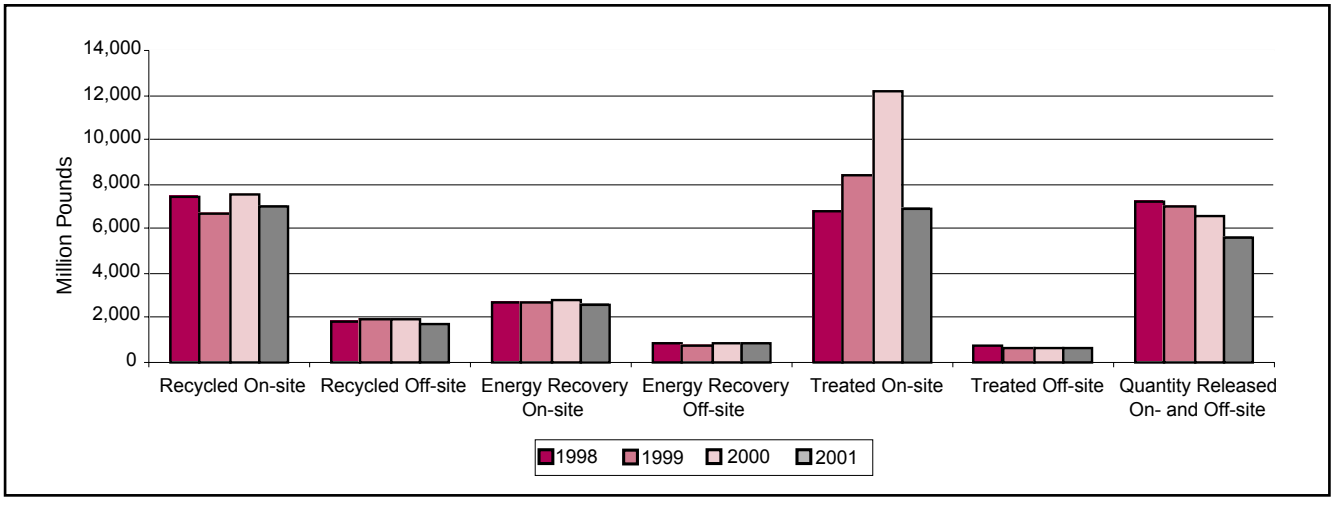
Overall, the quantities of TRI chemicals in waste by all TRI industries decreased by 8 percent from 1998 to 2001, a net decrease of 2.18 billion pounds. The quantity of toxic chemicals in production-related waste managed decreased from 27.54 billion pounds in 1998 to 25.36 billion pounds in 2001.

However, the total quantity of toxic chemicals in production-related waste had increased from 1998 to 2000, by 4.88 billion pounds, followed by a decrease of 7.06 billion pounds from 2000 to 2001. (See Table ES-19 and Figure ES-3.)

Much of the decrease from 1998 to 2001 came in the quantities released on- and off-site, which decreased by 1.56 billion pounds or 22 percent. Releases on- and off-site decreased steadily each year from 1998 to 2001.

The quantities of toxic chemicals recycled, combusted for energy recovery, and treated off-site also decreased. The decrease in on-site recycling was 381.1 million pounds or 5 percent. However, on-site recycling showed decreases and increases in alternating years throughout the 1998 to 2001

Figure ES-3: Distribution of TRI Chemicals in Waste by Waste Management Activity, 1998-2001



Note: Does not include PBT chemicals, vanadium and vanadium compounds. Data are from Section 8 of Form R of year indicated.

Table ES-20: TRI Transfers Off-site for Further Waste Management, including Disposal, 1998 and 2000-2001

Type of Transfer	1998 Pounds	2000 Pounds	2001 Pounds	Change 1998-2001 Pounds	Change 1998-2001 Percent
Transfers to Recycling	1,764,052,216	1,872,210,590	1,690,003,762	-74,048,454	-4.2
Transfers to Energy Recovery	910,148,236	809,911,478	840,129,629	-70,018,607	-7.7
Transfers to Treatment	327,002,600	278,473,901	279,017,884	-47,984,716	-14.7
Transfers to POTWs	333,858,199	340,838,435	339,847,710	5,989,511	1.8
Metals and Metal Category Compounds Only	3,551,549	3,059,940	2,151,530	-1,400,019	-39.4
Non-metal TRI Chemicals	330,306,649	337,778,495	337,696,180	7,389,531	2.2
Other Off-site Transfers*	678,007	1,090,611	1,765,114	1,087,106	160.3
Other Off-site Transfers to Disposal**	509,721,375	569,586,827	587,622,422	77,901,047	15.3
Total Transfers for Further Waste Management, including Disposal	**3,845,460,633**	**3,872,111,841**	**3,738,386,521**	**-107,074,112**	**-2.8**

Note: Does not include PBT chemicals, vanadium and vanadium compounds. **Transfers Off-site for Further Waste Management, including Disposal** are from Section 6 of Form R.
* Other Off-site Transfers are transfers reported without a valid waste management code.
** Does not include transfers to POTWs of metals and metal category compounds.

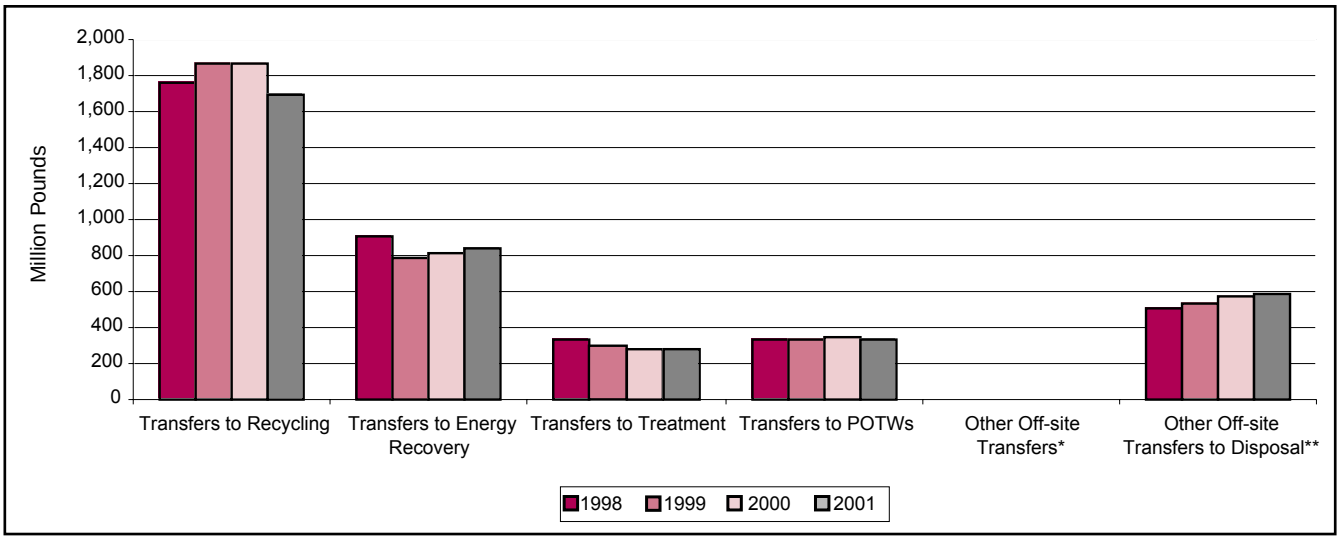
period. Off-site recycling decreased by 118.1 million pounds (6.5 percent) from 1998 to 2001, with increases from 1998 to 2000 and decreases only from 2000 to 2001. Energy recovery on- and off-site both decreased by over 70 million pounds. Off-site treatment decreased by 58.7 million pounds. (See Table ES-19 and Figure ES-3.)

Only on-site treatment increased from 1998 to 2001. On-site treatment increased by 81.1 million pounds, by just over one percent, overall from 1998 to 2001, but showed decreases in the most recent period 2000 to 2001. (See Table ES-19 and Figure ES-3.)

Transfers Off-site for Further Waste Management, including Disposal, 1998-2001

From 1998 to 2001, total transfers off-site for further waste management, including disposal, decreased by 3 percent or 107.1 million pounds. Such transfers decreased from 3.85 billion pounds in 1998 to 3.74 billion pounds in 2001. However, transfers off-site for further waste management, including disposal, had increased from 1998 to 2000, by 26.7 million pounds, followed by a

Figure ES-4: Distribution of TRI Transfers Off-site for Further Waste Management, including Disposal, 1998-2001



Note: Does not include PBT chemicals, vanadium and vanadium compounds. **Transfers Off-site for Further Waste Management, including Disposal** are from Section 6 of Form R.
* Other Off-site Transfers are transfers reported without a valid waste management code.
** Does not include transfers to POTWs of metals and metal category compounds.

decrease from 2000 to 2001 of 13.4 million pounds. (See Table ES-20 and Figure ES-4.)

Both transfers to recycling and transfers to energy recovery decreased by over 70 million pounds from 1998 to 2001. Transfers to recycling decreased by 74.0 million pounds or 4 percent, from 1998 to 2001, but had increased from 1998 to 1999. Transfers to energy recovery decreased by 70.0 million pounds or 8 percent from 1998 to 2001, but showed increases from 1999 to 2001. Transfers to treatment also decreased, by 48.0 million pounds or 15 percent, but showed increases in the most recent period from 2000 to 2001. (See Table ES-20 and Figure ES-4.)

Transfers to POTWs of metals and metal category compounds decreased by 1.4 million pounds or 39 percent. However, transfers to POTWs of non-metal TRI chemicals increased by 7.4 million pounds or 2 percent. Other types of transfers also increased from 1998 to 2001. Other off-site transfers to disposal increased by 77.9 million pounds or 15 percent, showing increases in each year from 1998 to 2001. (See Table ES-20 and Figure ES-4.)

TRI DATA FOR 1988-2001

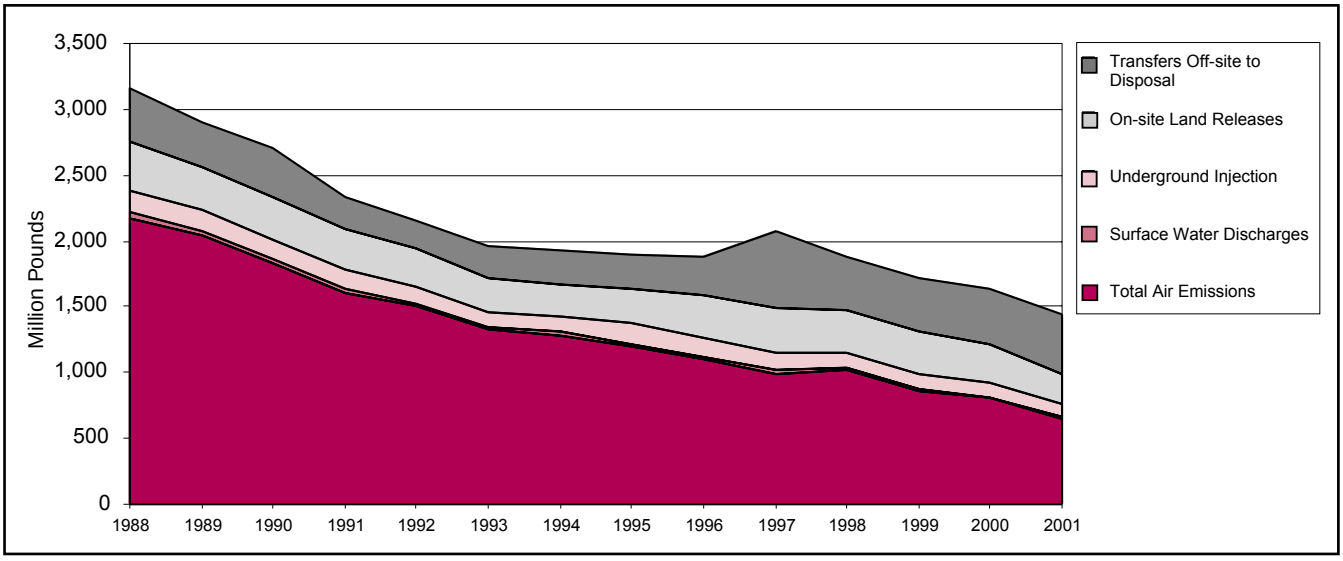
Year-to-year comparisons of TRI data from 1988 to 2001 are based on a consistent set of chemicals and reporting industries. They do not include chemicals added or deleted since 1988; they do not include chemicals such as the PBT chemicals whose reporting threshold has changed; and they also do not include the industries that were added to TRI reporting in 1998.

Total On-site and Off-site Releases, 1988-2001

For the core set of chemicals from industries that have reported consistently since 1988, total on- and off-site releases decreased by 54.5 percent between 1988 and 2001, a reduction of 1.72 billion pounds. At the same time, the number of forms submitted also declined, by 9 percent. On-site releases decreased by almost 64 percent or 1.76 billion pounds. However, off-site releases increased over this period by 12 percent or 46.7 million pounds. (See Table ES-21 and Figure ES-5.)

All on-site release categories showed overall decreases from 1998 to 2001. Air emissions have

Figure ES-5. Distribution of TRI On-site and Off-site Releases, 1988-2001



Note: Does not include delisted chemicals, chemicals added in 1990, 1994 and 1995, aluminum oxide, ammonia, hydrochloric acid, PBT chemicals, sulfuric acid, 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.

Table ES-21: Comparison of TRI On-site and Off-site Releases, 1988, 1998, and 2000-2001

	1988	1998	2000	2001	Change 1988-2001	
	Number	Number	Number	Number	Number	Percent
Total Forms	58,493	57,825	56,385	53,027	-5,466	-9.3
Form Rs	58,493	49,648	48,047	45,245	-13,248	-22.6
Form As	--	8,177	8,338	7,782	--	--
On-site Releases	**Pounds**	**Pounds**	**Pounds**	**Pounds**	**Pounds**	**Percent**
Total Air Emissions	2,177,827,051	1,017,486,824	802,497,247	649,457,993	-1,528,369,058	-70.2
Fugitive Air Emissions	679,531,956	307,023,499	183,630,556	156,891,800	-522,640,156	-76.9
Point Source Air Emissions	1,498,295,095	710,463,324	618,866,691	492,566,193	-1,005,728,902	-67.1
Surface Water Discharges	41,668,109	18,510,162	15,448,857	14,641,632	-27,026,477	-64.9
Underground Injection	161,907,957	114,414,728	111,099,346	94,949,272	-66,958,685	-41.4
On-site Land Releases	379,123,257	331,404,582	283,613,088	236,733,698	-142,389,559	-37.6
Total On-site Releases	**2,760,526,374**	**1,481,816,295**	**1,212,658,538**	**995,782,596**	**-1,764,743,778**	**-63.9**
Off-site Releases						
Storage Only*	13,668,594	5,147,870	7,777,575	4,858,034	-8,810,560	-64.5
Solidification/Stabilization**	26,620,239	122,645,462	132,543,685	156,874,378	130,254,139	489.3
Metals and Metal Category Compounds Only						
Wastewater Treatment (Excluding POTWs)***	4,521,656	2,754,133	6,666,418	6,776,955	2,255,299	49.9
Metals and Metal Category Compounds Only						
Transfers to POTWs****	9,373,166	3,260,012	3,021,489	2,094,688	-7,278,478	-77.7
Metals and Metal Category Compounds Only						
Underground Injection	8,510,253	10,184,718	19,290,244	14,968,456	6,458,203	75.9
Landfills/Surface Impoundments	243,616,951	209,442,977	224,551,703	232,942,848	-10,674,103	-4.4
Land Treatment	2,229,844	524,321	2,167,877	1,696,882	-532,962	-23.9
Other Land Disposal	9,200,093	13,089,809	7,688,229	4,486,807	-4,713,286	-51.2
Other Off-site Management	37,056,902	8,698,560	7,233,390	4,769,138	-32,287,765	-87.1
Transfers to Waste Broker for Disposal	28,335,683	12,060,273	11,453,376	8,388,361	-19,947,322	-70.4
Unknown*****	10,069,918	3,344,657	3,990,447	2,085,101	-7,984,817	-79.3
Total Off-site Releases	**393,203,299**	**391,152,792**	**426,384,432**	**439,941,648**	**46,738,349**	**11.9**
(Transfers Off-site to Disposal)						
Total On- and Off-site Releases	**3,153,729,673**	**1,872,969,088**	**1,639,042,971**	**1,435,724,244**	**-1,718,005,429**	**-54.5**

Note: Does not include delisted chemicals, chemicals added in 1990, 1994 and 1995, aluminum oxide, ammonia, hydrochloric acid, PBT chemicals, sulfuric acid, 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 category compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs. For the years 1998 and after, does not include industries, other than manufacturing industries, that are required to report for 1998 and later years only.

* 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.

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

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

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

***** 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).

decreased steadily over the years 1988 to 2001, with the exception of an increase from 1997 to 1998. Overall, on-site releases decreased 70 percent or 1.53 billion pounds. Surface water discharges decreased by 65 percent or 27.0 million pounds from 1988 to 2001, however, that time period also saw increases as well as decreases. Surface water discharges have decreased since 1998. (See Table ES-21 and Figure ES-5.)

On-site underground injection also had an overall decrease of 41 percent or 67.0 million pounds from 1988 to 2001, with several periods of increases within that time period. In the most recent years, underground injection increased from 1999 to 2000 with a decrease reported from 2000 to 2001. On-site land releases fell almost 38 percent or 142.4 million pounds. Increases in on-site land releases were reported from 1994 to 1997, but decreases have occurred each year from 1997 to 2001. (See Table ES-21 and Figure ES-5.)

Off-site releases, with an overall increase of 12 percent from 1988 to 2001, have shown increases

since 1992 with the exception of the period 1997 to 1998. The largest increases in off-site releases (transfers off-site to disposal) occurred in solidification/stabilization of metals and metal category compounds, an increase of 130.3 million pounds or over 489 percent, and in off-site underground injection, an increase of 6.5 million pounds or 76 percent. Transfers of metals and metal category compounds to wastewater treatment facilities that were not POTWs increased by 2.3 million pounds or 50 percent. (See Table ES-21 and Figure ES-5.)

Other types of off-site releases (transfers to disposal) decreased. The amount of chemicals in waste sent to other off-site management decreased, by 32.3 million pounds or 87 percent. Transfers to waste brokers for disposal decreased by 19.9 million pounds or 70 percent. Disposal in landfills/surface impoundments decreased by 10.7 million pounds or 4 percent.

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 reporting quantity thresholds) are not required to report. Thus, while the TRI includes 95,513 reports from 24,896 facilities for 2001, the 6.16 billion pounds of on- and off-site releases reported represent only a portion of all toxic chemical releases nationwide.

In addition, while many facilities base their TRI data on monitoring data, others report estimated data to TRI as the program does not mandate release monitoring. 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 methodologies.

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