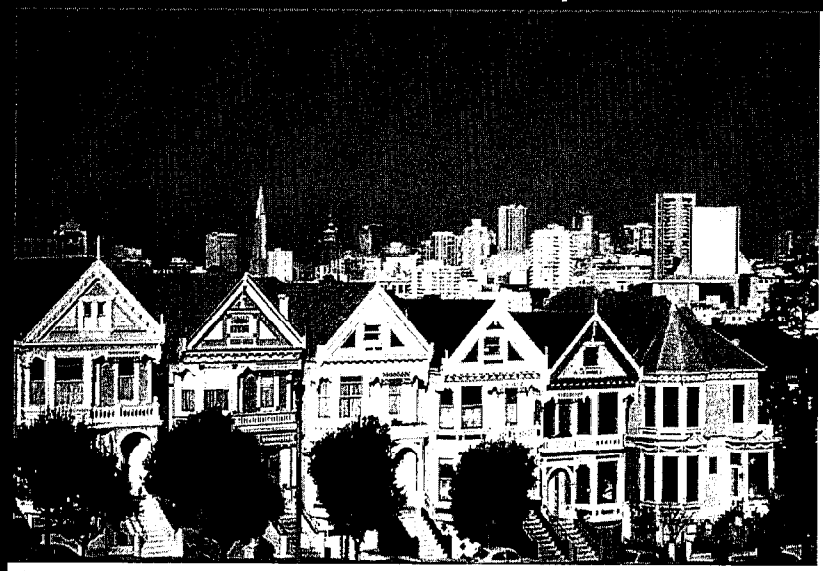
EPA-260-R-03-001

2001 Toxics Release Inventory (TRI)

Public Data Release Report



Public Access to the Toxics Release Inventory (TRI)

TRI Data Products

Data Product	Point of Access	Contact Information
2001 TRI Executive Summary (reference EPA 260-S-03-001) 2001 TRI Public Data Release Report (reference EPA 260-R-03-001)	U.S. Environmental Protection Agency ATTN: TRI Documents MC 2844T (EPA West, 5th Floor) 1200 Pennsylvania Ave., N.W. Washington, D.C. 20460	(202) 564-9554 E-mail: tridocs@epa.gov
2001 State Fact Sheets (reference EPA 260-F-03-002)	U.S. EPA Toxics Release Inventory (TRI) Website — 2001 Data Release	http://www.epa.gov/tri/tridata/tri01
2001 State Data Files in ASCII Delimited format	U.S. EPA Toxics Release Inventory (TRI) Website	http://www.epa.gov/tri/tridata/tri01
Chemicals in Your Community (reference EPA 550-K-99-001)	U.S. EPA's National Service Center for Environmental Publications (NSCEP)	(800) 490-9198 (513) 489-8190 FAX: (513) 489-8695 order online: http://www.epa.gov/ncepihom

TRI Online Access

Online Provider of TRI Data	Internet Access Address
TRI Explorer provides fast and easy access to the TRI data via U.S. EPA's latest TRI tool	http://www.epa.gov/triexplorer
U.S. EPA's TRI Program Homepage and 2001 data release page	http://www.epa.gov/tri http://www.epa.gov/tri/tridata/tri01
U.S. EPA's Envirofacts provides access to TRI data via U.S. EPA's Envirofacts Data Warehouse Query Engine	http://www.epa.gov/enviro/html/toxic_releases.html
Right-to-Know Network, operated by two nonprofit organizations (OMB Watch and the Center for Public Data Access), provides free access to TRI Data	http://www.rtknet.org
TOXNET® the National Library of Medicine's (NLM) Toxicology Data Network, provides free access to TRI data	http://toxnet.nlm.nih.gov/

EPA 260-R-03-001
July 2003

2001 Toxics Release Inventory Public Data Release Report

U.S. Environmental Protection Agency
Region 5, Library (PL-12J)
77 West Jackson Boulevard, 12th Floor
Chicago, IL 60604-3590

U.S. Environmental Protection Agency

Office of Environmental Information (2810A)

Washington, D.C. 20460

Also available from:

www.epa.gov/tri/tridata/tri01

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2001 Toxics Release Inventory
Executive Summary

2001 Toxics Release Inventory
Executive Summary

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.

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

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

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.

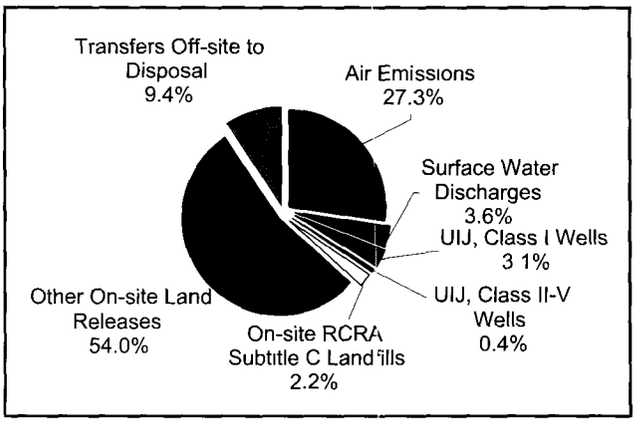
For the 2000 reporting year, certain PBT chemicals (see above) were added to the list of TRI chemicals. Also, in October 1999, EPA added vanadium compounds to the TRI list and changed the reporting qualifier for vanadium (already on the list of TRI chemicals) from "fume or dust" to "except when contained 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 (Transfers Off-site to Disposal)	**577,723,085**	**9.4**
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

				On-site Releases					Off-site Releases		
				Underground Injection		On-site Land Releases					
State	Total Facilities	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

				On-site Releases						Off-site	
					Underground Injection		On-site Land Releases			Releases	Total
SIC Code	Industry	Total Facilities	Total Forms	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	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	7,324,511	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

		On-site Releases							Off-site Releases	
				Underground Injection		On-site Land Releases				
CAS Number	Chemical	Total Air Emissions Pounds	Surface Water Discharges Pounds	Class I Wells Pounds	Class II-V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds	Total On-site Releases Pounds	Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
--	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

			On-site Releases							Off-site	
					Underground Injection		On-site Land Releases				
CAS Number	Chemical	Total Forms	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--
	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 On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On- and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-production-related Waste Managed 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 Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site 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	50,788,553	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 On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On- and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-production-related Waste Managed 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	Projected Change 2001-2002	Projected Change 2002-2003	Projected Change 2001-2003
	Percent	Percent	Percent	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** Metal and Metal Category Compounds Only	73,727,018	103,888,528	30,161,510	40.9
Wastewater Treatment (Excluding POTWs)*** Metal and Metal Category Compounds Only	6,918,180	3,680,619	-3,237,561	-46.8
Transfers to POTWs**** Metal and Metal Category Compounds Only	3,070,710	2,162,223	-908,486	-29 6
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 (Transfers Off-site to Disposal)	**489,724,797**	**522,430,614**	**32,705,817**	**6.7**
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 reatment 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

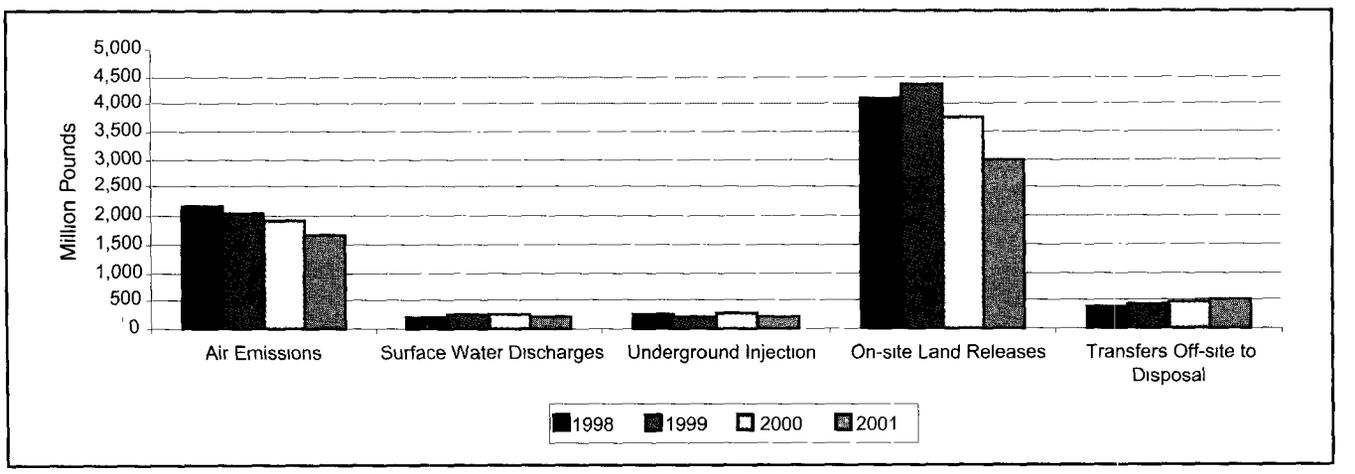
Total on- and off-site releases of TRI chemicals decreased by 22 percent from 1998 to 2001, a net decrease of 1.58 billion pounds. On-site releases decreased by 25 percent, but off-site releases (transfers off-site to disposal) increased by 26 percent. The number of facilities and forms reporting each 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** Metal and Metal Category Compounds Only	41,657,314	73,011,024	103,588,597	61,931,283	148.7
Wastewater Treatment (Excluding POTWs)*** Metal and Metal Category Compounds Only	2,766,507	6,892,748	3,671,352	904,845	32.7
Transfers to POTWs**** Metal and Metal Category Compounds Only	3,551,549	3,059,940	2,151,530	-1,400,019	-39.4
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 (Transfers Off-site to Disposal)	**404,063,746**	**477,699,423**	**510,899,685**	**106,835,939**	**26.4**
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

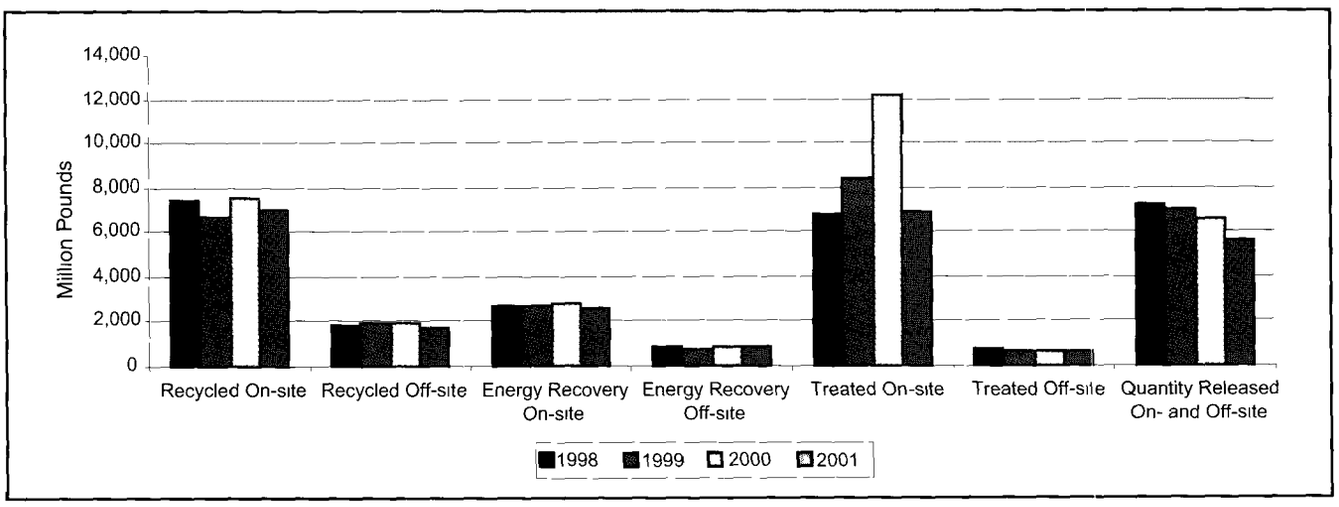
Quantities of TRI Chemicals in Waste, 1998-2001

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*

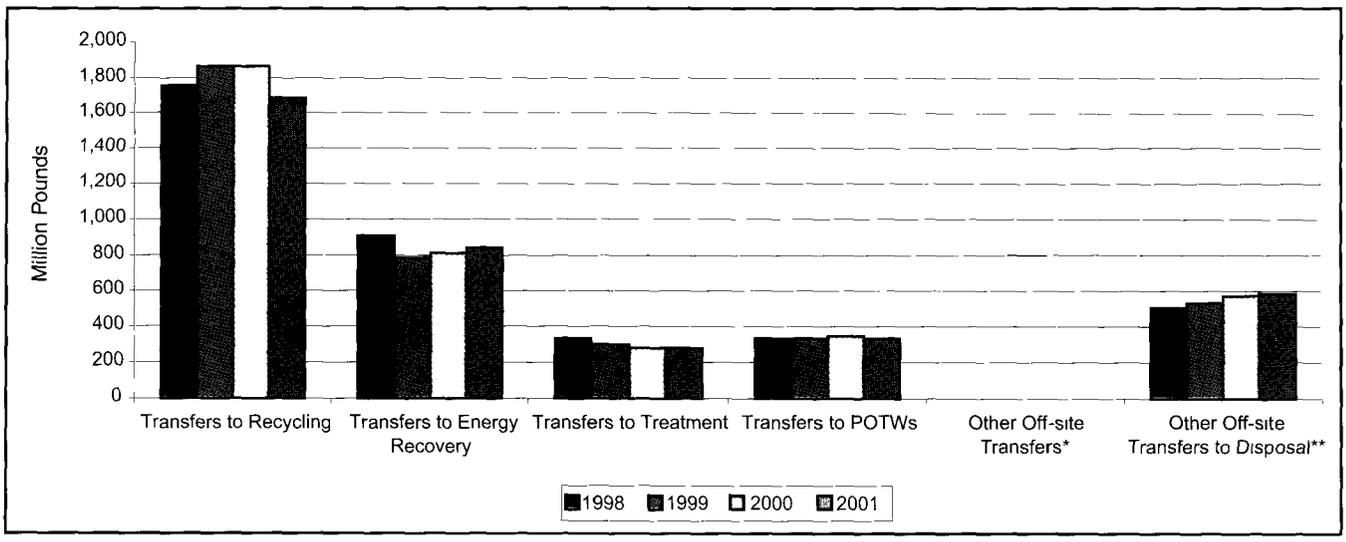
period. Off-site recycling decreased by 118.1 million pounds (6.5 percent) from 1998 to 2001, with increases from 1998 to 2000 and decreases only from 2000 to 2001. Energy recovery on- and off-site both decreased by over 70 million pounds. Off-site treatment decreased by 58.7 million pounds. (See Table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

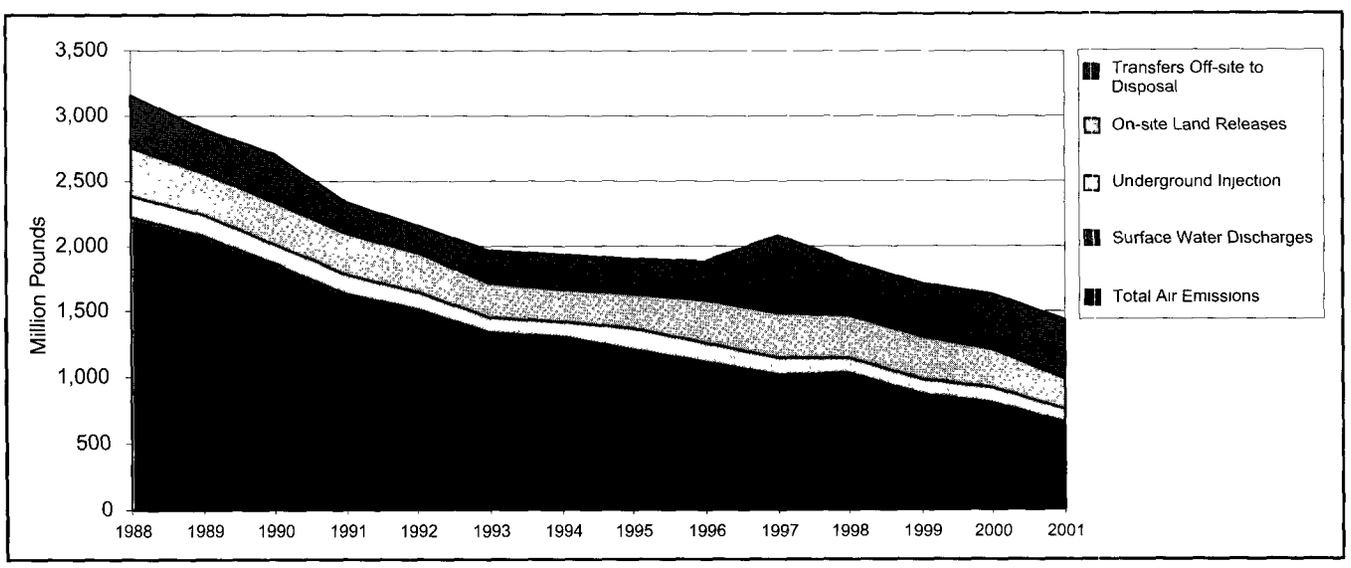
Year-to-year comparisons of TRI data from 1988 to 2001 are based on a consistent set of chemicals and reporting industries. They do not include chemicals added or deleted since 1988; they do not include chemicals such as the PBT chemicals whose reporting threshold has changed; and they also do not include 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 (Transfers Off-site to Disposal)	**393,203,299**	**391,152,792**	**426,384,432**	**439,941,648**	**46,738,349**	**11.9**
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.

Chapter 1

Toxics Release Inventory Reporting and the 2001 Public Data Release

Chapter 1
Toxics Release Inventory Reporting and the 2001 Public Data Release

INTRODUCTION

Following a fatal chemical-release accident in Bhopal, India, the Emergency Planning and Community Right-to-Know Act (EPCRA) provisions were enacted to promote emergency planning, to minimize the effects of an accident such as occurred at Bhopal, and to provide the public with information on releases of toxic chemicals in their communities.

Section 313 of EPCRA established the Toxics Release Inventory (TRI) Program, a national database that identifies facilities, chemicals manufactured, processed and used at the identified facilities, and the annual amounts of these chemicals released (in routine operations including spills and in catastrophic accidents and other one-time events) and otherwise managed on- and off-site in waste.

In 1990, Congress passed the Pollution Prevention Act (PPA). Among its requirements was a mandate to expand TRI to include additional information on toxic chemicals in waste and on source reduction methods. Beginning in 1991, covered facilities were required to report quantities of TRI chemicals treated on-site, recycled, and combusted for energy recovery. This waste management data has strengthened TRI as a tool for providing information on facilities' handling of TRI chemicals in waste as well as for analyzing progress in reducing releases.

The TRI Program has been a tremendously successful program. The industries that have reported to TRI since its inception have reduced their on- and off-site releases of TRI chemicals by 54.5 percent or 1.72 billion pounds (for chemicals reportable in all years). Governments—federal, state, and local—have used TRI to set priorities, measure progress, and target areas of special and immediate concern. The public has used the TRI data to understand their local environment, to participate in local and national debates about the choices being made that may affect their health and the health of their children and, ultimately, to exert their influence on the outcome of these debates. The release estimates are an input to determine exposure or calculate potential risks to human health and the environment, but by themselves do not represent risk. Given the potential for using TRI data in these ways, it is important for the public to understand the limitations as well as the benefits of TRI data and factors that should be considered in drawing conclusions from the data about risks to human health or the environment. The determination of potential risk depends on many factors, including toxicity, chemical fate after release, release location, and population concentrations.

Since TRI began in 1987, the program has grown. For the reporting year 2000, TRI was expanded to include certain new persistent bioaccumulative toxic (PBT) chemicals. In addition, reporting thresholds were lowered for both the newly-added PBT chemicals and certain PBT chemicals already on the TRI list (see **Chapter 3** for the PBT Chemicals TRI data). The year 1998 marked the first reporting by seven additional industry sectors: metal mining, coal mining, electrical utilities that combust coal and/or oil, hazardous waste treatment and disposal facilities, chemical wholesale distributors, petroleum bulk stations and terminals, and solvent recovery services (see **Who Must Report?** in this chapter for specific industry identification). Since 1994, federal facilities have been added to TRI and the number of reportable chemicals has nearly doubled.

Now in the second decade of the TRI Program, many challenges in the Right-to-Know Program remain to be met. TRI was designed to be a program that would evolve, over time, to meet the changing needs of an informed and involved public. TRI is not a static program. As new chemicals of concern are identified, they will be added. Sectors that appear to contribute to environmental loadings will be added. Data collection will be modified to meet new information needs and access technologies will be developed over time to assure enhanced public access to the TRI data.

2001 PUBLIC DATA RELEASE

This *2001 Toxics Release Inventory Public Data Release Report* (EPA 260-R-03-001) provides a detailed view of the information collected through TRI. This volume summarizes data collected for calendar year 2001, along with changes since 1988. The companion volume, *2001 TRI Public Data Release: State Fact Sheets* (EPA 260-F-03-002), supplies TRI data in greater detail for each state and territory. The on-line TRI Explorer, a Web tool for searching TRI data, available at http://www.epa.gov/triexplorer, includes data collected for all years, including those not found in this report. In addition, the TRI data can be accessed through EPA's Envirofacts data warehouse at http://www.epa.gov/enviro.

The *2001 Toxics Release Inventory Public Data Release Report* contains three chapters plus an executive summary. This chapter provides background information, and important factors and assumptions that need to be considered when using TRI data. Chapter 2 examines TRI data as reported by industry sectors. It gives an overview of on- and off-site releases, management of TRI chemicals in waste, and transfers off-site for further waste management for 2001, 2000 and 2001, and 1998 through 2001. Chapter 3 presents TRI data for 2000 and 2001 for PBT chemicals. Federal Facility data are also examined in Chapters 2 and 3.

Appendix A provides data for all reportable chemicals. Appendix B provides data for metals and metal category compounds. Appendix C provides information for those TRI chemicals that have been designated as OSHA carcinogens. Appendix D lists ways to access the TRI data and related information. Appendix E provides a list of TRI Program contacts in the EPA regional offices and state offices. Appendix F is the TRI reporting form: (Form R) and the Form A Certification Statement. Appendix G provides data on long-term trends by industry, including 1995 through 2001, 1991 through 2001, and 1988 through 2001.

TRI REPORTING

Each year, facilities that meet certain thresholds must report their releases and other waste management activities for listed toxic chemicals to EPA and to the state or tribal entity in whose jurisdiction the facility is located. The TRI list for 2001 included more than 600 chemicals and 30 chemical categories. Each facility submits a TRI reporting form for each TRI chemical it has manufactured, processed, or otherwise used during 2001 in amounts exceeding the thresholds (see **How Do Facilities Report?** later in this chapter).

Reports for each calendar year are due by July 1 of the following year. After completion of data entry and data quality assurance activities, the Agency makes the data available to the public in printed reports, in a computer database, and through a variety of other information products. States also make available to the public copies of the forms filed by facilities in their jurisdiction. In addition, some states independently produce a data release report.

Who Must Report?

Facilities with Standard Industrial Classification (SIC) primary codes 20 through 39 have been required to report to TRI since 1987 (see Box 1-1). Federal facilities have been required to report since 1994, regardless of their SIC code. In May 1997, EPA added seven new industry sectors who began reporting in 1998:

- Metal mining (SIC code 10, except 1011, 1081, and 1094),
- Coal mining (SIC code 12, except 1241),

- Electrical utilities that combust coal and/or oil for the purpose of generating power for distribution in commerce (SIC codes 4911, 4931, and 4939),
- RCRA Subtitle C hazardous waste treatment and disposal facilities (in SIC code 4953),
- Chemical wholesalers (SIC code 5169),
- Petroleum terminals and bulk stations (SIC code 5171), and
- Solvent recovery services (in SIC code 7389).

Facilities in the specified industries that have the equivalent of 10 or more full-time employees and meet the established thresholds for manufacturing, processing, or "otherwise use" of listed chemicals must report their releases and other waste management quantities (including quantities transferred off-site for further waste management).

For most chemicals, thresholds for manufacturing and processing are currently 25,000 pounds for each listed chemical, while the threshold for otherwise using is 10,000 pounds per chemical. For the group of PBT chemicals these thresholds have been lowered.

Box 1-1 summarizes the requirements that determine whether facilities must report.

What Must Be Reported?

Each year, facilities report to TRI the amounts of toxic chemicals released on-site to air, water, and land and injected underground (Section 5 of TRI Reporting Form R), and the amounts of chemicals transferred off-site for recycling, energy recovery, treatment, and disposal (Section 6 of Form R). They also report production-related waste management information on quantities recycled, combusted for energy recovery, treated, or released or otherwise disposed of, both on- and off-site, and catastrophic or other one-time releases (Section 8 of Form R).

Box 1-1: Who Must Report to TRI?

A facility must report to TRI if it:

- Conducts manufacturing operations within Standard Industrial Classification (SIC) codes 20 through 39 or, beginning in the 1998 reporting year, if it is in one of the following industries: metal mining, coal mining, electrical utilities that combusted coal and/or oil, RCRA Subtitle C hazardous waste treatment and disposal facilities, chemical distributors, petroleum terminals and bulk storage facilities, and solvent recovery services. Also, federal facilities must report to TRI regardless of their SIC code classification.
- Employs 10 or more full-time-equivalent employees; and
- Manufactures or processes more than 25,000 pounds or otherwise uses more than 10,000 pounds of any listed chemical during the calendar year, except for PBT chemicals where the thresholds are 0.1 gram for dioxin and dioxin-like compounds, and 10 or 100 pounds for other PBT chemicals.

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

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

Tables in this report present data by industry sector (two-digit SIC code). Industrial facilities often conduct interrelated operations that result in products or services which are classified in different SIC codes. Box 2-3 explains the classification of facilities reporting multiple codes.

To some extent, data in Sections 5, 6, and 7 of Form R and those in Section 8 represent a different view of essentially the same information.

Facilities provide specific identifying information, such as:

- Name
- Location
- Type of business
- Contact names
- Name of parent company
- Environmental permit numbers

They also provide information about the manufacture, process, and otherwise use of the listed chemical at the facility and the maximum amount of the chemical on-site during the year. Facilities provide information about methods used to treat waste streams containing the toxic chemicals at the site and the efficiencies of those treatment methods. In addition to information about the amount of toxic chemicals sent off-site for waste management, facilities also must specify the destination of these transfers. Beginning with the 1991 reports, facilities were required to provide information about source reduction and other pollution prevention activities, along with the quantities managed in waste by activities such as recycling. Companies must provide a production index that can help relate changes in reported quantities of toxic chemicals in waste managed to changes in production.

These additional data elements facilitate tracking of industry progress in reducing waste generation and moving towards safer waste management alternatives. While current TRI data cannot provide an absolute measure of pollution prevention, the data can provide insights into the complete toxics cycle.

Box 1-2 summarizes what facilities must report to TRI. See **TRI Releases and Waste Management: Data Analyzed in the *2001 TRI Public Data Release Report*** later in this chapter for more detail on the data that facilities report, as those data are presented and analyzed throughout this book.

How Do Facilities Report?

TRI facilities may file their TRI reports either electronically, using the TRI reporting software, or in hard copy. Each facility submits a Form R for each TRI chemical for which it meets the reporting requirements. Starting with the 1995 reporting year, facilities with lower levels of reportable amounts that do not manufacture, process, or otherwise use more than 1 million pounds of the chemical can certify that they are not required to report on the Form A certification statement.

Box 1-2: What Must Be Reported to TRI?

Information reported by facilities includes:

- Basic information identifying the facility,
- Name and telephone number of a contact person,
- Environmental permits held,
- Amounts of each listed chemical released to the environment at the facility,
- Amounts of each chemical sent from the facility to other locations for recycling, energy recovery, treatment, or disposal,
- Amounts of each chemical recycled, burned for energy recovery, or treated at the facility,
- Maximum amount of chemical present on-site at the facility during year,
- Types of activities conducted at the facility involving the toxic chemical, and
- Source reduction activities.

Form R

The Form R is the TRI reporting form that must be submitted annually by the owner or operator of a covered facility. The reports are submitted on or before July 1 and cover activities that occurred at the facility during the previous calendar year. With the TRI reporting form, EPA provides instructions and technical guidance on how to calculate toxic chemical releases from facilities. The *Toxic Chemical Release Inventory Reporting Forms and Instructions* are available on the Internet at http://www.epa.gov/tri.

Form A

While expanding chemical and industry coverage, EPA has also provided a burden-reducing option for facilities with relatively low quantities of listed toxic chemicals in waste. Beginning in 1995, as the expanded chemical list went into effect, facilities whose total annual reportable amount of a listed toxic chemical does not exceed 500 pounds can apply a higher activity threshold in determining their reporting obligations. The total annual reportable amount is defined as the sum of the waste management categories that would be reported to TRI: quantities released (including disposal), recovered as a result of on-site recycling operations, combusted on-site for energy recovery, and treated at the facility, plus amounts transferred off-site for recycling, energy recovery, treatment, and disposal. These amounts correspond to total production-related waste.

If the facility does not exceed the total production-related amount of 500 pounds, it is eligible for a manufacture, process, or otherwise use threshold of 1 million pounds of the listed chemical. If it does not exceed either the reported amount or the alternate one million pound threshold, the facility does not have to file a Form R. Instead of filing a Form R detailing its releases and other waste management activities, the facility can submit a certification statement (Form A). Form A certifies that the facility met the conditions outlined above and is not required to report the TRI data for that chemical.

What Are the Benefits and Limitations of the Data?

Benefits

The TRI Program has given the public unprecedented direct access to toxic chemical release and other waste management data at the local, state, regional, and national level. Use of this information can enable the public to identify potential concerns, gain a better understanding of potential risks, and work with industry and government to reduce toxic chemical releases and the risks associated with them. When combined with hazard and exposure data, this information can allow informed environmental priority-setting at the local level.

Federal, state, and local governments can use the data to compare facilities or geographic areas, to identify hot spots, to evaluate existing environmental programs, to more effectively set regulatory priorities, and to track pollution control and waste reduction progress. TRI data, in conjunction with demographic data, can help government agencies and the public identify potential environmental justice concerns.

Industry can use the data to obtain an overview of the release and other waste management of toxic chemicals, to identify and reduce costs associated with toxic chemicals in waste, to identify promising areas of pollution prevention, to establish reduction targets, and to measure and document progress toward reduction goals. Public availability of the data has prompted many facilities to work with communities to develop effective strategies for reducing environmental and human health risks posed by releases and other waste management of toxic chemicals.

Completion of three major efforts in EPA's strategy to enhance TRI's effectiveness has significantly increased the usefulness of TRI data. These actions were the TRI chemical expansion for the 1995 reporting year, facility expansion to include new industries for the 1998 reporting year, and expanded coverage of PBT chemicals through lower reporting thresholds and addition of PBT chemicals to the

TRI chemical list beginning with the 2000 reporting year.

EPA's expansion strategy has given TRI users a substantially greater range and depth of valuable information. EPA's action on chemical expansion nearly doubled the number of chemicals that TRI addresses. As a result of the addition of seven industries, nearly 2,000 additional facilities have submitted reports. Beginning with the data for reporting year 2000, communities have available additional information on releases and other waste management of PBT chemicals that may pose potential threats to human health and the environment.

Limitations

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 human and other populations that are exposed to the chemical after its release.

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. **What to Consider When Using TRI Data**, later in this chapter, describes specific information to keep in mind when analyzing TRI data.

Even with the expanded industry coverage, TRI does not address all sources of releases and other waste management activities of TRI chemicals. Although the Agency has expanded the number of industries that must report and has added PBT chemicals to the section 313 list of toxic chemicals, the program does not cover all sources of TRI chemicals. Although TRI is successful in capturing information on a significant portion of toxic chemicals currently being used by covered industry sectors, it does not cover all toxic chemicals or all industry sectors. In addition, facilities that do not meet the TRI threshold levels (those with fewer than 10 full-time employees or those not meeting TRI quantity thresholds) are not required to report. The new PBT chemicals reporting thresholds expand the information TRI will collect, but only for a subset of the TRI chemicals. 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.

The TRI does not include data on toxic emissions from cars and trucks, nor from the majority of sources of releases of pesticides, volatile organic compounds, fertilizers or from many other non-industrial sources.

While many facilities base their TRI data on monitoring data, others report estimated data to TRI as the program does not mandate additional 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. These factors should be taken into account when considering data accuracy and comparability.

As discussed above, the TRI data summarized in this report reflect chemical releases and other waste management activities that occur in a given calendar year. Patterns of releases and other waste management activities can change dramatically from one year to the next. Thus, it is important to recognize that current facility activities may be different from those reported for 2001 or prior years.

TRI IN PERSPECTIVE

In 1987, when the Congress passed EPCRA, more than 300 chemicals and chemical categories were included in the "TRI Chemical List" and the manufacturing sector in SIC codes 20–39 was required to report under EPCRA section 313. Further, data coverage was initially confined to information on releases and certain transfers off-site for further waste management.

Passage of the Pollution Prevention Act in 1990 expanded TRI to include additional information on toxic chemicals in waste and also on source reduction methods. Beginning in 1991, covered facilities were required to report quantities of TRI chemicals recycled, combusted for energy recovery, and treated on- and off-site. Over time, EPA has worked to expand TRI to cover other industrial sectors and chemicals. Towards that end, the Agency has pursued an expansion strategy that has enlarged the boundaries of TRI in several directions.

Chemical Expansion

The original TRI chemical list combined two existing lists: the New Jersey Environmental Hazardous Substance List and the Maryland Chemical Inventory Report List. Over time, through EPA's petition process, the original list has been modified as the Agency responded to petitions to add and delete chemicals, given the law's toxicity listing criteria. These criteria focus on both acute and chronic health effects as well as environmental effects, as outlined in section 313(d) of EPCRA.

The first chemical expansion occurred in 1993 with the addition of certain chemicals that appear on the Resource Conservation and Recovery Act (RCRA) (58 FR 63500) list of hazardous wastes and certain hydrochlorofluorocarbons (HCFCs) (58 FR 63496) to EPCRA section 313.

The second expansion was the addition of 286 chemicals and chemical categories on November 30, 1994 (59 FR 61432).[1] The additional chemicals can be characterized as high or moderately high in toxicity, and they are currently manufactured, processed, or otherwise used in the U.S.. Many are high production volume (HPV) chemicals. This list expansion raised the number of chemicals and chemical categories reported to TRI to more than 600. Specifically, the rule added more than 150 pesticides, certain Clean Air Act chemicals, certain Clean Water Act Priority Pollutants, and certain Safe Drinking Water Act chemicals. Many of the chemicals are carcinogens, reproductive toxicants, or developmental toxicants. Of particular note is the addition of industrial chemicals such as diisocyanates, n-hexane, N-methyl-2-pyrrolidone, and chemicals such as polycyclic aromatic compounds that result from the combustion of fuels.

Facility Expansion

Since the enactment of EPCRA, the TRI Program has focused on the releases and other waste management activities of the manufacturing sector—facilities that classify themselves as being primarily in SIC codes 20–39. To provide the public with a more complete picture of the toxics in their community, EPA undertook a detailed examination of other, non-manufacturing industries to determine which may be significant generators of toxic chemical releases and other wastes. This effort focused particular attention on sectors linked to manufacturing—those providing energy, further managing products, or further managing waste from the manufacturing sector.

Factors used to evaluate industries for this expansion included other available data on toxic chemical releases and other waste management activities, the interrelationship of non-manufacturing operations to manufacturing operations, the degree to which reporting would be expected to occur, and the potential burden that TRI reporting might impose on these facilities.

On May 1, 1997, EPA published a final rule (62 FR 23833) adding seven industry sectors to TRI: metal mining, coal mining, electrical utilities that combust coal and/or oil, hazardous waste treatment and dis-

[1] Of the 286 chemicals, 20 were diisocyanates and 19 were polycyclic aromatic compounds These are reported not as individual chemicals, but as two chemical compound categories Not individually counting the members of these two categories converts 286 to 249 Furthermore, three other chemicals have been remanded and one chemical was not reportable because of an administrative stay Thus, the number of chemicals added to TRI, beginning with the 1995 reporting year, was 245

posal facilities, chemical wholesale distributors, petroleum bulk stations and terminals, and solvent recovery services (**Who Must Report?**, earlier in this chapter, identifies the SIC codes for the added industries). EPA has also conducted an aggressive outreach campaign, including guidance, training, and technical assistance to assist these new industries in understanding their reporting obligations. Final guidance documents for these industries are available from EPA's Web site at http://www.epa.gov/tri.

Persistent Bioaccumulative Toxic Chemicals (PBTs)

Beginning with the reporting year 2000, lower reporting thresholds apply to TRI facilities that manufacture, process, or otherwise use certain PBT chemicals. Also, additional PBT chemicals that TRI had not previously covered were added to the section 313 toxic chemical list. These new reporting requirements were issued in October 1999 (64 FR 58666) and on January 17, 2001 (66 FR 4500) for lead and lead compounds.[2]

PBT chemicals include substances such as mercury, lead, and polychlorinated biphenyls (PCBs), already on the TRI list, and dioxin and dioxin-like compounds, which were among the chemicals added for the 2000 reporting year. The PBT chemicals are of particular concern not only because they are toxic, but also because they remain in the environment for long periods of time and are not readily destroyed (i.e., they are persistent), and build up or accumulate in body tissue (i.e., they bioaccumulate). Relatively small releases of PBT chemicals can pose human and environmental health threats. Consequently, these chemicals warrant recognition by communities as potential health threats and information about their releases and other waste management activities need to be captured by the TRI.

In the October 1999 PBT chemical rulemaking, EPA created three separate thresholds for PBT chemicals: 10 pounds for certain highly persistent, highly bioaccumulative toxic chemicals, 100 pounds for other PBT chemicals, and a special threshold of 0.1 grams for dioxin and dioxin-like chemicals. The threshold for a PBT chemical is the same for manufacturing, processing or otherwise use (i.e., either 100 pounds or 10 pounds or 0.1 grams for dioxin and dioxin-like compounds). Under the existing thresholds of 25,000 pounds for manufacture or processing of a listed chemical and 10,000 pounds for otherwise using a listed chemical, important information on the releases and other waste management activities of the PBT chemicals were not reported. In addition to the chemical category of dioxin and dioxin-like compounds (a total of 17 substances), six other PBT chemicals have been added to TRI: benzo(g,h,i)perylene, benzo(j,k)fluorene (fluoranthene) (as part of the PACs category), 3-methylcholanthrene (as part of the PACs category), octachlorostyrene, pentachlorobenzene, and tetrabromobisphenol A. New reporting thresholds apply to the following PBT chemicals already on the TRI list: aldrin, chlordane, heptachlor, hexachlorobenzene, isodrin, methoxychlor, pendimethalin, polycyclic aromatic compounds, polychlorinated biphenyls, toxaphene, trifluralin, lead and lead compounds, mercury and mercury compounds.

TRI RELEASES AND WASTE MANAGEMENT: DATA ANALYZED IN THE *2001 TRI PUBLIC DATA RELEASE REPORT*

What to Consider When Using TRI Data

Users of TRI information should be aware that TRI data reflect releases and other waste management activities of chemicals, not whether (or to what degree) the public has been exposed to those chemicals. 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 which involve toxic chemicals. The determination of potential risk depends upon many factors, including the toxicity

[2] The lower reporting threshold and requirements for lead and lead compounds are effective for the 2001 reporting year and applies to all lead and lead compounds except for lead when contained in stainless steel, brass, or bronze alloys

of the chemical, the fate of the chemical, and the amount and duration of human or other exposure to the chemical after it is released. Listed below are some of the factors that should be considered when reviewing TRI data. Box 1-3 highlights some of these factors.

Toxicity of the Chemical

The TRI list consists of chemicals that vary widely in their ability to produce toxic effects.

- Some high-volume releases of less toxic chemicals may appear to be a more serious problem than lower-volume releases of more toxic chemicals, when just the opposite may be true. For example, phosgene is toxic in smaller quantities than methanol. A comparison between these two chemicals for setting hazard priorities or estimating potential health concerns, solely on the basis of volumes released, may be misleading.

Exposure Considerations

- **Potential degradation or persistence of the chemical in the environment.** Exposure to a chemical is dependent upon the chemical being available. The longer the chemical remains unchanged in the environment, the greater the potential for exposure. Sunlight, heat, or microorganisms may or may not decompose the chemical.
  - For example, microorganisms readily degrade some chemicals, such as methanol, into less toxic chemicals; volatile organic compounds, such as ethylene and propylene, react in the atmosphere and contribute to the formation of smog; metals are persistent and will not degrade upon release to the environment.
  - As a result, smaller releases of a persistent, highly toxic chemical may create a more serious problem than larger releases of a chemical that is rapidly converted to a less toxic form.
- **Bioconcentration of the chemical in the food chain.** As a chemical becomes incorporated in the food chain, it may concentrate or disperse as it moves up the food chain.
  - Some chemicals, such as mercury, accumulate as they move up the food chain.
  - Small releases of a chemical that bioaccumulates may result in significant exposures to consumers.
- **The environmental medium (air, water, land, or underground injection) to which the toxic chemical has been released.** Chemical exposure of a population depends on the environmental medium to which a chemical is released. The medium also affects the types of exposures possible, such as inhalation, dermal exposure, or ingestion.
  - Releases of a chemical to the air can result in exposures to organisms living near and downwind from facilities releasing toxic chemicals to the atmosphere. Persistent

Box 1-3: Factors to Consider in Using TRI Data

Toxicity of the Chemical: TRI chemicals vary in their ability to produce toxic effects. Some high-volume releases of less-toxic chemicals may appear to be a more serious problem than lower-volume releases of highly toxic chemicals, when just the opposite may be true.

Exposure Considerations: The potential for exposure may be greater the longer the chemical remains unchanged in the environment. Sunlight, heat, or microorganisms may or may not decompose the chemical. For example, microorganisms readily degrade some chemicals, such as methanol, into less-toxic chemicals, whereas metals are persistent and will not degrade when released to the environment. Chemical exposure of a population depends on the environmental medium (air, water, land, etc.) to which a chemical is released. The medium also affects the types of exposures possible, such as inhalation, dermal exposure, or ingestion.

chemicals may fall or precipitate from air onto land or into water bodies, resulting in exposures via these environmental media.

- Exposures that may result from releases to water bodies (streams, lakes, etc.) depend in part on the downstream uses of the water, including drinking, cooking, and bathing.

- Releases to underground injection wells are regulated by EPA's Underground Injection Control Program to provide safeguards so that injection wells do not endanger current and future underground sources of drinking water. When wells are properly sited, constructed, and operated, underground injection is an effective and environmentally safe method to dispose of wastes.

- Releases to RCRA subtitle C landfills are regulated by EPA's Land Disposal Restrictions (LDR) Program. Land disposal units, such as RCRA subtitle C landfills and surface impoundments, must comply with stringent requirements for liners, leak detection systems, and groundwater monitoring. LDR provides that a hazardous waste cannot be placed on the land until the waste is treated (or meets specific treatment standards) to reduce the mobility or toxicity of the hazardous waste constituents in the waste.

♦ **The type of off-site facility receiving the chemical and the efficiency of its waste management practices**. The amount of a toxic chemical that ultimately enters the environment depends on how the chemical was handled during treatment, energy recovery, or recycling activities. Several factors to keep in mind when considering amounts sent off-site are presented below.

- The efficiency of recycling operations varies depending on the method of recycling and the chemical being recycled.

- Use of a combustible toxic chemical for energy recovery typically results in the destruction of 95% to 99% or more of the toxic chemical. The remaining quantity may be either released to air or disposed of in ash to land.

- The efficiency of the treatment of toxic chemicals in waste sent to sewage treatment plants varies depending on the chemical and the sewage plant. Some high-volume pollutants, such as methanol, are readily degraded by most sewage treatment plants. Other chemicals, such as methyl ethyl ketone (MEK), may be partially treated and partially released. Other high-volume chemicals, such as ammonia, are not readily treated by most sewage treatment plants and will pass through the plant into the aquatic environment. In addition, metals sent to sewage treatment plants may be removed with solid wastes and sent to landfills, or they may pass through the plant and be discharged into surface waters; they are not, however, destroyed.

- The efficiency of other treatment methods, such as incineration, also depends upon the specifications of the treatment facility and the nature of the chemical.

- Toxic chemicals in waste sent off-site for disposal are typically released to land or injected underground.

♦ **On-site waste management of the toxic chemical.** As with off-site waste management, the amount of the toxic chemical released to the environment depends on how the chemical was handled during treatment, energy recovery, or recycling activities. However, since the waste management is on-site, any amount of the chemical that enters the environment after waste management is reported to TRI as part of that facility's releases.

On-site and Off-site Releases

Figure 1-1 (see page 1-12) illustrates on-site and off-site releases, other on-site waste management activities, and transfers off-site for other waste management, reportable to TRI. Box 1-4 describes reportable releases that may occur on-site at the facility and identifies types of activities that may contribute releases to various media. Box 1-5 describes releases that may ultimately result when a facility transfers chemicals off-site for disposal.

As noted in Box 1-5, off-site releases include additional details about off-site transfers of metals and metal category compounds, beginning with reporting year 1997. Box 1-6 explains how facilities should report metals and metal category compounds, and Box 1-7 describes EPA's methodology for using these data in analyses in this report.

Box 1-8 describes EPA's methodology for avoiding duplication of amounts analyzed in off-site releases (transfers to land and underground injection disposal) that are also reported as on-site releases by facilities that received such transfers. This potential for duplication arises now that RCRA subtitle C hazardous waste treatment and disposal facilities also report to TRI.

Waste Management

The PPA of 1990 requires facilities to report information about the quantities of TRI chemicals they manage in waste, both on- and off-site. The PPA established as national policy that source reduction is the preferred approach to managing waste. Source reduction is defined as an activity that prevents the generation of waste. The PPA also established as national policy a hierarchy of waste management options, illustrated in Figure 1-2, for situations where source reduction cannot be implemented feasibly.

Although source reduction is the preferred method of reducing risk, environmentally sound recycling shares many of its advantages. Like source reduction, recycling reduces the need for treatment or disposal of waste and helps conserve energy and natural resources. Where source reduction and recycling are not feasible, toxic chemicals in waste can be treated. Release (including disposal) of a chemical is viewed as a last resort, to be employed only if the preferred methods of waste management cannot be implemented. The PPA did not specifically address the combustion of waste for energy recovery as a waste management option. However, because energy recovery shares aspects of recycling and treatment, EPA chose to list this activity separately in the waste management hierarchy.

Waste management data presented in this book appear in tables and figures in the order of the hierarchy: recycling, energy recovery, treatment, and release (including disposal).

Box 1-9 describes the waste management information facilities must report to TRI. The amount of TRI chemicals in waste reported includes both waste generated by the facility and waste received by the facility for the purpose of further waste management. Facilities report these data as estimates for the reporting year (2001) and the previous year (2000) and as projections for the two following years (2002 and 2003). The PPA requires this data projection to encourage facilities to consider their future waste generation, opportunities for source reduction, and potential improvement in waste man-

Figure 1-2: Waste Management Hierarchy

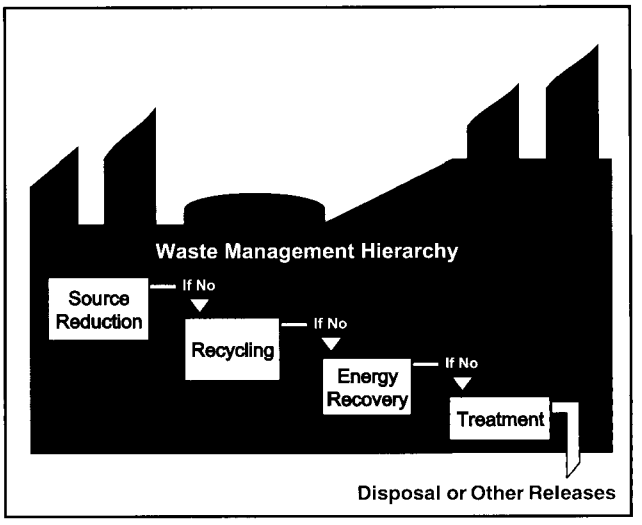
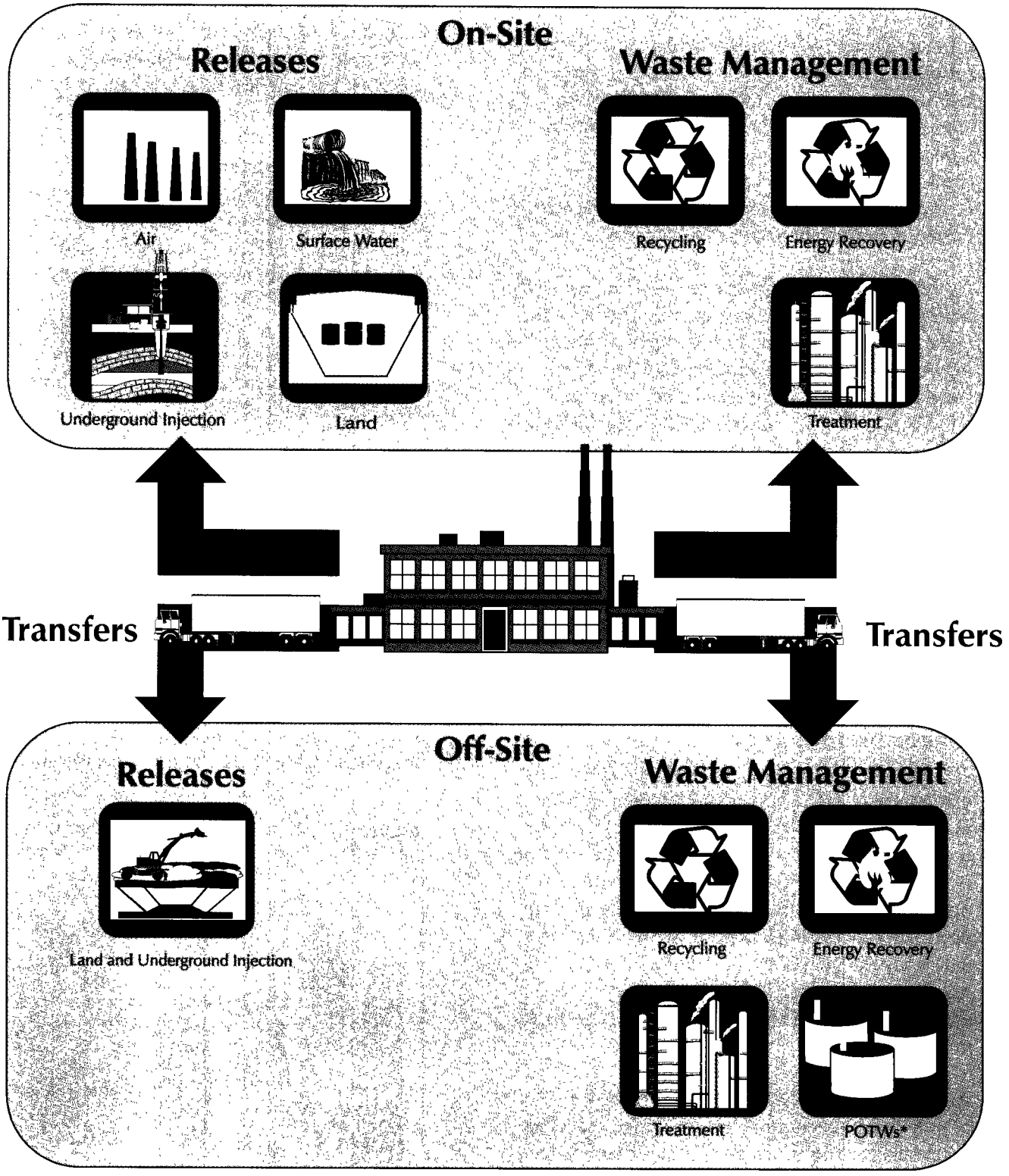


Figure 1-1: Information Collected under TRI



*Publicly Owned Treatment Works

Box 1-4: An Explanation of On-site Releases

A release is a discharge of a toxic chemical to the environment. On-site releases include emissions to the air, discharges to bodies of water, releases at the facility to land, as well as releases into underground injection wells. Releases are reported to TRI by media type. On-site releases are reported in Section 5 of Form R.

Air Emissions. Releases to air are reported either as point source or fugitive emissions. Point source emissions, also referred to as stack emissions, occur through confined air streams, such as stacks, vents, ducts, or pipes. Fugitive emissions are all releases to air that are not released through a confined air stream. Fugitive emissions include equipment leaks, evaporative losses from surface impoundments and spills, and releases from building ventilation systems.

Surface Water Discharges. Releases to water include discharges to streams, rivers, lakes, oceans, and other bodies of water. This includes releases from contained sources, such as industrial process outflow pipes or open trenches. Releases due to runoff, including stormwater runoff, are also reportable to TRI.

Underground Injection. Underground injection is the subsurface emplacement of fluids through wells. TRI chemicals associated with manufacturing, the petroleum industry, mining, commercial and service industries, and federal and municipal government-related activities may be injected into Class I, II, III, IV, or V wells, if they do not endanger underground sources of drinking water (USDW), public health, or the environment. The different types of authorized injection activities are as follows:

- Class I wells include the emplacement of hazardous and nonhazardous fluids (industrial and municipal wastes) into isolated formations beneath the lowermost underground source of drinking water (USDW). Because they may inject hazardous waste, Class I wells are the most strictly regulated and are further regulated under the Resource Conservation and Recovery Act.
- Class II includes injection of brines and other fluids associated with oil and gas production.
- Class III encompasses injection of fluids associated with solution mining of minerals.
- Class IV addresses injection of hazardous or radioactive wastes into or above a USDW and is banned unless authorized under other Statutes for ground water remediation.
- Class V wells inject nonhazardous fluids into or above a USDW and are typically shallow, on-site disposal systems, such as floor and sink drains which discharge directly or indirectly to ground water, dry wells, leach fields, and similar types of drainage wells.

Beginning with the 1996 reporting year, facilities separately report amounts injected into Class I wells and into all other wells. This change was made to recognize the difference in management and regulatory oversight provided by the Underground Injection Control Program for Class I wells as distinguished from other forms of injection reportable to TRI.

On-site Land Releases. On-site releases to land occur within the boundaries of the reporting facility. Releases to land include:

- Disposal of toxic chemicals in landfills in which wastes are buried,
  - RCRA subtitle C landfills, which are landfills that comply with stringent requirements for liners, leak detection systems, and groundwater monitoring,
  - Other landfills,
- Land treatment/application farming, which are management techniques in which a waste containing a listed chemical is applied to or incorporated into the soil,
- Surface impoundments that are uncovered holding areas used to volatilize and/or settle waste materials, and
- Other land disposal methods, which include waste piles, spills or leaks.

Beginning with the 1996 reporting year, facilities separately report amounts released to RCRA subtitle C landfills from amounts released to other on-site landfills. This change was made to recognize the difference in management and regulatory oversight provided for RCRA subtitle C landfills as distinguished from other landfills.

Box 1-5: An Explanation of Off-site Releases (Transfers Off-site to Disposal)

An off-site release is a discharge of a toxic chemical to the environment that occurs as a result of a facility's transferring a waste containing a TRI chemical off-site to disposal, as reported in Section 6 of Form R. Certain other types of transfers are also categorized as off-site releases because, except for location, the outcome of transferring the chemical off-site is the same as releasing it on-site.

Transfers to Disposal - Land. Toxic chemicals in waste may be transferred off-site for disposal in landfills or other types of land disposal. (See discussion of on-site releases to land for a description of these release types.)

Transfers to Disposal – Underground Injection. Toxic chemicals in waste may be transferred off-site to sites that inject the wastes underground. (See discussion of on-site underground injection for a description of these release types.)

Storage Only. Generally, a toxic chemical is sent off-site for storage because there is no known disposal method. One example is toxic chemicals in mixed hazardous and radioactive waste. EPA considers this an off-site release because this method is being used as a form of disposal and the toxic chemical will remain there indefinitely.

"Unknown." The "unknown" category of disposal indicates that a facility is not aware of the type of waste management used for the toxic chemical that is sent off-site. Therefore, EPA has categorized this method as the lowest type of waste management (environmentally least desirable) and has included it as a type of disposal for reporting purposes. Thus, it is considered to be an off-site release.

Metals and Metal Category Compounds. Transfers of metals and metal category compounds to solidification/stabilization, to wastewater treatment (excluding POTWs), and to publicly owned treatment works (POTWs, or municipal sewage treatment) also result in releases and are classified as off-site releases (transfers to disposal) (see Box 1-6).

Box 1-6: How Metals and Metal Category Compounds Should be Reported to TRI

In Section 6.2 of Form R, facilities report the amounts sent to each off-site location to which the facility ships or transfers wastes containing the reported toxic chemical for the purposes of recycling, energy recovery, treatment, or disposal. Metals and metal category compounds are managed in waste either by being released (including disposal) or by being recycled. The metal has no heat value and thus cannot be combusted for energy recovery and cannot be treated because it cannot be destroyed regardless of whether the stream containing the metal is sent for energy recovery or treatment. Thus, transfers of metals and metal category compounds for further waste management should be reported as either a transfer for recycling or a transfer for disposal. The applicable waste management code for transfers of metals and metal category compounds for recycling is M24. Applicable codes for transfers for disposal include M10, M41, M62, M71, M72, M73, M79, M90, M94, and M99. Two codes, M41 and M62, were new for the 1997 reporting year. These codes are for transfers to waste management in which the wastestream may be treated but the metal contained in the wastestream is not treated and is ultimately released. For example, M41 would be used for a metal or metal category compound which is stabilized in preparation for disposal.

Prior to the 1997 reporting year, some facilities reported transfers of metals and metal category compounds for further waste management using two waste treatment codes, M40 and M61. Beginning in reporting year 1997, metals and metal category compounds must be reported using one of the 10 disposal codes or the applicable recycling code (M24 for metals recovery).

Off-site Transfers for Further Waste Management: Codes for Section 6.2 of Form R

Recycling
M 20 Solvents/Organics Recovery
M 24 Metals Recovery
M 26 Other Reuse or Recovery
M 28 Acid Regeneration
M 93 Transfer to Waste Broker-Recycling

Energy Recovery
M 56 Energy Recovery
M 92 Transfer to Waste Broker–Energy Recovery

Treatment
M 40 Solidification/Stabilization
M 50 Incineration/Thermal Treatment
M 54 Incineration/Insignificant Fuel Value
M 61 Wastewater Treatment (Excluding POTWs)
M 69 Other Waste Treatment
M 95 Transfer to Waste Broker–Waste Treatment

Disposal
M 10 Storage Only
M 41 Solidification/Stabilization–Metals and Metal Compounds only
M 62 Wastewater Treatment (Excluding POTWs)–Metals and Metal Compounds only
M 71 Underground Injection
M 72 Landfill/Disposal Surface Impoundment
M 73 Land Treatment
M 79 Other Land Disposal
M 90 Other Off-site Management
M 94 Transfers to Waste Broker–Disposal
M 99 Unknown

Box 1-6: How Metals and Metal Category Compounds Should be Reported to TRI *(continued)*

In Section 6.1 of Form R, facilities report amounts of listed chemicals transferred to publicly owned treatment works (POTWs). Because metals are not destroyed by sewage treatment processes, amounts of metals and metal category compounds reported in Section 6.1 are considered transfers to disposal.

In Section 8.1 of Form R, facilities report quantities of listed chemicals released on- and off-site (excluding one-time catastrophic or remedial releases). Except for those quantities recycled, metals and metal category compounds should be reported in Section 8.1 of the Form R. This includes those quantities of metals and metal category compounds reported in:

- Section 5 as on-site releases
- Section 6.2 as sent off-site for stabilization/solidification (M41) or wastewater treatment (excluding POTWs) (M62) and/or,
- Section 6.1 as discharges to POTWs.

These quantities should not be reported in Section 8.7 of the Form R.

Box 1-7: Use of Data for Metals and Metal Category Compounds in This Report

Off-site releases (transfers to disposal) in tables in this report include the quantities of metals and metal category compounds that were reported using the incorrect waste management codes, M40 and M61, in Section 6.2 (e.g., waste treatment codes instead of recycling or disposal codes) along with the quantities of metals and metal category compounds that were reported correctly in Section 6.2. For the years prior to 1997, EPA has also included the quantities of metals and metal category compounds that were reported using the two waste management codes, M40 and M61, as off-site releases rather than off-site waste treatment. In addition, when discussing off-site releases of TRI chemicals, EPA has included those quantities of metals and metal category compounds reported as discharges to POTWs in Section 6.1 of the Form R.

Chemicals considered to be metals and metal category compounds in this report appear in the tables in Appendix B.

agement options as presented in the hierarchy. Future-year estimates are not commitments that facilities reporting to TRI must meet.

The individual waste management quantities reported are mutually exclusive to avoid double-counting. For example, an incinerator may destroy 99% of the chemical in the waste; in this case, the amount reported as treated on-site would be the amount destroyed by the incinerator, not the amount that entered the incinerator. The amount not destroyed in incineration (1%) would be reported as released. The sum of the individual quantities in a given year equals the total quantity of TRI chemicals in waste resulting from routine production operations at a facility during that year.

For the reporting year only, facilities must also report the quantity of waste released (including disposal) as a result of activities other than routine production operations. This quantity appears in data tables in this book as "non-production-related waste managed." It includes waste released to the environment at the facility or transferred off-site because of catastrophic events or remedial (clean-up) actions at the facility. Non-production-related waste is considered less amenable to source reduction because facilities cannot reasonably anticipate these quantities.

It is important to note that facilities may vary in how they interpret some of the reporting requirements under the PPA. EPA has not yet specifically defined in regulations the reporting requirements for these data elements, so some facilities may include in their reports amounts that other facilities do not believe they must include. Because of this, higher quantities of TRI chemicals in waste for a particular state or industry may reflect not only differences in actual quantities, but also different interpretations of the reporting requirements.

Box 1-10 explains the differences between "total on- and off-site releases" and "quantity released on- and off-site."

Box 1-8: Duplication of Off-site Transfers to Disposal

TRI facilities transfer off-site chemicals in waste to other facilities for disposal. These recipient facilities can dispose of the wastes in on-site landfills, disposal surface impoundments, in land treatment facilities, or by using other types of land disposal methods. They may also dispose of wastes in underground injection wells or, if metals and metal category compounds are sent to a wastewater treatment facility, they may be discharged to surface waters. The recipient facilities generally are treatment, storage and disposal (TSD) facilities regulated under the federal Resources Conservation and Recovery Act (RCRA). Such facilities are one of the added industries that must, beginning with the 1998 reporting year, report their releases, transfers, and other waste management to TRI. Thus, the facility that sends these transfers would report to TRI the amounts as transfers to disposal (off-site releases) and the TSD facility that receives the material would report the amounts as on-site releases to land, surface waters, or underground injection.

To avoid counting the transfers to the TSD facilities that are also reported to TRI as on-site releases by the TSD facilities, off-site transfers to disposal to these TSD facilities must be omitted from tables that compare or summarize on-site and off-site releases for all industries, including the industries added in 1998. Only the on-site releases from the TSD facilities are included in such analyses. In the *2001 TRI Public Data Release*, this applies to tables presented in Chapters 2 and 3.

The RCRA ID number that facilities report was used to identify such transfers and match them to on-site releases reported by TSD facilities. A TRI facility must report its own RCRA ID number as well as the RCRA ID number of the TSD facility receiving the transfer. Each amount of off-site transfer to disposal should have the RCRA ID number of the receiving facility. If this RCRA ID number matches the RCRA ID number of a TRI facility and the TRI facility receiving the waste reported on-site releases of the same chemical (or the metal and its compounds in the case of metals) that were greater than or equal to the sum of the off-site transfers received, then the off-site transfer amount is omitted from the analysis.

If the TRI facility receiving the waste reported on-site releases of the chemical less than the total reported as transferred to the facility, then the amount omitted from the analysis is reduced proportionally. For example, if Facility A reported 20,000 pounds transferred to Facility C and Facility B reported 80,000 pounds transferred to Facility C, but Facility C only reported 90,000 pounds released on-site (which is 90 percent of the total amount of 100,000 pounds reported as transferred), then the amount of transfers omitted from the analysis for Facility A is 18,000 pounds (or 90 percent of 20,000 pounds) and for Facility B is 72,000 pounds (or 90 percent of 80,000 pounds).

In tables that present off-site transfers but not on-site releases, these amounts are not omitted in order to present complete data on off-site transfers for analysis. Also, tables that present data on waste managed do not omit any reported data in order to present complete data on how waste is being managed.

The following shows which types of off-site transfers to disposal are matched with which types of on-site releases to determine if the transfers should be omitted:

Off-site Transfer M Code	Section 5 Checked for Recipient TRI Facilities Based on Matching Chemical or, if Metal, Metal plus Metal Category Compounds
M10	5.5.4
M41*	5.5.1 A and B
M62*	5.5.1 A and B, 5.5.3 and 5.3
M71	5.4
M72	5.5.1 A and B, 5.5.3
M73	5.5.2
M79	5.5.4
M90	All Section 5
M99	All Section 5

*Includes metals and metal category compounds reported under codes M40 and M61.

Box 1-9: An Explanation of Waste Management Information

Information about facilities' management of TRI chemicals in waste is reported in Section 8 of Form R.

Recycled On-site. This is the quantity of the toxic chemical recovered at the facility and made available for further use. To avoid double-counting, the amount reported represents the amount exiting the recycling unit. It is not the quantity that entered an on-site recycling or recovery operation. For example, 3,000 pounds of a listed chemical enters a recycling operation. Of this, 500 pounds of the chemical are in residues from the recycling operation that are subsequently sent off-site for disposal. The quantity reported as recycled on-site would be 2,500 pounds.

Recycled Off-site. This is the quantity of the toxic chemical that left the facility boundary for recycling, not the amount recovered at the off-site location. This quantity includes the amount(s) reported in Section 6 of Form R as transferred off-site for recycling, less any amount(s) associated with non-routine events.

Used for Energy Recovery On-site. This is the quantity of the toxic chemical that was combusted in some form of energy recovery device, such as a furnace (including kilns) or boiler. The toxic chemical should have a heating value high enough to sustain combustion. To avoid double-counting, the amount reported represents the amount destroyed in the combustion process, not the amount that entered the energy recovery unit. For example, 100,000 pounds of toluene entered a boiler that, on average, combusted 98% of the toluene. Any remaining toluene was discharged to air. A total of 98,000 pounds is reported as combusted for energy recovery (the remaining 2,000 pounds is reported as released).

Used for Energy Recovery Off-site. This is the quantity of the toxic chemical that left the facility boundary for energy recovery, not the amount combusted at the off-site location. The toxic chemical must have a significant heating value, and the off-site location must have some form of energy recovery unit in place. This quantity includes the amount(s) reported in Section 6 of Form R as transferred off-site for energy recovery, less any amount(s) associated with non-routine events.

Treated On-site. This is the quantity of the toxic chemical destroyed in on-site waste treatment operations, not the amount that entered a treatment operation. For example, if 100,000 pounds of benzene were combusted in an incinerator that destroyed 99% of the benzene, the facility would report 99,000 pounds as treated on-site (the remaining 1,000 pounds would be reported as released).

Treated Off-site. This is the quantity of the toxic chemical that left the facility boundary and was sent to POTWs or other off-site locations for treatment, not the amount that was destroyed at the off-site location(s). This quantity includes the amount(s) reported in Section 6 of Form R as transferred to POTWs or other off-site locations for treatment, less any amount(s) associated with non-routine events and not including quantities of metals and metal category compounds (see Box 1-6).

Released On- and Off-site. This is the total quantity of the toxic chemical that was released to the environment or disposed of at the facility (directly discharged to air, land, and water, and injected underground) or sent off-site for disposal. This quantity is the sum of the amounts reported in Sections 5 and 6 of Form R (releases plus transfers to disposal and transfers to POTWs of metals and metal category compounds) less any amount(s) associated with non-routine events.

Released to the Environment Due to One-time Events. This amount is referred to as non-production-related waste and is the quantity released to the environment or sent off-site for recycling, energy recovery, treatment, or disposal due to one-time events not associated with routine production practices. Such events include catastrophic events, such as accidental releases, as well as remedial actions (clean up). This quantity is separated from the quantities recycled, used for energy recovery, treated, and released, to distinguish between quantities that are routinely associated with production operations and are more amenable to source reduction and those that are not routinely associated with production processes and are not so amenable to source reduction because they are not readily anticipated (e.g. releases due to damage from a tornado). This separation is important in assessing progress in source reduction at facilities.

Box 1-10: Differences between Amounts Reported in Sections 5 and 6 and in Section 8 of Form R

"Total on- and off-site releases" and "quantity released on- and off-site" are not the same. This difference arises primarily from the types of releases reported on different sections of the Form R. "Total on- and off-site releases" reflects all on-site releases as collected in Section 5 of the Form R and transfers off-site for disposal as reported in Section 6 (including metals and metal category compounds as described in Box 1-6). However, "quantity released on- and off-site" is limited to production-related on- and off-site releases as collected in Section 8.1 of the Form R. Although total amounts analyzed in these two categories are often the same, production-related releases reported in Section 8.1 do not include those releases associated with catastrophic events, remedial actions, or other one-time events not related to production. For the same reason, transfers for recycling, energy recovery, and treatment (including POTWs for non-metals) reported in Section 6 do not exactly correspond with similar quantities reported in Section 8. Once again, the relevant parts in Section 8 include only production-related wastes whereas Section 6 includes all off-site waste management amounts.

Other reasons also contribute to the different quantities reported in different sections of the Form R. For example, a release or transfer of less than 1,000 pounds may be reported in ranges in Section 5 and 6 whereas an exact amount must be included in Section 8. Furthermore, facilities may round off the quantities reported in Section 8 to two significant digits.

Transfers Off-site for Further Waste Management

Box 1-11 describes off-site transfers to recycling, energy recovery, treatment, and POTWs that TRI facilities must report.

Making Year-to-Year Comparisons of TRI Data

Year-to-year comparisons must be based on a consistent set of reporting requirements to assure that any changes in releases or waste management data do not simply reflect expansion of TRI's chemical and industry coverage or other modifications in reporting requirements over the course of the years. Therefore, trend analyses have been undertaken using various baseline years, as described below.

1998–2001

EPA has made changes during the 1998–2001 period to the list of chemicals that must be reported and to reporting thresholds for some chemicals. EPA has the authority both to add chemicals to the TRI reporting list if they meet the statutory toxicity criteria and to delete chemicals from the list if EPA determines that they do not meet the toxicity criteria. For the 2000 reporting year, PBT chemicals already on the list had the reporting thresholds lowered and other PBT chemicals were added to the list. The reporting threshold for the PBT lead and lead compounds (except when lead is contained in stainless steel, brass, or bronze alloys) was lowered for the 2001 reporting year. The PBT chemicals are excluded from analyses of the 1998–2001 data.

In addition, vanadium compounds were added to the list and vanadium was changed to exclude vanadium when contained in alloys for the 2000 reporting year. Vanadium and vanadium compounds are excluded from analyses of the 1998–2001 data.

1988–2001

Analyses for the period 1988 to 2001 exclude chemicals added to TRI since 1988 and those for which reporting requirements have changed over that time. Also, reporting by industry sectors added in 1998 is excluded from the data for 1998–2001 for analyses covering the 1988–2001 period. Additional considerations also apply to analyses of TRI data for 1988 to 2001, including:

- In 1989, the reporting thresholds for manufacture and processing of TRI chemicals were reduced from 50,000 pounds to 25,000 pounds. This may affect data for 1988 and 1989, but not for subsequent years.
- Off-site transfers to recycling and energy recovery became reportable in 1991. Comparisons between 1988 and later years include only the transfer types that were reportable in 1988.
- Reporting of amounts injected underground into Class I wells separately from amounts injected

Box 1-11: An Explanation of Transfers Off-site for Further Waste Management

An off-site transfer, reported in Section 6 of Form R, is the transfer of toxic chemicals in waste to a facility that is geographically or physically separate from the facility reporting under TRI. Chemicals reported to TRI as transferred are sent to off-site facilities for the purposes of recycling, energy recovery, treatment, or disposal. The amounts reported represent a movement of the chemical away from the reporting facility. Except for off-site transfers to disposal, these amounts do not necessarily represent entry of the chemical into the environment. Transfers to disposal represent an off-site release (see Box 1-5).

Transfers Off-site to Recycling. Toxic chemicals in waste that are sent off-site for the purposes of recycling are generally recovered by a variety of recycling methods, including solvent recovery and metals recovery. The choice of the recycling method depends on the toxic chemical being sent for recycling. Once they have been recycled, these chemicals may be returned to the originating facility for further processing or made available for use in commerce.

Transfers Off-site to Energy Recovery. Toxic chemicals in waste sent off-site for purposes of energy recovery are combusted off-site in industrial furnaces (including kilns) or boilers that generate heat or energy for use at that location. Treatment of a chemical by incineration is not considered to be energy recovery.

Transfers Off-site to Treatment. Toxic chemicals in waste that are transferred off-site may be treated through a variety of methods, including biological treatment, neutralization, incineration, and physical separation. These methods typically result in destruction of the toxic chemical.

Transfers to Publicly Owned Treatment Works (POTWs). A POTW is a wastewater treatment facility that is owned by a state or municipality. Wastewaters from facilities reporting under TRI are transferred through pipes or sewers to a POTW. Treatment or removal of a chemical from the wastewater depends upon the nature of the chemical, as well as the treatment methods present at the POTW. In general, chemicals that are easily utilized as nutrients by microorganisms, or have a low solubility in water, are likely to be removed to some extent. Chemicals that are volatile and have a low solubility in water may evaporate into the atmosphere. Not all TRI chemicals can be treated or removed by a POTW. Some chemicals, such as metals, may be removed, but are not destroyed and may be disposed of in landfills or discharged to receiving waters; transfers of metals and metal category compounds to POTWs are categorized as off-site releases, as explained in Boxes 1-5 and 1-6.

Other Off-site Transfers. In this report, toxic chemicals in waste that were reported as transferred off-site but for which the off-site activity (i.e., recycling, energy recovery, treatment, or disposal) was not specified or was not an accepted code have been classified as "other off-site transfers."

into underground wells of other classes (II–V), and reporting of on-site land releases to RCRA subtitle C landfills separately from other types of on-site land releases began in 1996. These release types cannot be analyzed separately for 1988 and later years.

Appendix G presents total releases for 1988-2001 by industry sector.

Other Changes

Several other changes in the TRI reporting requirements over the years will affect comparisons of other groups of years. They include chemicals added in 1990, 1991, 1994, 1995 and 2000, industry sectors added in 1998, changes in reporting requirements for ammonia, hydrochloric acid and sulfuric acid in 1994 and 1995 and several chemicals that have been deleted over the years. These chemicals and industry sectors are excluded from analyses that include years before the changes were made.

Other changes include the types of data reported. The PPA of 1990 required reporting of on- and off-site waste management data and off-site transfers to recycling and energy recovery beginning with the 1991 reporting year so this information can only be analyzed for years 1991 and later.

Appendix G presents total releases for 1988-2001 and 1995-2001 and waste management data for 1991-2001 and 1995-2001 by industry sector.

Reasons for Change

Box 1-12 provides reasons that a facility's reported amounts may change from one year to another. Explanations for changes in reported amounts

Box 1-12: Reasons Facility Estimates of Releases and Other Waste Management Change

Some reported increases and decreases are real—that is, they reflect changes in the amounts of TRI chemicals actually released or otherwise managed in waste. Other reported increases and decreases are accounting or "paper" changes that do not reflect change in releases or other waste management. Some examples follow.

Real Changes

Source reduction activities, such as process changes, elimination of spills and leaks, inventory control, improved maintenance, chemical substitution, and alternative methods of cleaning and degreasing can cause real reduction in the amount of waste generated and/or managed.

The installation of pollution control equipment does not reduce the amount of waste generated, but may lead to real reductions in TRI chemicals released. However, if the pollution control does not destroy the reported chemical, it may merely shift the chemical from one type of waste management to another.

Production changes can cause real changes in the quantities of TRI chemicals released or otherwise managed as waste by facilities. Production-related waste is likely to increase when production increases and decrease when production decreases, although the relationship is not necessarily linear.

One-time events unrelated to normal production processes, such as accidental releases or clean-up operations, can cause a real but anomalous increase in the reporting year in which they occur and then a decrease from that abnormally high level the following year.

"Paper" Changes

Changes in estimation or calculation techniques can cause a change in the amount reported without a corresponding change in actual quantities of the chemical released or otherwise managed as waste.

Clarifications of reporting instructions or changes in the way a facility interprets those instructions may cause a change in reported amounts without an actual change in quantities of the chemical released or otherwise managed as waste.

Changes in the reporting definition of a particular chemical may cause a change in the reported amounts without an actual change in quantities released or otherwise managed as waste. For example, revising the definitions of sulfuric acid and hydrochloric acid to include only aerosol forms, as occurred in reporting years 1994 and 1995, resulted in lower reports of releases, when non-aerosol forms were no longer reported.

Similarly, a facility's use of the alternate threshold may result in a reported decrease without an actual reduction in releases if the facility begins to take advantage of an alternate manufacture, process, or otherwise use threshold of more than 1 million pounds. Beginning in the 1995 reporting year, some facilities whose "total annual reportable amount" for a reportable chemical does not exceed 500 pounds may use an alternate manufacture, process, or otherwise use threshold of more than 1 million pounds of the chemical. If they do not exceed this alternate threshold, they no longer need to report amounts of releases or other waste management activities.

Apparent increases or decreases can occur if a facility makes a reporting error one year and does not submit a revision for that year, but does not repeat the error the following year.

Box 1-13: What Is Source Reduction?

Through source reduction, risks to people and the environment can be reduced, financial and natural resources can be saved that would otherwise have to be expended on environmental clean-up or pollution control, and industrial processes can become more efficient. Source reduction is defined in the Pollution Prevention Act of 1990 as any practice that:

- reduces the amount of any hazardous substance, pollutant, or contaminant entering any wastestream or otherwise released into the environment (including fugitive emissions); and
- reduces the hazards to public health and the environment associated with the release of such substances, pollutants, or contaminants.

Source reduction practices can include modifications in equipment, process, procedure, or technology, reformulation or redesign of products, substitution of raw materials, and improvements in maintenance and inventory controls. Under this definition, waste management activities, including recycling, treatment, and disposal, are not considered forms of source reduction.

include actual source reduction projects undertaken to reduce a facility's generation of waste of a particular chemical, increases or decreases in production levels, changes in a facility's methods of estimating or calculating reportable amounts (which does not indicate a corresponding change in actual releases and waste management), reporting errors in previous years for which the facility has not filed a revised submission, and others.

Apparent increases and decreases among industries can also result when facilities change the SIC codes they report from one year to another, reflecting new or discontinued facility operations or indicating a different understanding of how SIC codes relate to the facility's business.

Source Reduction

As noted above, the PPA of 1990 requires facilities to report the quantities of TRI chemicals they manage in waste, both on- and off-site. The PPA also requires facilities to provide information about the efforts they have made to reduce or eliminate those quantities. With the 1991 reporting year, facilities began reporting to TRI information about any source reduction activities they implemented during the year.

Source reduction activities are undertaken to reduce the amount of a toxic chemical which enters a wastestream or is otherwise released to the environment. By reducing the generation of toxic chemicals in waste, source reduction activities reduce the need to recycle, treat, or dispose of toxic chemicals. Box 1-13 explains source reduction as defined by the PPA.

A reported source reduction activity could have been implemented at any time during the reporting year. This is important to consider when analyzing the impact that source reduction activities may have had on the total quantity of waste that a facility managed during the year. Undertaking a source reduction activity late in the reporting year would have a smaller impact on the amount of waste that was managed during the year than implementing the same activity earlier in the year.

HOW CAN I OBTAIN ADDITIONAL TRI INFORMATION?

The TRI data are available in on-line databases and in a variety of common computer and hard copy formats to ensure that everyone can easily use the information. Information about accessing the TRI database is provided on the inside front cover of this report. The TRI User Support Service (**202-566-0250**, **<tri.us@epa.gov>**) can provide assistance in accessing and using the TRI data. On-line services include the TRI Explorer, EPA's Envirofacts, the National Library of Medicine's TOXNET system, and the Right-to-Know Network (RTK NET).

To request copies of TRI and EPCRA documents or to obtain further information about the program, contact the toll-free EPCRA Call Center at **1-800-424-9346.** TRI information is also available on the TRI Web site at http://www.epa.gov/tri.

Other potential sources of TRI information include the state EPCRA section 313 contacts, the EPA Regional Offices, or the facilities themselves. EPA regional and state EPCRA section 313 contacts appear in Appendix E of this report, the *2001 TRI Public Data Release: State Fact Sheets* and on the TRI Web site.

Chapter 2

Toxics Release Inventory Data by Industry, 2001 and 1998-2001

Chapter 2

Toxics Release Inventory Data by Industry, 2001 and 1998-2001

This chapter provides an overview of TRI data by industry sector. It summarizes release and other waste management data by industry for 2001, for 2000 to 2001 and for 1998 to 2001. For the definition of types of releases and other waste management activities, and for important information on factors to consider when using TRI data, see Chapter 1. In particular, the discussion in **Making Year-to-Year Comparisons of TRI Data** in Chapter 1 is important for accurate interpretation of these data because of the changes in TRI reporting requirements over time.

Box 2-1 contains an explanation of SIC codes and their use in TRI. Box 2-2 lists the TRI industries by Standard Industrial Classification (SIC) code. Tables in this chapter also present data submitted on TRI chemical forms that report more than one SIC code in the manufacturing sector. Box 2-3 explains EPA's method for analyzing this "multiple-codes" group, as well as the "no-codes" group.

TRI DATA FOR 2001

In 2001, a total of 24,896 facilities submitted 95,513 forms, as shown in Table 2-1. The chemical manufacturing industry submitted the largest number of forms, 20,355. The fabricated metals industry ranked second, with 8,089 forms, followed by the primary metals industry, with 7,445 forms and electric utilities, with 6,634 forms. Together, these four industries submitted nearly half (44.5 percent) of the forms for 2001.

On- and Off-site Releases, 2001

On- and off-site releases totaled almost 6.16 billion pounds in 2001, and two industries, metal mining and electric utilities, reported more than half of that total. As shown in Table 2-2, metal mining facilities

Box 2-1: SIC Codes and Their Use in TRI

Standard Industrial Classification (SIC) codes are used throughout the federal government to classify economic activity by industry. Facilities in the manufacturing sectors—that is, SIC codes 20 through 39—have been required to report releases since the TRI program began. Federal facilities have been required to report to TRI since 1994, regardless of their SIC code. In 1998, seven additional industries began reporting. They are metal mining, coal mining, electric utilities that combust coal and/or oil, chemical wholesale distributors, petroleum bulk terminals/bulk storage facilities, hazardous waste treatment and disposal facilities and solvent recovery facilities. See **Who Must Report?** in Chapter 1 for the SIC codes covered in these industry sectors.

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

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

Box 2-2: Standard Industrial Classification (SIC) Codes for TRI Industries

10 Metal Mining
Mining of metals ores, including copper, lead, zinc, gold, silver and nickel ores, but not including uranium, radium and vanadium ores or services related to metal mining.

12 Coal Mining
Mining of coal, including bituminous coal and lignite surface mining, bituminous coal underground mining, and anthracite mining, but not including services related to coal mining.

20 Food and kindred products
Manufacture or processing of foods and beverages for human consumption, and related products, such as manufactured ice, chewing gum, vegetable and animal fats and oils, and prepared feeds for animals and fowls.

21 Tobacco products
Manufacture of cigarettes, cigars, smoking and chewing tobacco, snuff, and reconstituted tobacco. Stemming and redrying of tobacco. Manufacture of non-tobacco cigarettes.

22 Textile mill products
Preparation of fiber and subsequent manufacture of yarn, thread, braids, twine, and cordage. Manufacture of broadwoven fabrics, narrow woven fabrics, knit fabrics, and carpets and rugs from yarn. Dyeing and finishing of fiber, yarn, fabrics, and knit apparel. Coating, waterproofing, or otherwise treating fabrics. Integrated manufacture of knit apparel and other finished articles from yarn. Manufacture of felt goods, lace goods, nonwoven fabrics, and miscellaneous textiles.

23 Apparel and other finished products made from fabrics and similar materials
Production of clothing. Fabrication of products by cutting and sewing purchased woven or knit textile fabrics and related materials, such as leather, rubberized fabrics, plastics, and furs. Manufacture of clothing by cutting and joining (e.g., by adhesives) material such as paper and nonwoven textiles.

24 Lumber and wood products, except furniture
Cutting timber and pulpwood. Also, merchant sawmills, lath mills, shingle mills, cooperage stock mills, planing mills, and plywood mills and veneer mills engaged in producing lumber and wood basic materials. Manufacture of finished articles made entirely or mainly of wood or related materials.

25 Furniture and fixtures
Manufacture of household, office, public building, and restaurant furniture, and office and store fixtures.

26 Paper and allied products
Manufacture of pulps from wood and other cellulose fibers and from rags. Manufacture of paper and paperboard. Manufacture of paper and paperboard into converted products, such as paper coated off the paper machine, paper bags, paper boxes, and envelopes. Manufacture of bags from plastic film and sheet.

27 Printing, publishing, and allied industries
Printing by one or more common processes, such as letterpress, lithography (including offset), gravure, or screen. Bookbinding, platemaking, and other services performed for the printing trade. Publishing newspapers, books, and periodicals (whether or not the establishment also prints them).

28 Chemicals and allied products
Production of basic chemicals. Manufacture of products by predominantly chemical processes. There are three general classes of products: 1) basic chemicals, such as acids, alkalis, salts, and organic chemicals; 2) chemical products to be used in further manufacture, such as synthetic fibers, plastics materials, dry colors, and pigments; 3) finished chemical products to be used for ultimate consumption, such as drugs, cosmetics, and soaps, or to be used as materials or supplies in other industries, such as paints, fertilizers, and explosives.

29 Petroleum refining and related industries
Production of gasoline, kerosene, distillate fuel oils, residual fuel oils, and lubricants, through fractionation or straight distillation of crude oil, redistillation of unfinished petroleum derivatives, cracking, or other processes. (Establishments also produce aliphatic and aromatic chemicals as byproducts.)

30 Rubber and miscellaneous plastics products
Manufacture of products, not elsewhere classified, from plastics resins and from natural, synthetic, or reclaimed rubber, gutta percha, balata, or gutta siak. Includes manufacture of tires.

31 Leather and leather products
Tanning, currying, and finishing hides and skins. Converting leather. Manufacture of finished leather and artificial leather products and some similar products made of other materials.

Box 2-2: Standard Industrial Classification (SIC) Codes for TRI Industries, *continued*

32 Stone, clay, glass, and concrete products
Manufacture of flat glass and other glass products, cement, structural clay products, pottery, concrete and gypsum products, cut stone, abrasive and asbestos products, and other products from materials taken principally from the earth in the form of stone, clay, and sand. (May include mining and quarrying activities operated by manufacturing establishments in this group.)

33 Primary metal industries
Smelting and refining ferrous and nonferrous metals from ore, pig, or scrap. Rolling, drawing, and alloying metals. Manufacture of castings and other basic metal products. Manufacture of nails, spikes, and insulated wire and cable. Includes production of coke.

34 Fabricated metal products, except machinery and transportation equipment
Fabrication of ferrous and nonferrous metal products, such as metal cans, tinware, handtools, cutlery, general hardware, non-electric heating apparatus, fabricated structural metal products, metal forgings, metal stampings, ordnance (except vehicles and guided missiles), and a variety of metal and wire products, not elsewhere classified.

35 Industrial and commercial machinery and computer equipment
Manufacture of industrial and commercial machinery and equipment and computers. Manufacture of engines and turbines; farm and garden machinery; construction, mining, and oil field machinery; elevators and conveying equipment; hoists, cranes, monorails, and industrial trucks and tractors; metalworking machinery; special industry machinery; general industrial machinery; computer and peripheral equipment and office machinery; and refrigeration and service industry machinery.

36 Electronic and other electrical equipment and components, except computer equipment
Manufacture of machinery, apparatus, and supplies for the generation, storage, transmission, transformation, and utilization of electrical energy. Manufacture of electricity distribution equipment, electrical industrial apparatus, household appliances, electrical lighting and wiring equipment, radio and television receiving equipment, communications equipment, electronic components and accessories, and other electrical equipment and supplies.

37 Transportation equipment
Manufacture of equipment for transportation of passengers and cargo by land, air, and water. Includes motor vehicles, aircraft, guided missiles and space vehicles, ships, boats, railroad equipment, and miscellaneous transportation equipment, such as motorcycles, bicycles, and snowmobiles.

38 Measuring, analyzing, and controlling instruments, photographic, medical, and optical goods; watches and clocks
Manufacture of instruments (including professional and scientific) for measuring, testing, analyzing, and controlling, and their associated sensors and accessories; optical instruments and lenses; surveying and drafting instruments; hydrological, hydrographic, meteorological, and geophysical equipment; search, detection, navigation, and guidance systems and equipment; surgical, medical, and dental instruments, equipment, and supplies; ophthalmic goods; photographic equipment and supplies; and watches and clocks.

39 Miscellaneous manufacturing industries
Manufacture of products not classified in any other major manufacturing group. Includes jewelry, silverware, and plated ware; musical instruments; dolls, toys, games, and sporting and athletic goods; pens, pencils, and artists' materials; buttons, costume novelties, and miscellaneous notions; brooms and brushes; caskets; and other miscellaneous products.

4911/4931/4939 Electric, Gas, and Sanitary Services
Electric services, limited to facilities that combust coal and/or oil for the purpose of generating electricity for distribution in commerce.

5169 Chemical Wholesale Distributors
Wholesale trade of nondurable goods of chemical and allied products.

5171 Petroleum Terminals/Bulk Storage
Wholesale trade of nondurable goods undertaken at petroleum terminals and bulk storage facilities.

4953 Refuse Systems (Hazardous Waste Treatment and Disposal Facilities)
Facilities managing hazardous waste, limited to facilities regulated under RCRA subtitle C, 42 U.S.C. section 6921 *et seq.*

7389 Business Services (Solvent Recovery Facilities)
Facilities engaged in solvent recovery, limited to facilities primarily engaged in solvents recovery services on a contract or fee basis.

Source: Executive Office of the President, Office of Management and Budget, *Standard Industrial Classification Manual*, 1987.

Box 2-3: Multiple SIC Codes and No SIC Codes

Multiple Codes 20–39. TRI facilities may report up to six four-digit Standard Industrial Classification (SIC) codes that describe their operations. If all the processes or operations that are associated with a facility's releases or other waste management of a TRI chemical can be described by one SIC code, then only one SIC code is reported on the form. If several economic activities, designated by different SIC codes, describe the specific operations at a facility that are associated with releases or other waste management of a TRI chemical, then the facility will report those SIC codes (up to six) on the form it submits for that chemical.

Industrial facilities often conduct interrelated operations. They may, for example, manufacture distinct products using common or related feedstocks. Such products may be classified in similar but separate categories in the SIC system. Thus, many forms submitted to TRI contain more than one industrial classification. When TRI data are analyzed by industry—that is, by SIC code—forms that report more than one SIC code must be categorized separately because they do not fall into the individual industry groups.

The "multiple-codes" category represents forms that report in more than one two-digit SIC code within the manufacturing sector (SIC codes 20–39). For example, a facility may refine petroleum (SIC code 29) and then use that feedstock in the manufacture of chemicals (SIC code 28); it will report on its TRI forms SIC codes in both these industries—for example, SIC codes 2911, petroleum refining, and 2869, industrial organic chemicals. On forms with more than one SIC code, any SIC code that is not within manufacturing (that is, not within the SIC code range 20 to 39) is ignored when assigning a form to an industry category. For example, a form with SIC codes 2642 (manufacture of envelopes) and 5112 (wholesale trade—stationery and office supplies) would be included in SIC code 26.

Forms that have a SIC code within the manufacturing sector as well as a SIC code within the additional industry sectors required to report to TRI beginning with the 1998 reporting year are included in the manufacturing sector SIC code if the facility reported to TRI before 1998. If the facility reported for the first time for 1998 with both manufacturing and other industry codes, it is included in the analyses in this chapter under the other industry code.

No Codes 20–39. Forms that report no SIC code Forms that report no SIC code required to report to TRI are included in these tables under the "No codes 20–39" category. Such forms may include, for example, submissions by federal facilities, all of which are required to report regardless of the SIC code covering their operations. This group also includes forms with no valid SIC code.

reported 2.78 billion pounds of total releases, and electric utilities reported 1.06 billion pounds. These amounts represented 45.2 percent and 17.2 percent, respectively, of all on- and off-site releases in 2001, as illustrated in Figure 2-1.

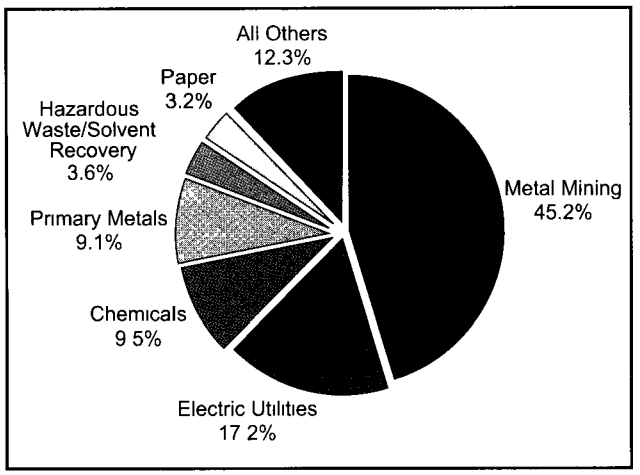
The chemical manufacturing industry ranked third for total on- and off-site releases, with 582.6 million pounds, or 9.5 percent of the total. The primary metals industry reported 558.6 million pounds, or 9.1 percent of the total for 2001.

Two other industry groups reported approximately 200 million pounds each. The hazardous waste/solvent recovery facilities reported 219.9 million pounds (3.6 percent of the total releases in 2001). The paper industry had 195.7 million pounds of releases, or 3.2 percent of the total.

Other on-site land releases (that is, on-site land releases other than RCRA subtitle C landfills) accounted for over half (54.0 percent) of total releases on- and off-site in 2001. The metal mining industry ranked first for other on-site land releases, with 2.76 billion pounds or 82.9 percent of all such type of releases. (Types of on-site land releases are described in Box 1-4 in Chapter 1.)

Air emissions accounted for over one-quarter of all releases (27.3 percent). Electric utilities reported the largest air emissions in 2001, with 717.6 million pounds, or 42.7 percent of all air emissions in 2001. The chemicals industry reported the second largest air emissions, with 227.8 million pounds or 13.6 percent of the total air emissions.

Figure 2-1: TRI Total Releases by Industry, 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 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

Off-site releases (transfers to disposal) accounted for 577.7 million pounds or 9.4 percent of all releases on- and off-site in 2001. The primary metals industry reported the largest off-site releases (transfers to disposal), with 271.8 million pounds or 47.0 percent of all off-site releases.

Table 2-3 shows the amount of total releases on- and off-site for each industry in each state in 2001. Releases by metal mining facilities, the industry with the largest total releases, were concentrated in Nevada, Utah, Arizona and Alaska. These four states accounted for 91.3 percent of all releases reported by metal mining facilities in 2001.

Electric utilities was the industry with the second largest total releases. Electric utilities in North Carolina, Ohio and Pennsylvania reported the largest releases, with facilities in each of these three states reporting more than 75 million pounds in 2001. Almost one-quarter (23.8 percent) of all

Table 2-1: TRI Facilities and Forms, by Industry, 2001

SIC Code	Industry	Total Facilities Number	Total Forms Number	Form Rs Number	Form As Number
10	Metal Mining	89	658	639	19
12	Coal Mining	88	348	285	63
20	Food	1,688	3,611	2,296	1,315
21	Tobacco	31	67	67	0
22	Textiles	289	671	626	45
23	Apparel	16	41	39	2
24	Lumber	1,006	2,499	1,748	751
25	Furniture	282	632	605	27
26	Paper	507	3,128	3,062	66
27	Printing	231	478	445	33
28	Chemicals	3,618	20,355	17,041	3,314
29	Petroleum	542	4,299	3,952	347
30	Plastics	1,822	3,909	3,387	522
31	Leather	60	149	140	9
32	Stone/Clay/Glass	1,027	2,800	2,516	284
33	Primary Metals	1,941	7,445	6,739	706
34	Fabricated Metals	2,959	8,089	7,238	851
35	Machinery	1,143	2,881	2,522	359
36	Electrical Equip.	1,831	3,883	3,735	148
37	Transportation Equip	1,348	4,872	4,526	346
38	Measure./Photo.	375	749	680	69
39	Miscellaneous	312	683	600	83
--	Multiple codes 20-39	1,317	4,869	4,412	457
--	No codes 20-39	348	887	802	85
491/493	Electric Utilities	732	6,634	6,458	176
5169	Chemical Wholesale Distributors	475	3,335	1,802	1,533
5171	Petroleum Bulk Terminals/Bulk Storage	596	4,779	4,135	644
7389/4953	Hazardous Waste/Solvent Recovery	223	2,762	2,721	41
	Total	**24,896**	**95,513**	**83,218**	**12,295**

Note: 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 2-2: TRI On-site and Off-site Releases by Industry, 2001

		On-site Releases							Off-site Releases	
				Underground Injection		On-site Land Releases				
SIC Code	Industry	Total Air Emissions Pounds	Surface Water Discharges Pounds	Class I Wells Pounds	Class II-V Wells Pounds	RCRA Subtitle C Landfills Pounds	Other On-site Land Releases Pounds	Total On-site Releases Pounds	Transfers Off-site to Disposal Pounds	Total On- and Off-site Releases Pounds
10	Metal Mining	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	768,762	760,047	14,387	149,109	0	14,414,576	16,106,880	10,830	16,117,710
20	Food	56,136,054	55,154,841	56,231	677	254	7,553,308	118,901,365	6,161,820	125,063,185
21	Tobacco	2,491,746	532,888	0	0	0	215,914	3,240,548	322,970	3,563,517
22	Textiles	5,740,423	175,447	0	0	0	295,953	6,211,823	749,261	6,961,084
23	Apparel	343,274	5	0	0	0	85	343,364	57,862	401,226
24	Lumber	30,478,706	19,931	0	0	4,092	394,721	30,897,450	518,539	31,415,989
25	Furniture	7,823,922	557	0	0	0	32	7,824,511	184,300	8,008,810
26	Paper	157,150,488	16,536,395	0	0	31,330	16,168,805	189,887,018	5,767,146	195,654,165
27	Printing	19,290,560	305	0	0	0	4,531	19,295,396	424,007	19,719,402
28	Chemicals	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	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	77,101,109	71,092	0	0	72,149	841,059	78,085,410	10,450,023	88,535,433
31	Leather	1,207,544	124,727	0	0	0	8,596	1,340,867	1,273,813	2,614,681
32	Stone/Clay/Glass	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	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	40,447,264	1,743,317	1	2,172	110,340	511,183	42,814,277	21,204,117	64,018,394
35	Machinery	8,279,835	18,063	0	0	56,873	2,394,310	10,749,081	4,610,570	15,359,651
36	Electrical Equip	12,721,139	2,936,994	0	0	19,017	681,803	16,358,954	7,575,105	23,934,059
37	Transportation Equip	66,691,884	198,256	750	0	45,805	727,692	67,664,387	12,965,556	80,629,943
38	Measure /Photo.	7,166,923	1,424,454	0	0	301	13,009	8,604,688	770,558	9,375,245
39	Miscellaneous	6,764,766	36,566	0	0	14,102	1,865	6,817,299	1,616,458	8,433,757
--	Multiple codes 20-39	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	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	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	1,254,310	1,856	5	0	5	1,074	1,257,250	211,020	1,468,270
5171	Petroleum Bulk Terminals/Bulk Stor	21,164,969	11,177	0	100	26	11,215	21,187,488	153,163	21,340,651
7389/4953	Hazardous Waste/Solvent Recov	974,414	23,498	22,678,278	0	129,266,508	15,482,910	168,425,606	51,446,405	219,872,011
	Total	**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 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

releases reported by electric utilities in 2001 were in these three states. Facilities in four other states, Indiana, West Virginia, Florida and Georgia, reported about 60 million pounds each.

Chemical manufacturing facilities in Texas reported one-quarter (146.4 million pounds) of total releases by this industry sector in 2001. Louisiana facilities reported the next largest amount, 75.2 million pounds or 12.9 percent of total releases by the chemical manufacturing sector. Primary metals facilities in Indiana and Pennsylvania reported the largest releases by this sector, with over 85 million pounds in each state. These two states accounted for almost one-third (32.3 percent) of all releases reported by the primary metals industry in 2001.

Starting in 1998, hazardous waste treatment and disposal facilities in SIC code 4953 were required to report to TRI. These facilities manage toxic chemicals in waste sent to them by other facilities. TRI chemicals in waste may be sent by one TRI facility (which reports the amounts as transfers off-site to disposal) to another TRI facility (which reports the amounts as on-site releases). Box 2-4 shows how much of the off-site transfers to disposal were also reported as on-site releases in 2001.

Table 2-3: TRI Total Releases by State by Industry, 2001

	Total On- and Off-site Releases							
State	Metal Mining	Coal Mining	Food	Tobacco	Textiles	Apparel	Lumber	Furniture
Alabama	0	233,705	3,103,521	0	72,286	0	876,364	488,517
Alaska	519,155,035	0	14,509	0	0	0	0	0
American Samoa	0	0	6,920	0	0	0	0	0
Arizona	543,252,773	0	28,022	0	0	0	60,085	13,199
Arkansas	0	0	2,664,168	0	153,593	0	769,862	273,257
California	1,447,448	0	4,390,038	0	70,348	0	720,196	155,158
Colorado	17,783,257	2,405,097	3,356,116	0	0	0	66,802	22,853
Connecticut	0	0	25,054	0	103,376	0	2,003	43,065
Delaware	1,396	0	347,828	0	0	0	0	12,714
District of Columbia	0	0	0	0	0	0	0	0
Florida	0	0	5,267,159	8,604	1,179	0	154,467	112,309
Georgia	0	0	1,997,711	151,495	338,341	0	1,914,980	238,843
Guam	0	0	0	0	0	0	0	0
Hawaii	0	0	30,369	0	0	0	0	0
Idaho	21,212,485	0	6,509,413	0	0	0	27,239	93,821
Illinois	262,294	3,244,133	11,560,047	22,132	44,557	0	117,310	215,319
Indiana	0	825,371	3,923,608	0	0	0	1,599,969	570,030
Iowa	0	0	7,852,717	0	0	0	564,692	301,049
Kansas	0	0	2,335,471	0	0	0	291,447	25,701
Kentucky	0	160,207	981,894	14,680	2,481	5	268,747	150,599
Louisiana	0	0	1,850,327	0	0	0	809,230	2,516
Maine	0	0	2,740,030	0	0	0	268,782	0
Maryland	0	184,432	269,233	0	85,952	0	19,251	0
Massachusetts	0	0	877	0	392,057	75	1,516	41,155
Michigan	0	0	1,110,187	0	17,732	42,400	1,340,354	523,007
Minnesota	0	0	3,057,135	0	5,945	0	1,286,114	55,613
Mississippi	0	0	7,146,452	0	283,903	0	2,861,482	188,166
Missouri	41,937,630	0	2,631,800	0	121	0	41,902	26,183
Montana	27,378,393	5	340,992	0	0	0	893,759	0
Nebraska	0	0	10,665,964	0	0	0	65,936	85,375
Nevada	773,433,984	0	255	0	0	0	2	0
New Hampshire	0	0	0	0	40,278	18,456	0	0
New Jersey	0	0	99,061	0	69,870	38,562	17,971	0
New Mexico	95,554,881	4,743,135	135,361	0	0	0	0	0
New York	29,557	0	3,467,972	0	12,959	0	217,243	96,532
North Carolina	0	0	9,288,592	1,049,969	1,863,413	29,564	2,768,852	1,933,191
North Dakota	0	1,166,089	869,270	0	0	0	0	0
Northern Marianas	0	0	0	0	0	0	0	0
Ohio	0	19,332	4,917,117	0	1,011,945	128,084	406,026	204,547
Oklahoma	0	0	2,232,939	0	6,465	0	188,465	0
Oregon	0	0	868,840	0	500	0	2,653,733	80,407
Pennsylvania	0	525,838	2,906,765	15,212	91,571	8,744	1,746,538	141,064
Puerto Rico	0	0	26,552	981	0	0	0	0
Rhode Island	0	0	0	0	187,910	0	2,723	10,337
South Carolina	0	0	2,127,568	0	772,267	0	1,359,171	164,159
South Dakota	6,327,907	0	2,870,380	0	0	0	73,904	0
Tennessee	30,949,179	0	1,907,199	4,790	532,654	0	412,321	411,993
Texas	50,005	0	3,074,047	0	8,508	62,362	2,247,249	10,255
Utah	703,578,972	24	385,667	0	0	0	11,919	42,967
Vermont	0	0	86,012	0	0	0	7,687	19
Virgin Islands	0	0	0	0	0	0	0	0
Virginia	0	0	2,339,004	2,288,880	316,585	0	1,160,204	939,398
Washington	199,060	0	176,390	0	48,750	0	248,636	1,953
West Virginia	0	2,609,789	141,494	6,774	0	0	1,471,348	0
Wisconsin	0	0	2,774,641	0	425,538	72,974	1,399,373	333,539
Wyoming	0	553	160,495	0	0	0	136	0
Total	**2,782,554,257**	**16,117,710**	**125,063,185**	**3,563,517**	**6,961,084**	**401,226**	**31,415,989**	**8,008,810**

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

Facilities/forms are included in the 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 2-3: TRI Total Releases by State by Industry, 2001, *continued*

State	Total On- and Off-site Releases						
	Paper	Printing	Chemicals	Petroleum	Plastics	Leather	Stone/Clay/ Glass
Alabama	15,639,588	2,638	23,225,886	491,241	1,323,452	0	2,243,810
Alaska	0	0	1,507,766	134,256	0	0	0
American Samoa	0	0	0	0	0	0	0
Arizona	347,807	0	118,817	5,801	590,345	0	263,574
Arkansas	6,281,139	36,755	6,159,082	1,036,525	3,067,173	20,921	1,052,653
California	1,536,402	44,185	2,393,826	9,289,942	2,206,286	79,940	1,428,625
Colorado	0	0	164,246	170,859	247,503	0	192,444
Connecticut	25,053	25,114	1,036,059	251	715,423	0	20,632
Delaware	11,846	0	4,599,624	1,655,868	78,026	0	250
District of Columbia	0	0	0	0	0	0	984
Florida	13,117,190	12,566	30,859,507	8,028	3,059,628	18,450	675,625
Georgia	17,966,352	1,053,636	9,905,072	31,661	3,159,441	0	2,115,726
Guam	0	0	0	0	0	0	0
Hawaii	0	0	0	40,476	0	0	0
Idaho	17,960	0	3,573,081	0	54,084	0	29
Illinois	553,327	2,007,906	15,913,032	5,108,723	6,404,338	182,105	954,164
Indiana	1,040,454	675,874	6,387,108	1,118,554	8,771,549	0	1,127,811
Iowa	101,379	153,408	4,737,302	4,130	1,220,901	162,186	370,652
Kansas	1,222,781	13,455	9,234,480	920,072	491,864	0	1,523,947
Kentucky	3,252,903	1,473,854	11,831,988	442,091	2,466,860	13,428	1,211,141
Louisiana	19,922,421	0	75,237,938	9,718,360	473,756	0	22,001
Maine	6,533,660	50,205	4,145	0	26,185	282,351	1,009
Maryland	1,793,517	51,025	7,291,793	1,398	461,209	284,815	304,085
Massachusetts	451,472	18,905	1,212,438	89	549,485	44,385	9,998
Michigan	3,661,226	60,714	5,553,471	165,053	1,976,797	407,963	3,383,592
Minnesota	1,601,597	36,997	422,427	1,362,182	841,502	223,580	86,884
Mississippi	6,632,807	1,444,375	28,824,282	684,018	1,701,808	0	538,849
Missouri	5,957	12,967	10,856,479	42,453	1,278,505	226,033	1,305,425
Montana	1,508,089	0	92,244	474,340	0	0	26,078
Nebraska	0	25,918	598,536	0	1,020,694	0	272,850
Nevada	0	276,051	2,536,457	12,075	133,250	0	5,005
New Hampshire	160,518	0	57,537	0	582,871	28,319	1,483
New Jersey	664,282	172,645	39,730,451	3,134,036	326,969	124,758	299,690
New Mexico	0	0	30,090	341,924	8,671	0	6,588
New York	2,261,518	391,916	3,758,008	41,635	824,224	46,328	1,176,368
North Carolina	13,402,526	133,348	11,083,080	1,918	3,545,843	0	1,754,024
North Dakota	0	0	127,175	1,907,280	52,756	0	0
Northern Marianas	0	0	0	0	0	0	0
Ohio	3,550,963	125,697	31,550,890	837,395	6,269,181	0	5,707,782
Oklahoma	4,412,691	15,545	7,449,647	1,037,634	1,027,343	0	355,398
Oregon	6,006,533	795	1,204,249	52,168	573,400	0	79,666
Pennsylvania	6,944,063	1,207,239	4,252,276	3,367,264	4,001,712	184,235	2,687,863
Puerto Rico	0	0	3,890,818	376,044	117,972	18,270	1,782
Rhode Island	112,168	0	62,511	0	67,974	0	34,375
South Carolina	12,684,887	474,963	10,038,296	816	4,991,157	0	1,259,333
South Dakota	0	0	1,096	0	98,738	0	74,657
Tennessee	6,442,292	5,745,551	31,613,691	144,452	13,337,218	0	262,795
Texas	5,818,665	217,952	146,418,936	22,222,531	4,629,193	101,809	5,571,459
Utah	0	42	627,627	443,384	166,406	0	187,225
Vermont	35,024	0	33,730	0	25,087	0	8,200
Virgin Islands	0	0	0	1,035,459	0	0	0
Virginia	12,644,520	3,128,360	10,215,074	796,554	3,708,748	0	1,197,494
Washington	6,390,450	15,740	318,282	2,372,515	811,703	0	173,825
West Virginia	0	13,025	8,545,468	117,217	308,156	0	192,025
Wisconsin	10,898,141	600,035	615,963	9,994	740,047	164,804	226,654
Wyoming	0	0	6,682,833	225,648	0	0	64,145
Total	**195,654,165**	**19,719,402**	**582,584,818**	**71,384,317**	**88,535,433**	**2,614,681**	**40,460,674**

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

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Table 2-3: TRI Total Releases by State by Industry, 2001, *continued*

State	Total On- and Off-site Releases						
	Primary Metals	Fabricated Metals	Machinery	Electrical Equip.	Transportation Equip.	Measure./Photo.	Miscellaneous
Alabama	18,188,820	1,655,660	161,303	782,248	1,692,482	388	48,446
Alaska	0	0	0	0	0	0	0
American Samoa	0	0	0	0	0	0	0
Arizona	52,441,773	366,538	3,532	213,765	285,423	6,666	151,864
Arkansas	14,892,368	943,593	215,134	1,312,154	719,943	30,156	1,851
California	837,109	1,896,039	35,588	487,191	1,689,807	95,650	1,060,641
Colorado	216,413	720,128	19,619	70,095	252,400	437,161	750
Connecticut	461,111	901,880	201,356	185,249	151,765	161,372	13,897
Delaware	27,939	1,568	0	227	753,407	754	2,282
District of Columbia	0	0	0	0	0	0	0
Florida	526,280	959,031	34,928	122,506	3,720,212	169,108	148,231
Georgia	409,145	1,211,204	531,518	757,603	4,043,789	33,617	90,773
Guam	0	0	0	0	0	0	0
Hawaii	0	85,921	0	0	0	0	0
Idaho	153,570	29,204	99	64,891	96,891	0	0
Illinois	21,617,722	4,989,589	2,794,203	801,516	2,031,293	66,863	251,633
Indiana	94,148,993	3,311,791	540,487	1,163,279	7,431,246	290,262	1,043,333
Iowa	2,356,093	992,510	787,866	1,341,569	489,565	250	225,366
Kansas	1,425,717	544,262	256,341	250,330	1,613,551	378,542	163,824
Kentucky	7,396,084	1,054,365	144,444	415,258	9,686,678	0	169,732
Louisiana	1,689,452	717,796	91,934	63,321	588,209	53,009	0
Maine	0	30,040	10,637	36,899	396,112	41	4,858
Maryland	1,354,813	513,238	25,043	10,736	557,173	255,984	4
Massachusetts	389,674	686,461	40,870	113,502	17,933	171,735	419,636
Michigan	34,000,035	1,718,722	714,642	275,550	10,066,098	30,750	402,362
Minnesota	4,200,263	1,859,322	323,049	1,003,193	1,374,220	340,024	41,962
Mississippi	696,023	1,440,565	254,462	1,127,112	629,138	21,686	247,993
Missouri	30,930,004	1,697,978	547,527	998,303	6,081,422	23,736	135,993
Montana	22,114,808	0	0	0	0	14,519	37,864
Nebraska	475,216	378,620	387,753	20,961	450,159	326,902	2
Nevada	77,872	88,514	16,819	0	3,306	1	0
New Hampshire	77,176	64,885	17,750	105,962	33,723	1,781	16,790
New Jersey	3,226,801	680,273	49,625	42,064	794,035	10,552	10,748
New Mexico	17,888	29,509	0	125,271	18,768	10,070	0
New York	2,564,003	1,365,536	215,191	2,428,518	127,490	5,109,107	297,078
North Carolina	2,978,644	2,232,927	230,759	733,262	3,040,997	123,602	46,707
North Dakota	1	520	196,007	0	34,911	0	36,806
Northern Marianas	0	0	0	0	0	0	0
Ohio	43,119,667	6,547,648	932,404	2,386,286	5,366,141	496,334	202,125
Oklahoma	1,668,767	1,266,759	305,191	75,992	559,462	0	18,993
Oregon	4,532,409	180,486	11,931	1,033,792	526,059	8,593	0
Pennsylvania	86,118,527	4,435,754	1,511,113	491,067	1,888,818	76,176	1,236,047
Puerto Rico	4,406	289,970	14,120	69,313	3,745	51,619	119,508
Rhode Island	142,688	103,564	2	59,174	80,120	2,360	13,579
South Carolina	16,268,293	1,128,427	1,055,729	1,045,677	1,057,363	332,756	445,312
South Dakota	139,610	55,245	171,139	1,359	68,582	770	21,440
Tennessee	5,797,291	2,711,898	565,510	1,205,102	4,606,041	31,552	520,366
Texas	17,670,994	5,022,158	769,321	629,940	1,953,125	11,388	185,675
Utah	46,905,481	88,261	7,396	157,393	923,784	152,924	18,619
Vermont	4,729	15,308	1,532	122,846	1,758	0	0
Virgin Islands	0	0	0	0	0	0	0
Virginia	5,328,428	2,443,274	131,694	281,316	1,971,701	3,224	338,293
Washington	1,302,890	1,525,711	21,337	57,908	1,026,701	114	82
West Virginia	2,880,800	806,531	8,916	12,880	299	21,773	10,820
Wisconsin	6,806,290	4,087,958	1,003,562	1,251,478	1,724,098	21,377	231,473
Wyoming	5,595	141,255	271	0	0	0	0
Total	**558,588,679**	**64,018,394**	**15,359,651**	**23,934,059**	**80,629,943**	**9,375,245**	**8,433,757**

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

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Table 2-3: TRI Total Releases by State by Industry, 2001, *continued*

State	Total On- and Off-site Releases						
	Multiple codes 20-39	No codes 20-39	Electric Utilities	Chemical Wholesale Distributors	Petroleum Bulk Terminals/Bulk Storage	Hazardous Waste/Solvent Recovery	Total
Alabama	6,765,996	92,790	50,155,499	25,856	47,164	7,127,918	134,445,577
Alaska	0	748,479	485,096	2,147	25,443	0	522,072,731
American Samoa	0	0	0	0	0	0	6,920
Arizona	133,796	193,613	8,249,462	12,561	67,808	7,099	606,814,321
Arkansas	847,623	1,317	3,214,474	869	15,289	332,666	44,042,566
California	1,920,906	1,370,111	634,510	56,831	345,243	24,357,423	58,549,443
Colorado	291,738	349,080	10,165,860	3,996	65,069	44,928	37,046,413
Connecticut	1,195,590	5,220	2,623,711	5,576	89,162	1,763,375	9,755,293
Delaware	33,896	2,958	4,543,780	0	0	0	12,074,363
District of Columbia	965	17,890	40,734	0	0	0	60,573
Florida	1,270,690	393,913	62,345,582	75,986	140,197	564	123,201,939
Georgia	9,842,858	667,801	59,991,727	27,272	31,588	7,489	116,519,643
Guam	16	5,419	167,189	0	25,859	0	198,483
Hawaii	212,153	568,136	2,051,328	20	78,135	0	3,066,537
Idaho	8,401,304	1,537,490	0	1,300	58,113	33,350,894	75,181,868
Illinois	9,439,338	148,389	26,389,807	80,680	177,284	22,371,306	137,749,010
Indiana	2,199,493	504,143	60,202,833	32,495	55,596	8,593,503	205,557,782
Iowa	5,841,477	9,721	10,344,358	16,284	0	5	37,873,480
Kansas	1,876,497	163,884	8,757,189	17,620	29,706	129,907	31,666,590
Kentucky	769,957	460,401	50,996,018	29,281	29,105	273,453	93,695,654
Louisiana	2,935,253	605,702	5,711,765	35,669	17,944,644	7,347,599	145,820,901
Maine	152,118	4,114	134,015	42	37,443	0	10,712,685
Maryland	324,730	131,309	31,443,739	0	60,724	7	45,424,212
Massachusetts	429,615	1,455	5,727,725	21,475	161,148	182,050	11,085,729
Michigan	1,900,710	0	43,638,702	26,617	52,459	20,847,649	131,916,793
Minnesota	1,806,131	74,761	12,055,672	10,547	1,687	1,324,502	33,395,310
Mississippi	5,071,223	27,669	11,252,563	3,561	8,157	6	71,086,301
Missouri	2,080,910	173,708	18,750,745	47,130	56,255	531	119,889,698
Montana	0	0	12,497,345	2,786	6,956	0	65,388,178
Nebraska	1,507,435	375,447	9,443,199	14	0	568,436	26,669,417
Nevada	0	297,073	2,617,308	255	3,033	3,993,368	783,494,630
New Hampshire	147,453	0	3,377,682	357	25,631	0	4,758,653
New Jersey	205,280	82,970	7,331,756	239,295	276,785	1,213,297	58,841,777
New Mexico	0	199,453	4,590,509	4,545	11,438	5,048	105,833,149
New York	804,501	213,711	19,063,695	14,864	302,734	361	44,831,050
North Carolina	1,631,668	606,722	88,669,969	112,175	31,845	374,500	147,668,098
North Dakota	0	0	20,885,046	1,193	0	0	25,277,053
Northern Marianas	6	0	0	0	7,949	0	7,955
Ohio	3,239,503	112,489	87,321,564	141,423	75,138	49,893,950	254,563,632
Oklahoma	936,742	533,753	4,183,555	20,226	47,113	2,544,341	28,887,021
Oregon	1,473,838	0	555,850	13,936	35,723	17,683,609	37,576,517
Pennsylvania	4,336,127	82,247	76,428,642	52,203	124,950	2,621,987	207,484,044
Puerto Rico	108,779	8,919	10,412,765	3,690	25,732	61,614	15,606,599
Rhode Island	117,182	18	47,075	250	53,581	510	1,098,100
South Carolina	4,702,803	229,680	21,062,566	28,448	7,959	23,283	81,260,912
South Dakota	265,724	110,857	3,245,844	0	0	0	13,527,252
Tennessee	5,567,167	118,732	35,754,762	26,891	28,478	263,298	148,961,221
Texas	3,866,541	1,055,529	41,955,932	227,833	490,790	6,262,878	270,535,075
Utah	172,987	428,843	7,025,676	5,831	9,124	5,857,174	767,197,725
Vermont	21,071	0	0	0	0	0	363,002
Virgin Islands	0	0	1,374	0	1,785	0	1,038,618
Virginia	5,932,042	313,411	24,169,323	18,960	112,462	4,903	79,783,853
Washington	2,613,135	667,515	5,454,864	4,319	41,085	419,309	23,892,274
West Virginia	9,612	3,312	62,974,197	1,211	4,351	9	80,140,007
Wisconsin	521,732	63,406	12,791,961	13,751	12,476	17,261	46,808,527
Wyoming	0	0	10,310,740	0	255	0	17,591,926
Total	**103,926,308**	**13,763,561**	**1,062,247,281**	**1,468,270**	**21,340,651**	**219,872,011**	**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 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

Box 2-4: Duplication of Off-site Transfers to Disposal, 2001

TRI facilities may transfer off-site chemicals in waste to other facilities for disposal. Box 1-8 in Chapter 1 explains the analysis done to avoid counting transfers by one TRI facility that are also reported as on-site releases by another facility. The off-site transfers to disposal are omitted from tables that compare or summarize on-site and off-site releases for all industries. Only the on-site releases from the other TRI facilities are included in such analyses.

The following shows the results of the analysis for 2001 and how much is omitted from tables that present total releases.

Off-site Transfer M Code	Total Transfers to Disposal	Transfers to Disposal for Matching RCRA ID	Transfers Omitted Because Duplicated in Section 5 of Recipient TRI Facility	Section 5 Checked for Recipient TRI Facilities Based on Matching Chemical or, if Metal, Metal plus Metal Category Compound
	Pounds	Pounds	Pounds	
M10	6,121,927	1,623,985	0	5.5.4
M41*	189,119,202	171,707,610	65,655,120	5.5.1 A and B
M62*	7,062,658	5,288,177	3,294,044	5.5.1 A and B, 5.5.3 and 5.3
M71	23,628,466	19,214,109	7,490,783	5.4
M72	376,463,505	44,992,192	11,750,863	5.5.1 A and B, 5.5.3
M73	7,312,782	262,675	49,052	5.5.2
M79	22,370,055	6,157,888	78,990	5.5.4
M90	15,946,259	2,184,036	339,599	All Section 5
M99	4,298,166	2,636,653	169,248	All Section 5
Total	**652,323,020**	**254,067,324**	**88,827,700**	
Number of Form Rs	83,218	9,439	3,359	

* Includes metals and metal compounds reported under codes M40 and M61.

Waste Management Data, 2001

Quantities of TRI Chemicals in Waste

TRI facilities reported managing a total of 26.74 billion pounds of toxic chemicals in production-related waste in 2001, as shown in Table 2-4. Figure 2-2 shows percentages of the total quantities of toxic chemicals in production-related waste reported by the industries with the largest totals.

On-site recycling was the most common management method, accounting for 7.56 billion pounds of toxic chemicals in production-related waste managed in 2001. On-site treatment was the second most-common method, accounting for 6.93 billion pounds of toxic chemicals in production-related waste. Together, these two methods constituted more than half (54.2 percent) of the quantity of toxic chemicals in production-related waste managed. On- and off-site releases accounted for 6.18 billion pounds, almost one-quarter (23.1 percent) of the toxic chemicals managed in waste.

The chemical manufacturing industry reported managing 10.69 billion pounds of toxic chemicals in production-related waste, 40.0 percent of the total in 2001. The chemical manufacturing industry also reported the largest quantities of toxic chemicals in waste managed in on-site recycling, energy recovery and treatment as well as off-site energy recovery and treatment. Over 55 percent (4.16 billion pounds) of toxic chemicals recycled on-site was reported by the chemical manufacturing industry.

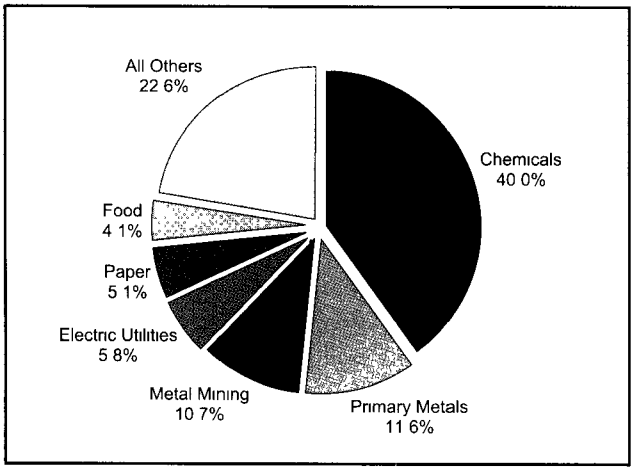
Table 2-4: Quantities of TRI Chemicals in Waste by Industry, 2001

SIC Code	Industry	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Releases On- and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-production-related Waste Managed 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 Stor	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 Recov	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

Figure 2-2: TRI Total Production-related Waste Managed by Industry, 2001



Note: Data are from Section 8 of Form R

On-site treatment, the chemical industry's second most common waste management method, accounted for 52.8 percent (3.66 billion pounds) of all on-site treatment. On-site energy recovery totaled 1.36 billion pounds, or 51.3 percent of all such waste managed. The chemical manufacturing industry reported the third largest amount of toxic chemicals released on- and off-site, with 586.7 million pounds released on- and off-site in 2001.

The primary metals industry ranked second for toxic chemicals in production-related waste managed in 2001, with 3.10 billion pounds. On-site recycling accounted for 1.34 billion pounds, or 17.8 percent of the total recycled on-site—second to the chemical manufacturing industry in this waste management category. The primary metals industry reported the largest quantity of off-site recycling

(676.0 million pounds or 34.3 percent of total off-site releases).

The metal mining industry reported the third-largest quantity of toxic chemicals of production-related waste managed, 2.87 billion pounds. Nearly 97 percent of this amount (2.78 billion pounds) was released on- and off-site, the largest quantity for on- and off-site releases for all industries in 2001 and accounting for 45.0 percent of total releases by all industries.

One other industry group exceeded 1.5 billion pounds in toxic chemicals in production-related waste: electric utilities, which reported a total of 1.56 billion pounds. Of that total, 68.0 percent (1.06 billion pounds) was released on- and off-site. This represented the second-largest quantity released on- and off-site by any industry group and was 17.2 percent of the total quantity released on- and off-site in 2001.

Transfers Off-site for Further Waste Management, including Disposal

As shown in Table 2-5, a total of 4.08 billion pounds of TRI chemicals was transferred in waste for further waste management, including disposal, in 2001. The primary metals industry accounted for 25.3 percent (1.03 billion pounds) of the combined total transfers of toxic chemicals for all industries. Within the primary metals industry, 65.0 percent (670.3 million pounds) of TRI transfers came from transfers to recycling, while other transfers off-site to disposal accounted for 32.6 percent (336.5 million pounds) of the industry's total.

Chemical manufacturing accounted for the next highest share—24.7 percent (1.01 billion pounds)—

Table 2-5: TRI Transfers Off-site for Further Waste Management, including Disposal, by Industry, 2001

SIC Code	Industry	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs: Metals and Metal Category Compounds Pounds	Transfers to POTWs: Non-metal TRI Chemicals Pounds	Other Off-site Transfers* Pounds	Other Off-site Transfers to Disposal** Pounds	Total Transfers for Further Waste Management, including Disposal Pounds
10	Metal Mining	1,212,654	30	4,862	7,226	29,250	0	520,637	1,774,658
12	Coal Mining	7,985	0	0	0	0	0	10,830	18,815
20	Food	2,861,325	227,739	2,812,424	14,952	33,738,110	1,282	6,154,141	45,809,973
21	Tobacco	13,677	28,433	183,927	0	378,039	0	322,970	927,046
22	Textiles	1,108,952	2,031,127	152,464	133,026	1,278,160	0	616,962	5,320,692
23	Apparel	59,820	58,867	1,410	5	14,908	421	57,857	193,288
24	Lumber	900,965	5,117,146	759,504	565	240,337	34,150	562,171	7,614,837
25	Furniture	3,690,404	1,849,539	330,958	334	11,338	33,441	202,927	6,118,941
26	Paper	2,388,038	5,530,598	8,051,327	247,446	35,156,868	33	5,521,709	56,896,019
27	Printing	12,498,736	3,362,384	355,015	2,515	1,702,687	1,020	423,870	18,346,227
28	Chemicals	161,317,904	409,039,228	184,882,115	468,404	158,151,302	1,126,131	92,936,617	1,007,921,702
29	Petroleum	24,121,642	2,626,857	3,931,881	76,431	6,567,789	0	3,953,080	41,277,681
30	Plastics	13,284,573	7,367,768	2,037,190	57,241	6,447,740	58,777	10,427,821	39,681,111
31	Leather	195,414	19,712	23,694	279,543	592,054	0	994,270	2,104,687
32	Stone/Clay/Glass	4,661,760	1,718,870	1,308,857	52,676	2,778,697	948	5,745,652	16,267,460
33	Primary Metals	670,318,881	3,283,961	9,353,965	155,752	12,087,861	26,096	336,469,448	1,031,695,964
34	Fabricated Metals	335,240,964	11,388,884	4,350,455	289,417	17,444,620	17,775	22,311,755	391,043,870
35	Machinery	94,039,764	1,549,178	987,483	27,050	2,046,332	3,931	4,705,311	103,359,048
36	Electrical Equip.	285,928,713	7,547,140	3,149,594	80,409	20,167,528	13,552	8,224,514	325,111,451
37	Transportation Equip	113,844,624	10,706,228	3,180,375	140,452	10,297,737	281,776	13,248,516	151,699,708
38	Measure /Photo.	10,577,208	1,822,251	1,627,394	5,582	510,065	9,444	813,302	15,365,246
39	Miscellaneous	12,463,660	1,353,671	1,055,567	5,407	1,483,005	77,000	1,659,987	18,098,297
--	Multiple codes 20-39	158,378,157	21,170,353	17,564,748	110,742	21,834,533	67,356	16,223,445	235,349,333
--	No codes 20-39	3,326,021	998,907	463,819	2,745	1,092,037	784	1,185,592	7,069,904
491/493	Electric Utilities	7,061,710	684	8,486	7,866	1,829	0	76,835,064	83,915,639
5169	Chemical Wholesale Distributors	83,062	15,221,036	5,584,784	19	42,094	0	215,648	21,146,642
5171	Petroleum Bulk Terminals/Bulk Storage	9,055,355	212,247	775,993	458	17,782	0	161,834	10,223,669
738/495	Hazardous Waste/Solvent Recovery	22,198,522	326,100,016	26,748,204	44,907	3,589,900	27,151	53,833,685	432,542,385
	Total	**1,950,840,492**	**840,332,852**	**279,686,495**	**2,211,172**	**337,702,602**	**1,781,068**	**664,339,613**	**4,076,894,294**

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

of the combined total for all industries. Of the chemical manufacturing industry's off-site transfers total, 40.6 percent (409.0 million pounds) came from transfers to energy recovery, 18.3 percent (184.9 million pounds) from transfers to treatment, and 16.0 percent (161.3 million pounds) from transfers to recycling.

The third-largest share of the total transfers off-site for further waste management, including disposal, came from the hazardous waste/solvent recycling industries, which had 10.6 percent (432.5 million pounds) of the overall total. Of the 432.5 million pounds, 75.4 percent (326.1 million pounds) came from transfers to energy recovery.

Of the 4.08 billion pounds of the toxic chemicals transferred off-site for further waste management, including disposal, 47.9 percent (1.95 billion pounds) was managed through transfers to recycling, 20.6 percent (840.3 million pounds) through transfers to energy recovery, and 16.3 percent (664.3 million pounds) through other off-site transfers to disposal. The primary metals industry accounted for 670.3 million pounds (34.4 percent) of the total pounds managed through transfers to recycling, fabricated metals for 335.2 million pounds (17.2 percent), and electrical equipment manufacturing for 285.9 million pounds (14.7 percent). In transfers to energy recovery, the second most-common management category, chemical manufacturing accounted for 409.0 million pounds (48.7 percent) and hazardous waste/solvent recovery industries for 326.1 million pounds (38.8 percent).

Projected Quantities of TRI Chemicals Managed in Waste, 2001-2003

As described in **Waste Management** in Chapter 1, on each Form R that it submits, a facility reports actual quantities of the toxic chemicals managed in waste for the current and prior year amounts and projected quantities for the next two years. Table 2-6 outlines the actual current and prior year amounts and projected quantities of TRI chemicals in waste.

In 2001, a total of 25.50 billion pounds was reported. This represented a decrease of 8.2 percent from 2000.[1]

The projected totals were for 24.95 billion pounds for 2002 and 25.34 billion pounds for 2003. These projections represented a 2.2 percent decrease from 2001 to 2002 and a 1.6 percent increase from 2002 to 2003, or a net decrease of less than one percent from 2001 to 2003.

The largest net decrease from 2001 to 2003 was projected to come from the metal mining industry, which expected a decrease of 213.6 million pounds or 8.4 percent. The second largest net decrease (114.1 million pounds or 12.2 percent) was projected by the hazardous waste/solvent recovery industries. From 2000 to 2001, the chemical manufacturing industry had the largest decrease (1.70 billion pounds or 13.7 percent).

These decreases offset projected increases in the stone/clay/glass industry, which expected an increase of 128.2 million pounds or 22.6 percent, and in the fabricated metals industry, which expected an increase of 45.2 million pounds (7.0 percent) from 2001 to 2003. These projected increases came after decreases of 78.0 million pounds (12.1 percent) by the stone/clay/glass industry and 32.2 million pounds (4.7 percent) by the fabricated metals industry from 2000 to 2001.

Source Reduction, 2001

In 2001, TRI industries submitted 83,218 Form R's, 22.0 percent (18,340) of which reported source reduction activities (see Table 2-7). As noted in **Waste Management** in Chapter 1, source reduction—an activity that prevents the generation of waste—is preferred to waste management.

The furniture industry had the highest ratio of forms reporting source reduction activity (53.1 percent), followed by the leather industry (40.0 percent), and the measurement/photographic industry (35.1 percent). The industries with the lowest ratios

[1] The reporting thresholds for lead and lead compounds were lowered for 2001. The amounts reported for these chemicals have been omitted from this table because 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 2-6: Prior Year, Current Year and Projected Quantities of TRI Chemicals in Waste by Industry, 2000-2003

SIC Code	Industry	Total Production-related Waste Managed				Change 2000-2001	Projected Change 2001-2002	Projected Change 2002-2003	Projected Change 2001-2003
		Prior Year 2000 Pounds	Current Year 2001 Pounds	Projected 2002 Pounds	Projected 2003 Pounds	Percent	Percent	Percent	Percent
10	Metal Mining	2,502,718,456	2,534,067,408	2,228,111,923	2,320,464,693	1 3	-12 1	4 1	-8 4
12	Coal Mining	15,572,922	15,245,126	14,666,760	13,673,156	-2 1	-3 8	-6 8	-10 3
20	Food	573,657,057	1,090,021,161	1,072,402,491	1,109,278,307	90 0	-1 6	3 4	1 8
21	Tobacco	5,318,793	5,302,516	4,740,500	4,796,458	-0 3	-10 6	1 2	-9 5
22	Textiles	43,699,669	40,681,466	40,309,030	40,701,561	-6 9	-0 9	1 0	0 0
23	Apparel	2,000,866	1,803,385	1,814,487	1,813,026	-9 9	0 6	-0 1	0 5
24	Lumber	183,728,064	69,085,194	70,471,196	71,034,142	-62 4	2 0	0 8	2 8
25	Furniture	18,244,887	14,997,035	13,901,334	12,871,398	-17 8	-7 3	-7 4	-14 2
26	Paper	1,371,162,995	1,373,899,889	1,397,295,714	1,396,720,140	0 2	1 7	0 0	1 7
27	Printing	371,054,534	370,480,920	391,250,061	397,642,259	-0 2	5 6	1 6	7 3
28	Chemicals	12,380,867,203	10,679,613,005	10,683,087,381	10,673,327,326	-13 7	0 0	-0 1	-0 1
29	Petroleum	848,089,471	878,433,051	864,633,581	845,853,308	3 6	-1 6	-2 2	-3 7
30	Plastics	216,740,969	204,339,414	194,140,205	198,886,460	-5 7	-5 0	2 4	-2 7
31	Leather	17,230,895	8,407,158	8,307,619	8,232,553	-51 2	-1 2	-0 9	-2 1
32	Stone/Clay/Glass	645,298,634	567,336,466	594,177,395	695,489,337	-12 1	4 7	17 1	22 6
33	Primary Metals	3,323,082,431	2,658,357,555	2,570,961,112	2,689,424,260	-20 0	-3 3	4 6	1 2
34	Fabricated Metals	680,535,574	648,366,435	665,389,887	693,538,592	-4 7	2 6	4 2	7 0
35	Machinery	126,409,571	127,310,768	110,752,012	100,256,319	0 7	-13 0	-9 5	-21 3
36	Electrical Equip	397,401,207	314,410,782	285,048,035	290,383,071	-20 9	-9 3	1 9	-7 6
37	Transportation Equip	272,554,231	253,110,688	244,127,218	247,002,448	-7 1	-3 5	1 2	-2 4
38	Measure/Photo	71,123,896	61,995,124	64,538,066	64,701,768	-12 8	4 1	0 3	4 4
39	Miscellaneous	42,303,705	40,655,195	36,923,836	37,792,135	-3 9	-9 2	2 4	-7 0
--	Multiple codes 20-39	990,565,000	947,713,219	941,167,449	944,025,325	-4 3	-0 7	0 3	-0 4
--	No codes 20-39	21,135,108	24,095,792	20,416,225	26,778,068	14 0	-15 3	31 2	11 1
491/493	Electric Utilities	1,667,907,225	1,552,455,699	1,529,972,427	1,533,101,833	-6 9	-1 4	0 2	-1 2
5169	Chemical Wholesale Distributors	52,373,277	41,070,757	50,018,802	50,795,130	-21 6	21 8	1 6	23 7
5171	Petroleum Terminals/Bulk Storage	39,237,419	46,271,156	52,522,129	52,815,101	17 9	13 5	0 6	14 1
7389/4953	Hazardous Waste/Solvent Recovery	900,755,445	932,484,480	799,822,740	818,519,767	3 5	-14 2	2 3	-12 2
	Total	**27,780,769,507**	**25,502,010,846**	**24,950,969,614**	**25,339,917,942**	**-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

of reported source reduction activities were coal mining (no forms), metal mining (3.0 percent), apparel (5.1 percent), and electric utilities (7.1 percent).

Good operating practices accounted for the largest number (6,474) of source reduction activities reported. Process modifications accounted for the next largest number (3,719) while spill and leak prevention accounted for the third (2,887). The chemical manufacturing industry had the highest number of reported source reductions in every category but two—cleaning and degreasing (where fabricated metals did), and surface preparation and finishing (where transportation equipment did)—mainly because it submitted over one-fifth (20.5 percent) of the total Form R's.

TRI DATA FOR 2000-2001

Comparisons of TRI data across reporting years are made on the basis of chemicals that were reportable in all years with the same reporting definitions. This ensures that apparent increases or decreases from one year to another are not the result of changes in the list of TRI chemicals. **Making Year-to-Year Comparisons of TRI Data**, in Chapter 1, explains the issues involved in making multi-year analyses. An understanding of these year to year changes is essential for accurate interpretation of the multi-year data presented in this chapter. Comparisons of releases and other waste management data for the years from 2000 to 2001 do not include lead and lead compounds because lower reporting thresholds for these chemicals only became effective with the 2001 reporting year. Comparisons for the years 1998-2001 do not include PBT chemicals, vanadium and vanadium compounds because reporting requirements

Table 2-7: Number of Forms Reporting Source Reduction Activity, by Category and Industry, 2001

			Forms Reporting Source Reduction Activity		Category of Source Reduction Activity							
SIC Code	Industry	Total Form Rs Number	Number	Percent of All Form Rs Percent	Good Operating Practices Number	Inventory Control Number	Spill and Leak Prevention Number	Raw Materials Modifications Number	Process Modifications Number	Cleaning and Degreasing Number	Surface Preparation and Finishing Number	Product Modifications Number
10	Metal Mining	639	19	3 0	3	0	0	0	16	0	0	0
12	Coal Mining	285	0	0 0	0	0	0	0	0	0	0	0
20	Food	2,296	499	21 7	233	24	100	12	112	10	2	6
21	Tobacco	67	7	10 4	3	0	0	0	4	0	0	0
22	Textiles	626	121	19 3	33	13	12	20	23	7	8	5
23	Apparel	39	2	5 1	0	0	0	0	2	0	0	0
24	Lumber	1,748	491	28 1	120	4	68	60	96	14	110	19
25	Furniture	605	321	53 1	73	19	37	28	20	9	124	11
26	Paper	3,062	415	13 6	105	13	33	88	121	6	18	31
27	Printing	445	133	29 9	54	11	2	29	24	4	2	7
28	Chemicals	17,041	4,885	28 7	1,635	421	897	406	1,135	139	13	239
29	Petroleum	3,952	743	18 8	234	13	289	10	188	7	0	2
30	Plastics	3,387	1,016	30 0	306	56	79	187	182	21	126	59
31	Leather	140	56	40 0	12	6	5	16	5	3	8	1
32	Stone/Clay/Glass	2,516	499	19 8	133	57	79	73	115	4	23	15
33	Primary Metals	6,739	1,070	15 9	435	37	129	97	274	31	35	32
34	Fabricated Metals	7,238	1,803	24 9	682	168	155	146	304	148	146	54
35	Machinery	2,522	342	13 6	124	12	23	34	86	14	28	21
36	Electrical Equip	3,735	885	23 7	310	85	71	75	211	35	46	52
37	Transportation Equip	4,526	1,080	23 9	352	83	52	155	157	44	172	65
38	Measure/Photo	680	239	35 1	81	25	16	28	60	7	6	16
39	Miscellaneous	600	157	26 2	47	4	10	24	39	6	22	5
--	Multiple codes 20-39	4,412	1,439	32 6	488	122	171	125	351	45	64	73
--	No codes 20-39	802	191	23 8	75	29	18	17	19	15	15	3
491/493	Electric Utilities	6,458	460	7 1	251	49	73	42	45	0	0	0
5169	Chemical Wholesale Distributors	1,802	344	19 1	166	50	101	6	15	5	0	1
5171	Petroleum Terminals/Bulk Storage	4,135	596	14 4	167	4	342	2	71	0	9	1
7389/4953	Hazardous Waste/Solvent Recovery	2,721	527	19 4	352	0	125	0	44	0	6	0
	Total	**83,218**	**18,340**	**22.0**	**6,474**	**1,305**	**2,887**	**1,680**	**3,719**	**574**	**983**	**718**

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

changed for these chemicals beginning with the 2000 reporting year.

On- and Off-site Releases, 2000–2001

Table 2-8 shows total forms and total releases for TRI industries for 2000 and 2001. During this period, the number of forms submitted for chemicals comparable in both years decreased from 90,659 to 86,952, a decrease of 4.1 percent. Total on- and off-site releases decreased from 6.77 billion pounds to 5.72 billion pounds, a reduction of 15.5 percent from 2000 to 2001. In this period, all the industries except measurement/photographic, petroleum terminals/bulk storage, printing, tobacco, and the group with no codes 20-39 reported declines in total on- and off-site releases.

In both 2000 and 2001, the metal mining industry reported the largest total on- and off-site releases of all industry groups. Its reduction of 459.1 million pounds (15.8 percent) from 2000 to 2001 was the largest decline. Electric utilities reported the second-largest total releases in both 2000 and 2001 and a reduction of 98.3 million pounds or 8.5 percent.

The chemical manufacturing industry reported the third-largest total releases in both 2000 and 2001, with a reduction of 95.7 million pounds or 14.5 percent. The primary metals industry reported the fourth-largest total releases in both 2000 and 2001, with a reduction of 58.0 million pounds (10.1 percent). The hazardous waste/solvent recovery sectors reported a decrease of 82.3 million pounds (29.5 percent). Other industry sectors reported less than 200 million pounds in 2001 and reductions of less than 35 million pounds or reported increases.

Of the industries reporting increases from 2000 to 2001, petroleum terminals/bulk storage facilities

Table 2-8: TRI Forms and Total Releases by Industry, 2000-2001

SIC Code	Industry	Total Forms				Total On- and Off-site Releases			
		2000	2001	Change 2000-2001		2000	2001	Change 2000-2001	
		Number	Number	Number	Percent	Pounds	Pounds	Pounds	Pounds
10	Metal Mining	638	580	-58	-9.1	3,049,654,386	2,447,128,330	-602,526,056	-19.8
12	Coal Mining	264	286	22	8 3	15,628,605	14,871,577	-757,028	-4 8
20	Food	3,553	3,544	-9	-0.3	129,638,460	125,013,901	-4,624,559	-3.6
21	Tobacco	84	63	-21	-25 0	3,149,481	3,556,057	406,576	12.9
22	Textiles	654	639	-15	-2.3	8,326,912	6,928,336	-1,398,576	-16.8
23	Apparel	40	39	-1	-2 5	565,353	401,151	-164,202	-29 0
24	Lumber	2,207	2,127	-80	-3.6	34,637,171	31,333,015	-3,304,156	-9.5
25	Furniture	707	527	-180	-25.5	12,313,189	7,990,110	-4,323,079	-35 1
26	Paper	2,986	2,884	-102	-3.4	227,678,878	195,186,367	-32,492,512	-14.3
27	Printing	441	439	-2	-0 5	19,004,562	19,686,261	681,699	3 6
28	Chemicals	20,989	19,832	-1,157	-5.5	658,268,461	562,582,951	-95,685,509	-14.5
29	Petroleum	4,179	4,122	-57	-1 4	73,759,780	71,277,700	-2,482,079	-3 4
30	Plastics	3,923	3,603	-320	-8.2	107,328,288	88,373,213	-18,955,075	-17.7
31	Leather	179	149	-30	-16 8	3,643,527	2,614,681	-1,028,846	-28 2
32	Stone/Clay/Glass	2,257	2,214	-43	-1.9	41,235,852	38,306,773	-2,929,079	-7.1
33	Primary Metals	6,844	6,398	-446	-6 5	572,208,260	514,240,377	-57,967,882	-10 1
34	Fabricated Metals	7,700	7,132	-568	-7.4	76,478,614	63,403,252	-13,075,362	-17.1
35	Machinery	2,794	2,580	-214	-7 7	19,336,595	15,249,314	-4,087,281	-21 1
36	Electrical Equip.	2,907	2,631	-276	-9.5	31,962,063	22,436,264	-9,525,800	-29.8
37	Transportation Equip	4,587	4,477	-110	-2 4	96,342,304	80,048,302	-16,294,002	-16 9
38	Measure/Photo.	603	575	-28	-4 6	9,096,092	9,318,583	222,492	2.4
39	Miscellaneous	674	611	-63	-9 3	8,862,085	8,405,244	-456,841	-5 2
--	Multiple codes 20-39	4,662	4,349	-313	-6 7	123,533,027	102,943,811	-20,589,216	-16.7
--	No codes 20-39	523	656	133	25 4	8,405,621	11,375,702	2,970,080	35 3
491/493	Electric Utilities	6,052	6,077	25	0.4	1,151,208,360	1,052,934,677	-98,273,683	-8.5
5169	Chemical Wholesale Distributors	3,464	3,323	-141	-4 1	1,523,560	1,464,031	-59,529	-3.9
5171	Petroleum Terminals/Bulk Storage	4,133	4,504	371	9.0	3,919,473	21,334,352	17,414,879	444.3
7389/4953	Hazardous Waste/Solvent Recovery	2,615	2,591	-24	-0 9	278,931,362	196,601,036	-82,330,326	-29 5
	Total	**90,659**	**86,952**	**-3,707**	**-4.1**	**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

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

had the highest, with an increase of 17.4 million pounds or over 400 percent. It also had an increase of 9.0 percent in the forms submitted.

Waste Management Data, 2000–2001

As shown in Table 2-9, TRI facilities reported managing 32.57 billion pounds of toxic chemicals in production-related waste in 2000 and 25.50 billion pounds in 2001. This was a decrease of 7.07 billion pounds or 21.7 percent.

The chemical manufacturing industry reported the largest absolute decrease from 2000 to 2001, from 15.74 billion pounds to 10.68 billion pounds, a reduction of 5.07 billion pounds, or 32.2 percent. The primary metals industry reported the second-largest decrease, from 3.52 billion pounds to 2.66 billion pounds, a net decrease of 859.9 million pounds, or 24.4 percent. The third largest decrease came from the metal mining industry, which went from 3.14 billion pounds in 2000 to 2.53 billion pounds, a decrease of 607.7 million pounds, or 19.3 percent.

The multiple-codes group (forms reporting more than one two-digit SIC code within the range of 20-39) reported a decrease of 401.3 million pounds or 29.8 percent. Three other industries reported reductions of about 100 million pounds: paper with a reduction of 106.7 million pounds or 7.2 percent, lumber also with a reduction of 106.7 million pounds or 60.7 percent, and electrical equipment with a reduction of 99.3 million pounds or 24.0 percent.

Table 2-9: TRI Total Production-related Waste Managed by Industry, 2000-2001

SIC Code	Industry	Total Production-related Waste Managed			
		2000	2001	Change 2000-2001	
		Pounds	Pounds	Pounds	Pounds
10	Metal Mining	3,141,813,435	2,534,067,408	-607,746,027	-19 3
12	Coal Mining	16,046,973	15,245,126	-801,847	-5 0
20	Food	600,976,374	1,090,021,161	489,044,787	81 4
21	Tobacco	5,300,483	5,302,516	2,033	0 04
22	Textiles	44,165,680	40,681,466	-3,484,213	-7.9
23	Apparel	1,895,870	1,803,385	-92,485	-4 9
24	Lumber	175,743,964	69,085,194	-106,658,770	-60 7
25	Furniture	23,968,255	14,997,035	-8,971,220	-37 4
26	Paper	1,480,615,299	1,373,899,889	-106,715,410	-7.2
27	Printing	365,352,059	370,480,920	5,128,861	1 4
28	Chemicals	15,744,981,755	10,679,613,005	-5,065,368,750	-32 2
29	Petroleum	833,421,432	878,433,051	45,011,619	5 4
30	Plastics	227,142,891	204,339,414	-22,803,477	-10 0
31	Leather	18,027,427	8,407,158	-9,620,269	-53 4
32	Stone/Clay/Glass	616,841,654	567,336,466	-49,505,187	-8 0
33	Primary Metals	3,518,251,237	2,658,357,555	-859,893,682	-24 4
34	Fabricated Metals	719,077,431	648,366,435	-70,710,996	-9 8
35	Machinery	139,996,236	127,310,768	-12,685,468	-9 1
36	Electrical Equip	413,661,945	314,410,782	-99,251,163	-24.0
37	Transportation Equip	282,633,918	253,110,688	-29,523,230	-10 4
38	Measure/Photo.	69,304,199	61,995,124	-7,309,074	-10.5
39	Miscellaneous	42,606,974	40,655,195	-1,951,778	-4 6
--	Multiple codes 20-39	1,349,058,331	947,713,219	-401,345,111	-29 8
--	No codes 20-39	25,049,930	24,095,792	-954,138	-3 8
491/493	Electric Utilities	1,633,126,253	1,552,455,699	-80,670,554	-4.9
5169	Chemical Wholesale Distributors	23,224,057	41,070,757	17,846,700	76 8
5171	Petroleum Terminals/Bulk Storage	40,628,072	46,271,156	5,643,085	13.9
7389/4953	Hazardous Waste/Solvent Recovery	1,016,747,365	932,484,480	-84,262,885	-8 3
	Total	**32,569,659,498**	**25,502,010,846**	**-7,067,648,652**	**-21.7**

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

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

The food industry reported the largest increase from 2000 to 2001. This industry's toxic chemicals in production-related waste rose from 601.0 million pounds in to 1.09 billion pounds, an increase of 489.0 million pounds, or 81.4 percent. The petroleum refining industry reported the second-largest increase, an increase of 45.0 million pounds, from 833.4 million pounds to 878.4 million pounds, a 5.4 percent increase. Chemical wholesale distributors reported an increase of 17.8 million pounds or 76.8 percent. Two other industry groups had increases of about 5 million pounds from 2000 to 2001: petroleum terminals/bulk storage facilities, with an increase of 5.6 million pounds or 13.9 percent, and the printing industry, with an increase of 5.1 million pounds or 1.4 percent. The only other industry to report an increase was the tobacco industry with an increase of just over 2,000 pounds or less than one percent.

TRI DATA FOR 1998-2001

Comparisons of TRI data across reporting years are made on the basis of chemicals that were reportable in all years with the same reporting definitions. **Making Year-to-Year Comparisons of TRI Data**, in Chapter 1, explains the issues involved in making multi-year analyses. An understanding of these year to year changes is essential for accurate interpretation of the multi-year data presented in this chapter. Comparisons of the years 1998, 2000 and 2001 require that PBT chemicals (see Chapter 3 for a discussion of these chemicals), vanadium and vanadium compounds be omitted from the data.

On- and Off-site Releases, 1998 and 2000–2001

Table 2-10 shows TRI data for the years 1998, 2000 and 2001. Between 1998 and 2001, total on- and

Table 2-10: TRI Forms and Total Releases, 1998 and 2000-2001

		Total Forms					Total On- and Off-site Releases				
SIC Code	Industry	1998 Number	2000 Number	2001 Number	Change 2000-2001 Percent	Change 1998-2001 Percent	1998 Pounds	2000 Pounds	2001 Pounds	Change 2000-2001 Percent	Change 1998-2001 Percent
10	Metal Mining	711	554	499	-9 9	-29.8	3,337,371,653	3,002,844,396	2,395,124,862	-20 2	-28 2
12	Coal Mining	179	203	216	6 4	20 7	12,980,197	14,988,396	14,153,391	-5 6	9 0
20	Food	3,201	3,241	3,229	-0.4	0 9	133,527,879	129,486,395	124,865,409	-3.6	-6.5
21	Tobacco	66	78	56	-28 2	-15 2	3,618,629	3,149,255	3,555,777	12 9	-1 7
22	Textiles	547	491	460	-6 3	-15 9	12,098,859	8,195,943	6,876,040	-16 1	-43.2
23	Apparel	43	40	39	-2 5	-9 3	602,859	565,353	401,151	-29 0	-33 5
24	Lumber	2,080	1,998	1,900	-4 9	-8.7	35,258,094	34,523,090	31,314,225	-9 3	-11.2
25	Furniture	911	701	519	-26 0	-43 0	17,296,600	12,313,189	7,990,110	-35 1	-53 8
26	Paper	2,492	2,376	2,272	-4 4	-8 8	232,742,539	227,040,367	194,644,353	-14.3	-16 4
27	Printing	462	434	430	-0 9	-6 9	22,524,872	19,004,270	19,680,796	3 6	-12 6
28	Chemicals	20,503	20,192	19,036	-5 7	-7 2	718,659,104	649,342,324	554,013,981	-14 7	-22 9
29	Petroleum	3,414	3,364	3,329	-1 0	-2 5	163,009,729	72,615,551	69,858,369	-3 8	-57 1
30	Plastics	3,758	3,771	3,451	-8.5	-8 2	112,520,726	107,114,728	88,118,503	-17.7	-21 7
31	Leather	194	170	142	-16 5	-26 8	4,835,113	3,624,907	2,614,654	-27 9	-45 9
32	Stone/Clay/Glass	1,889	1,927	1,856	-3 7	-1 7	41,373,767	40,483,175	37,803,472	-6.6	-8 6
33	Primary Metals	6,562	6,417	5,961	-7 1	-9 2	585,940,153	567,551,522	510,911,048	-10 0	-12 8
34	Fabricated Metals	7,602	7,642	7,088	-7 2	-6.8	85,672,853	76,463,103	63,394,894	-17.1	-26 0
35	Machinery	2,957	2,763	2,542	-8 0	-14 0	21,202,286	19,316,816	15,237,482	-21 1	-28 1
36	Electrical Equip	2,885	2,782	2,516	-9 6	-12 8	30,533,296	31,798,750	22,294,684	-29 9	-27 0
37	Transportation Equip	4,544	4,493	4,369	-2 8	-3 9	102,078,856	96,328,955	80,026,949	-16 9	-21 6
38	Measure/Photo	611	558	533	-4 5	-12 8	12,205,485	9,080,915	9,305,836	2 5	-23 8
39	Miscellaneous	712	651	581	-10 8	-18 4	10,399,282	8,858,237	8,402,636	-5 1	-19 2
--	Multiple codes 20-39	4,483	4,391	4,087	-6.9	-8 8	124,046,116	121,519,781	101,922,488	-16 1	-17 8
--	No codes 20-39	457	474	603	27 2	31 9	6,444,366	8,401,306	11,325,679	34 8	75 7
491/493	Electric Utilities	4,125	4,070	4,066	-0 1	-1 4	1,118,019,767	1,119,578,131	1,020,869,982	-8.8	-8 7
5169	Chemical Wholesale Distributors	3,629	3,456	3,311	-4 2	-8 8	1,549,205	1,523,560	1,463,928	-3 9	-5 5
5171	Petroleum Terminals/Bulk Storage	3,753	3,526	3,825	8 5	1 9	4,504,151	3,766,217	21,316,334	466 0	373 3
7389/4953	Hazardous Waste/Solvent Recovery	2,297	2,273	2,259	-0 6	-1 7	244,247,514	275,752,420	193,268,850	-29 9	-20 9
	Total	**85,067**	**83,036**	**79,175**	**-4.6**	**-6.9**	**7,195,263,950**	**6,665,231,053**	**5,610,755,885**	**-15.8**	**-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 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

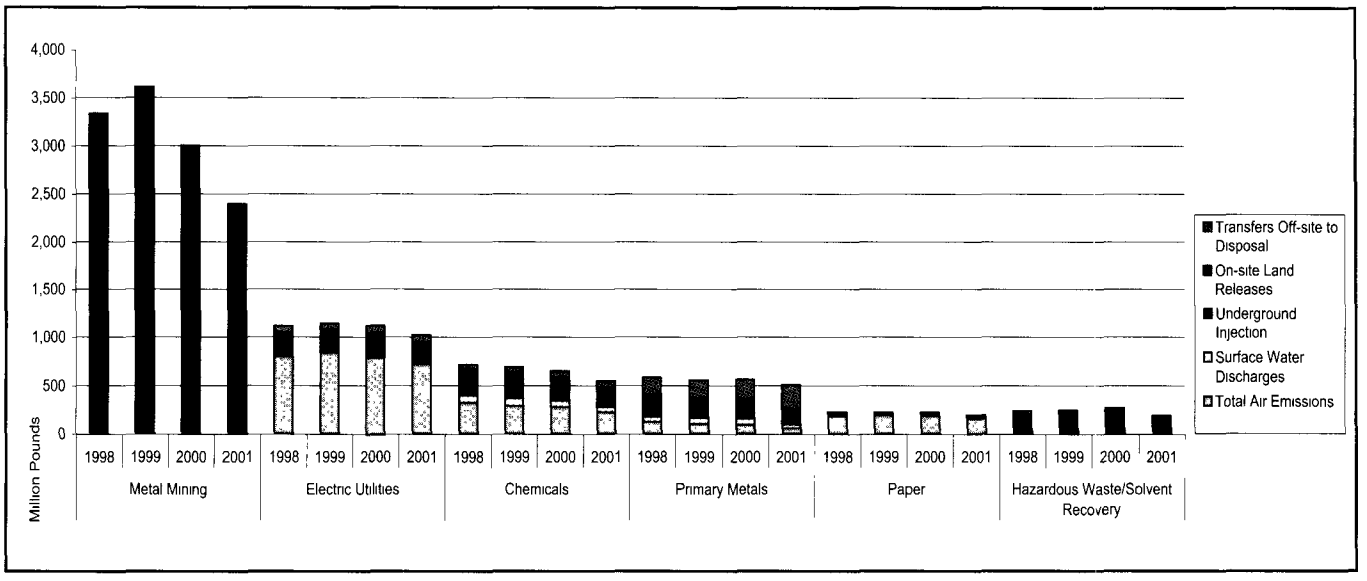
off-site releases decreased from 7.20 billion pounds to 5.61 billion pounds, a decline of 22.0 percent. The change in the latest year, 2000 to 2001 was a decrease of 15.8 percent. Between 1998 and 2001, the number of forms for chemicals comparable in all years submitted dropped from 85,067 to 79,175, a decrease of 6.9 percent.

The metal mining industry had the largest total releases on- and off-site in all three years, 1998, 2000 and 2001. It was the industry with the largest absolute decrease, of 942.2 million pounds from 1998 to 2001. Metal mining facilities decreased total releases overall by 28.2 percent from 1998 to 2001 and by 20.2 percent in the latest time period, 2000 to 2001. The metal mining industry showed a net increase from 1998 to 1999 with subsequent decreases in the next two years (see Figure 2-3).

The industry with the second-largest total releases, electric utilities, also showed a decrease from 1998 to 2001, of 8.7 percent. However, electric utilities had reported a net increase from 1998 to 2000, of 1.6 million pounds or less than one percent. The chemical manufacturing industry had the third-largest total releases on- and off-site from 1998 to 2001. It had the second-largest absolute reduction, with a decrease of 164.6 million pounds and a reduction of 22.9 percent over the period.

Three industry groups reported increases from 1998 to 2001. Releases from petroleum terminals/bulk

Figure 2-3: TRI Total On-site and Off-site Releases, Industries with Largest Total, 1998-2000



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

storage facilities increased by 16.8 million pounds or over 373 percent. While the number of forms reported by this industry had increased overall from 1998 to 2001, by 72 or 1.9 percent, the number had decreased from 1998 to 2000 by 227 showing a subsequent increase from 2000 to 2001 of 299 forms.

The two other industry groups with increases were the group of forms reporting no SIC codes (that is, no codes required to be reported to TRI) and coal mining. The group with no SIC codes had an increase in forms of 31.9 percent and in total releases of 75.7 percent from 1998 to 2001. Coal mining facilities reported a 20.7 percent increase in forms and a 9.0 percent increase in total releases from 1998 to 2001, after having reported a decrease in total releases of 5.6 percent from 1998 to 2000.

Waste Management Data, 1998 and 2000–2001

As shown in Table 2-11, 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, a 7.9 percent decrease. However, the toxic chemicals in production-related waste increased from 1998 to 2000, from 27.54 billion pounds to 32.42 billion pounds, resulting in an overall increase of 4.88 billion pounds or 17.7 percent, with a subsequent drop from 2000 to 2001 of 7.61 billion pounds or 21.8 percent.

The chemical manufacturing industry, with the largest amounts of toxic chemicals in production-related waste during the period from 1998 to 2001, reported a net increase from 1998 to 2001 of 3.1 percent. However, a decrease of 5.06 billion pounds in the most recent period, from 2000 to 2001, somewhat offset the large increases in prior years, a net increase of 5.39 billion pounds from 1998 to 2000 (see also Figure 2-4).

The primary metals industry had the second-largest quantity of toxic chemicals in production-related waste in 2001 as opposed to the metal mining industry, which held this position in 1998. Both of these industries reported decreases from 1998 to 2001. The primary metals industry had a net decrease of 430.3 million pounds or 14.0 percent from 1998 to 2001, and the metal mining industry had a net decrease of 1.13 billion pounds or 31.2

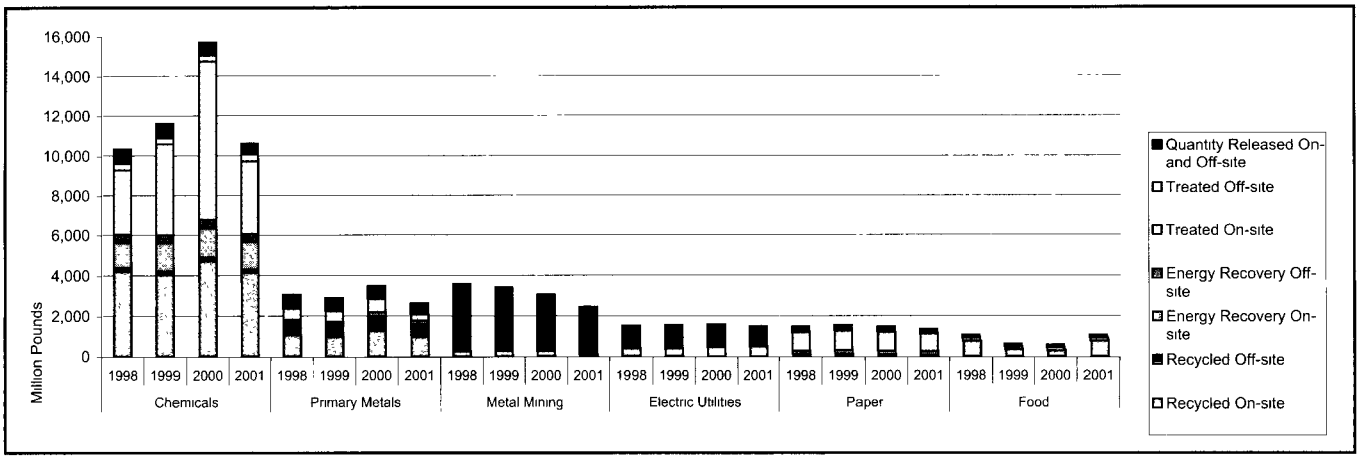
Table 2-11: TRI Total Production-related Waste Managed by Industry, 1998 and 2000-2001

SIC Code	Industry	Total Production-related Waste Managed						
		1998	2000	2001	Change 2000-2001		Change 1998-2001	
		Pounds	Pounds	Pounds	Pounds	Percent	Pounds	Pounds
10	Metal Mining	3,608,733,220	3,098,143,455	2,481,786,246	-616,357,209	-19 9	-1,126,946,974	-31.2
12	Coal Mining	13,478,476	15,407,259	14,527,210	-880,049	-5 7	1,048,734	7 8
20	Food	1,089,073,581	600,427,195	1,088,676,460	488,249,265	81.3	-397,121	-0 04
21	Tobacco	5,907,399	5,300,257	5,302,236	1,979	0 04	-605,163	-10 2
22	Textiles	49,293,935	44,062,732	40,578,139	-3,484,593	-7.9	-8,715,796	-17 7
23	Apparel	1,920,919	1,895,870	1,803,385	-92,485	-4 9	-117,534	-6 1
24	Lumber	63,493,916	175,413,059	68,470,249	-106,942,811	-61.0	4,976,333	7 8
25	Furniture	32,957,866	23,968,255	14,997,034	-8,971,221	-37 4	-17,960,832	-54 5
26	Paper	1,476,450,418	1,479,788,509	1,373,244,775	-106,543,734	-7.2	-103,205,643	-7.0
27	Printing	300,646,333	365,351,767	370,475,455	5,123,688	1 4	69,829,122	23 2
28	Chemicals	10,336,213,842	15,724,070,676	10,660,684,644	-5,063,386,032	-32.2	324,470,802	3.1
29	Petroleum	1,053,354,400	830,433,364	874,957,447	44,524,083	5.4	-178,396,953	-16.9
30	Plastics	260,807,868	225,897,970	203,876,026	-22,021,944	-9.7	-56,931,842	-21.8
31	Leather	10,760,483	17,972,644	8,406,552	-9,566,092	-53.2	-2,353,931	-21 9
32	Stone/Clay/Glass	696,976,031	616,620,095	566,829,148	-49,790,947	-8.1	-130,146,883	-18.7
33	Primary Metals	3,081,686,210	3,509,833,346	2,651,415,299	-858,418,048	-24 5	-430,270,911	-14.0
34	Fabricated Metals	708,983,457	719,061,580	648,357,622	-70,703,959	-9.8	-60,625,836	-8.6
35	Machinery	148,537,242	139,943,299	127,291,913	-12,651,386	-9 0	-21,245,328	-14.3
36	Electrical Equip.	410,723,885	405,106,370	309,059,826	-96,046,544	-23 7	-101,664,059	-24.8
37	Transportation Equip	302,423,453	282,620,688	253,088,358	-29,532,330	-10 4	-49,335,095	-16 3
38	Measure/Photo.	75,104,565	69,278,227	61,971,990	-7,306,236	-10 5	-13,132,575	-17.5
9	Miscellaneous	50,848,238	42,595,503	40,644,907	-1,950,597	-4 6	-10,203,331	-20.1
--	Multiple codes 20-39	1,074,551,644	1,343,644,331	943,612,660	-400,031,672	-29.8	-130,938,984	-12.2
--	No codes 20-39	30,712,834	24,814,899	23,947,941	-866,957	-3 5	-6,764,893	-22 0
491/493	Electric Utilities	1,519,915,995	1,595,650,886	1,514,644,820	-81,006,066	-5.1	-5,271,175	-0.3
5169	Chemical Wholesale Distributors	56,299,586	23,224,055	41,070,584	17,846,529	76 8	-15,229,003	-27 0
5171	Petroleum Terminals/Bulk Storage	60,872,217	40,463,314	46,250,475	5,787,161	14.3	-14,621,742	-24.0
7389/4953	Hazardous Waste/Solvent Recovery	1,021,510,214	998,367,491	922,569,642	-75,797,850	-7 6	-98,940,572	-9 7
	Total	**27,542,238,226**	**32,419,357,097**	**25,358,541,041**	**-7,060,816,055**	**-21.8**	**-2,183,697,185**	**-7.9**

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

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

Figure 2-4: TRI Total Production-related Waste Managed, Industries with the Largest Total, 1998-2001



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

percent. Electric utilities reported the third-largest quantity of toxic chemicals in production-related waste during the time period 1998-2001, with a decrease of 5.3 million pounds or less than one percent. However, electric utilities reported a net increase from 1998 to 2000 (of 75.7 million pounds) offset by a net decrease of 81.0 million pounds or 5.1 percent from 2000 to 2001.

Two other industries reported over 1 billion pounds of toxic chemicals in production-related waste in 2001: paper and food. The paper industry reported a 7.0 percent decrease from 1998 to 2001. The food industry had a net decrease of less than one percent from 1998 to 2001, with an increase of 488.2 million pounds or 81.3 percent in the latest time period 2000 to 2001.

Aside from the chemical manufacturing industry, three other industries reported increases from 1998 to 2001. They were printing, lumber and coal mining. The printing industry reported an increase of 23.2 percent, or 69.8 million pounds, from 1998 to 2001. The lumber and coal mining industries both reported an increase of 7.8 percent. For lumber facilities, this represented an increase of 5.0 million pounds and, for coal mining facilities, an increase of 1.0 million pounds.

Economic Overview, by Industry, Multi-Year Comparisons

As shown in Table 2-12, both overall production at manufacturing facilities and production at electric utilities expanded from 1998 to 2000 but contracted from 2000 to 2001. For coal mining and metal mining, however, production contracted from 1998 to 2001, although from 2000 to 2001 coal mining production did increase.

The only industry groups that showed increases in production over 1998 were computer and electronic products with an increase of 52.0 percent, the chemical manufacturing industry with an increase of 4.3 percent and miscellaneous manufacturing with an increase of less than one percent.

Table 2-12: Industrial Production Indexes by Industry, 1998-2001

NAICS Code	Industry (NAICS)	1998	1999	2000	2001	SIC Code	Industry (SIC)
	Manufacturing	100.0	106.1	108 0	100.8		
	Durable manufacturing	100 0	108 1	113 2	103 2		
321	Wood products	100.0	101.1	92.3	92.0	24	Lumber
327	Nonmetallic mineral products	100 0	99 3	98 7	98 5	32	Stone/Clay/Glass
331	Primary metals	100.0	104 2	93.4	78.4	33	Primary Metals
332	Fabricated metal products	100 0	103 1	102 0	94 8	34	Fabricated Metals
333	Machinery	100.0	101.7	104.8	85.2	35	Machinery
334	Computer and electronic products	100 0	132 2	169 5	152 0	36 and 38	Electrical Equip /Measure/Photo.
335	Electrical equipment, appliance, and components	100 0	104.4	106 9	94.6	36	Electrical Equip
3361-3	Motor vehicles and parts	100 0	103 7	94 6	96 8	37	Transportation Equip
3364-9	Aerospace and miscellaneous transportation equipment	100 0	87 5	85.2	79.1	37	Transportation Equip.
337	Furniture and related products	100 0	104 2	103 9	94 5	25	Furniture
339	Miscellaneous	100 0	102.6	106.5	100 5	38 and 39	Measure/Photo /Miscellaneous
	Nondurable manufacturing	100.0	103.2	101 1	97.4		
311,312	Food, beverage, and tobacco	100 0	101 1	100 7	98 5	20 and 21	Food/Tobacco
313,314	Textiles and products	100 0	102.8	95.6	83.0	22	Textiles
315,316	Apparel and leather goods	100 0	96 0	89 8	79 3	23 and 31	Apparel/Leather
322	Paper	100.0	101 9	95.7	89 8	26	Paper
323	Printing and related support activities	100 0	100 2	98 6	93 0	27	Printing
324	Petroleum and coal products	100.0	100 8	100 0	98.7	29	Petroleum
325	Chemicals	100 0	107 3	106 4	104 3	28	Chemicals
326	Plastics and rubber products	100.0	105 9	102.5	97.9	30	Plastics
21	Mining						
2121	Coal mining	100 0	99 97	94 7	97 4	12	Coal Mining
2122	Metal ore mining	100.0	93.2	95.6	81.6	10	Metal Mining
2211,2212	Electric and gas utilities						
2211	Electric power generation, transmission and distribution	100 0	102 5	108 7	101 0	491/493	Electric Utilities

Note: Production from Board of Governors of the Federal Reserve System, Industrial Production and Capacity Utilization, Statistical Release G17, Table 2a (http //www federalreserve gov/releases/G17) and is based on North American Industrial Classification System (NAICS)

Several industry groups showed declines in production over 1998. Those with the largest declines were primary metals, aerospace and miscellaneous transportation equipment, and apparel and leather goods, each with a decline of over 20 percent from 1998 to 2001.

Some industries only showed declines in the most recent period, 2000 to 2001, after having increased from 1998 to 2000. They were machinery, electrical equipment and miscellaneous manufacturing.

Table 2-12 presents production indexes for each industrial sector from 1998 to 2001. During this period, production increased by 0.8 percent for U.S. manufacturing as a whole, by 1.0 percent for electric utilities but decreased for coal mining and metal mining. These data are based on the North American Industrial Classification System (NAICS), a system to classify facilities into industry sectors adopted by the three North American countries (the US, Canada and Mexico) in 1997. It replaces the US Standard Industrial Classification System (SIC) used currently by TRI. Table 2-12 shows the equivalent SIC codes categories. More information on the correspondence between these two systems can be found at http://www.census.gov/epcd/naics/nsic2ndx.htm#S3.

Table 2-13 compares the change in production in the TRI industries since 1998 with the change in the quantities of TRI chemicals released on- and off-site and in production-related waste managed. As shown in Table 2-13, the quantity released on- and off-site steadily decreased while the quantity of toxic chemicals in production-related waste increased from 1998 to 1999 and from 1999 to 2000 before decreasing from 2000 to 2001.

Table 2-13: Percentage Change in Industrial Production and in TRI Quantities in Waste, 1998-2001

SIC Code	Industry	Industrial Production Percent Change				TRI Quantity Released On- and Off-site Percent Change				TRI Total Production-related Waste Percent Change			
		1998-1999	1999-2000	2000-2001	1998-2001	1998-1999	1999-2000	2000-2001	1998-2001	1998-1999	1999-2000	2000-2001	1998-2001
10	Metal Mining	-6.8	2.4	-14.1	-18.4	-5.6	-10 9	-14.6	-28 2	-4.9	-9.7	-19.9	-31.2
12	Coal Mining	0 0	-5.2	2 6	-2.6	-19 6	44 3	-5 8	9 2	-19 1	41 4	-5.7	7 8
20	Food	NA	NA	NA	NA	0 0	0.4	-4.8	-4.4	-40.8	-6.9	81.3	-0.04
21	Tobacco	NA	NA	NA	NA	-12 2	-1 7	3 2	-11 0	-14 4	4.9	0.0	-10 2
22	Textiles	2.8	-7.2	-12.6	-17.0	-21 4	-11.3	-18 9	-43.5	-12.0	1.5	-7.9	-17.7
23	Apparel	NA	NA	NA	NA	-9.8	-0 8	-31 5	-38 7	-5 7	4 7	-4 9	-6 1
24	Lumber	1.1	-8.8	-0.3	-8 0	2.8	-3.6	-9.3	-10.1	-4 1	187.9	-61 0	7.8
25	Furniture	4 2	-0 4	-9 4	-5 5	-16 8	-14 3	-32 9	-52 1	-14 0	-15 4	-37 4	-54 5
26	Paper	1 9	-6 2	-5.9	-10.2	-1.1	-0 9	-14.5	-16.2	5 0	-4.5	-7 2	-7.0
27	Printing	0 2	-1 6	-5 6	-7 0	-6 2	-8 6	3 5	-11 2	5 7	14.9	1 4	23.2
28	Chemicals	7 3	-0.9	-2 1	4 3	-3.0	-5.1	-13.6	-20.4	12.4	35.4	-32.2	3.1
29	Petroleum	0 8	-0 9	-1 3	-1 3	-4.5	-1 7	-2 9	-8 8	-4 7	-17 3	5 4	-16 9
30	Plastics	5 9	-3.5	-4.5	-2 1	-0.3	-6.6	-15.1	-21.0	-4.5	-9.3	-9 7	-21.8
31	Leather	NA	NA	NA	NA	-10 2	-12 5	-27 1	-42 8	34 7	24 0	-53 2	-21.9
32	Stone/Clay/Glass	-0.7	-0.6	-0.2	-1.5	-3 8	3 6	-8.2	-8 5	10.1	-19.6	-8.1	-18.7
33	Primary Metals	4 2	-10 7	-15 1	-21 6	-4 4	-4 2	-13 2	-20 5	-4.9	19.8	-24 5	-14 0
34	Fabricated Metals	3 1	-1.1	-7.1	-5 2	-1.9	-2.6	-16.5	-20.2	3.5	-2.0	-9 8	-8.6
35	Machinery	1 7	3 0	-19 5	-14 8	-21 4	19 1	-16.1	-21 5	-4 9	-0 9	-9 0	-14 3
36	Electrical Equip.	NA	NA	NA	NA	3 6	-7 4	-23.2	-26 4	-6.6	5.6	-23 7	-24 8
37	Transportation Equip	NA	NA	NA	NA	-0 3	-8 3	-15 9	-23 1	3 8	-9 9	-10 4	-16 3
38	Measure/Photo.	2 6	4.0	-6 0	NA	-8 3	-12.6	0.3	-19.6	-3.8	-4.1	-10.5	-17 5
39	Miscellaneous	NA	NA	NA	NA	-8 7	-11 3	-13 7	-30 2	-4 3	-12 5	-4 6	-20 1
--	No codes 20-39	NA	NA	NA	NA	-7.7	-6 3	45 3	25.7	-11.1	-9.1	-3.5	-22 0
--	Multiple codes 20-39	NA	NA	NA	NA	2 2	-4 3	-16 3	-18 1	-2 3	27 9	-29 8	-12 2
491/493	Electric Utilities	2.5	6.2	-7 6	1.0	2.8	-2 5	-8.7	-8.5	2.4	2.6	-5.1	-0 3
5169	Chemical Wholesale Distributors	NA	NA	NA	NA	-17 0	5 4	0 8	-11 8	-25 2	-44.8	76 8	-27 0
5171	Petroleum Terminals/Bulk Storage	NA	NA	NA	NA	-71.5	-7.2	-11.1	-76 5	-18.6	-18.4	14.3	-24.0
7389/4953	Hazardous Waste/Solvent Recovery	NA	NA	NA	NA	-0.2	15.2	-29 6	-19 1	-5 1	3.0	-7 6	-9.7
	Total	**NA**	**NA**	**NA**	**NA**	**-3.3**	**-6.1**	**-13.6**	**-21.6**	**1.9**	**15.5**	**-21.8**	**-7.9**

Note: Production from Board of Governors of the Federal Reserve System, Industrial Production and Capacity Utilization, Statistical Release G17, Table 2a (http //www fed-eralreserve gov/releases/G17) and is based on North American Industrial Classification System (NAICS) TRI Quantities from TRI Form R, Section 8 of year indicated and based on US Standard Industrial Classification system (SIC)

NA not available

Because the industrial production data in Table 2-13 are based on NAICS codes, data are not available for all of the TRI industry categories. However, for those with corresponding data, some industries showed larger percentage decreases in total releases on- and off-site or in the quantity of toxic chemicals in production-related waste than in industrial production. The furniture, plastics, stone/clay/glass, petroleum refining, and fabricated metals industries all had percentage decreases in total releases and the quantity of toxic chemicals in production-related waste larger than their percentage decrease in industrial production. On the other hand, the primary metals, machinery, paper had smaller percentage decreases in the quantity of toxic chemicals in production-related waste than in industrial production from 1998 to 2001. The primary metals industry had the largest percentage reduction in industrial production, with a decline of 21.6 percent from 1998 to 2001. This industry reduced total releases by 20.5 percent and the quantity of toxic chemicals in production-related waste by 14.0 percent.

The two industries with an increase in industrial production from 1998 to 2001 were chemical manufacturing and electric utilities. The chemical manufacturing industry showed an increase of 4.3 percent in industrial production from 1998 to 2001 and an increase of 3.1 percent in the quantity of toxic chemicals in production-related waste. Its total releases on- and off-site decreased by 20.4 percent during that same time period. Electric utilities reported overall decreases, of 8.5 percent in total releases and less than one percent in the quantity of toxic chemicals in production-related waste from 1998 to 2001, while showing an increase of 1.0 percent in industrial production.

Several industries reported increases in the quantity of toxic chemicals in production-related waste from 1998 to 2001 but had a decrease in industrial production during that same time period. These industries included lumber, printing, and coal mining. While lumber and printing did report increases in the quantity of toxic chemicals in production-related waste, at the same time they had percentage decreases in the quantity released on- and off-site greater than the percentage decrease in industrial production.

TRI DATA FOR FEDERAL FACILITIES, 2001

Federally owned facilities that are operated by federal agencies or contractors are required to report to TRI, regardless of SIC code pursuant to Executive Order 13148. Tables in this chapter list the federal agencies that have facilities reporting to TRI. Department of Defense (DOD) data are presented for DOD as a whole and for each defense agency. In addition, Environmental Protection Agency (EPA) data are presented for EPA as a whole and for EPA Fund-Lead Superfund sites separately from other EPA facilities.

In 2001, a total of 283 federal facilities submitted 935 TRI forms; as shown in Table 2-14. Of these, 172 facilities were owned or operated by the Department of Defense (DOD), 26 by the Tennessee Valley Authority (TVA), and 23 by the Department of Energy (DOE).

DOD agencies submitted 525 forms. These DOD submissions included 260 reports by Army facilities, 112 reports by Air Force facilities and 82 reports by Navy facilities. TVA facilities submitted 243 forms and DOE facilities submitted 54 forms.

On- and Off-site Releases, 2001

Table 2-14 also shows that federal facilities reported a total of 79.0 million pounds of on- and off-site releases in 2001. The bulk of the releases, 77.3 million pounds, occurred on-site. Off-site releases totaled 1.8 million pounds.

Tennessee Valley Authority facilities reported 61.4 million pounds of on- and off-site releases. This amount represented 77.7 percent of all releases by all federal facilities. It included the largest amounts in air emissions and other on-site land releases (that is, on-site land releases to other than RCRA subtitle C landfills). TVA's releases included 41.3 million pounds of air emissions and 18.7 million pounds of other on-site land releases.

Table 2-14: TRI On-site and Off-site Releases by Agency, 2001: Federal Facilities

			On-site Releases							Off-site	
					Underground Injection		On-site Land Releases			Releases	Total
Federal Agency	Total Facilities	Total Forms	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	On- and Off-site Releases
	Number	Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Department of Defense	172	525	2,964,552	4,024,363	0	0	0	5,869,743	12,858,658	928,474	13,787,132
Air Force	35	112	910,939	110,405	0	0	0	1,014,977	2,036,321	109,065	2,145,387
Army	78	260	1,596,769	3,527,879	0	0	0	3,767,221	8,891,869	438,393	9,330,262
Army Corps of Engineers	2	7	0	13,287	0	0	0	4,600	17,887	0	17,887
Defense Logistics	1	5	869	0	0	0	0	0	869	0	869
Defense Stockpile	3	4	0	0	0	0	0	0	0	0	0
Marines	21	51	132,814	338,784	0	0	0	675,534	1,147,131	3,059	1,150,190
Military Academy	2	4	254	0	0	0	0	32,914	33,168	0	33,168
Navy	30	82	322,907	34,008	0	0	0	374,497	731,412	377,957	1,109,369
Department of Energy	23	54	215,239	86,425	0	0	3,880	227,470	533,013	258,872	791,886
Department of Interior	13	14	751	5,225	0	0	0	23,508	29,484	0	29,484
Department of State	1	1	0	250	0	0	0	0	250	0	250
Department of Transportation	9	19	227	2	0	0	0	6,222	6,451	2,527	8,978
Department of Treasury	14	28	148	0	0	0	0	142,796	142,944	29,016	171,960
Department of Veterans Affairs	3	4	3,686	750	0	0	0	0	4,436	0	4,436
Environmental Protection Agency	7	18	5900	64911	0	0	0	1,750,613	1821424	1	1,821,425
Environmental Protection Agency	3	8	0	0	0	0	0	0	0	0	0
EPA Fund-Lead Superfund Sites	4	10	5,900	64,911	0	0	0	1,750,613	1,821,424	1	1,821,425
National Aeronautics and Space Administration	8	15	73,334	0	0	0	4	4,632	77,969	1,825	79,794
Tennessee Valley Authority	26	243	41,275,091	909,336	0	0	0	18,652,015	60,836,442	545,953	61,382,396
US Department of Agriculture	5	7	1	0	0	0	0	450,768	450,769	250	451,019
US Enrichment Corporation	1	6	497,743	73	0	0	0	570	498,386	0	498,386
US General Services Administration	1	1	0	0	0	0	0	0	0	3	3
Total for Federal Facilities	**283**	**935**	**45,036,673**	**5,091,334**	**0**	**0**	**3,884**	**27,128,337**	**77,260,228**	**1,766,920**	**79,027,148**

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

Together, the Department of Defense agencies reported 13.8 million pounds of total releases, including 3.0 million pounds of air emissions, 5.9 million pounds of other on-site land releases (that is, on-site land releases to other than RCRA subtitle C landfills), and 4.0 million pounds of surface water discharges. These DOD facilities also reported almost 928,500 pounds transferred off-site for disposal. Total releases from DOD facilities represented 17.4 percent of all releases by all federal facilities.

Within the DOD, Army releases of 9.3 million pounds consisted of on-site land releases of 3.8 million pounds, surface water discharges of 3.5 million pounds and air emissions of 1.6 million pounds. The Air Force's total of 2.1 million pounds consisted of on-site land releases of 1.0 million pounds and air emissions of 910,900 pounds. The Navy reported 1.1 million pounds of total releases with 322,900 pounds of air emissions and 378,000 pounds of off-site transfers to disposal.

The EPA Fund-Lead Superfund sites reported 1.8 million pounds, primarily as on-site land releases. Over 64,900 pounds were reported as surface water discharges. The on-site land releases were a result of clean-up activities at large, abandoned mining sites.

Waste Management Data, 2001

Quantities of TRI Chemicals in Waste

Federal facilities reported managing 218.5 million pounds of TRI chemicals in production-related waste in 2001, as shown in Table 2-15. The largest quantities of toxic chemicals in waste reported by federal facilities were on- and off-site releases (77.2 million pounds) and on-site treatment (57.4 million pounds). They also reported 44.4 million pounds recycled off-site and 38.7 million pounds recycled on-site.

Tennessee Valley Authority (TVA) facilities accounted for 108.7 million pounds of toxic chemicals in production-related waste managed, or 49.8 percent of the total for all federal facilities in 2001.

Table 2-15: Quantities of TRI Chemicals in Waste by Agency, 2001: Federal Facilities

Federal Agency	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
Department of Defense	38,316,217	3,151,303	88,816	75,900	8,272,951	601,886	13,698,800	64,205,874	187,256
Air Force	24,210	207,501	0	21,585	1,610,394	261,641	2,231,785	4,357,116	42
Army	37,858,376	2,495,004	0	18,025	5,732,319	160,443	9,282,701	55,546,868	131,987
Army Corps of Engineers	0	1,877	0	0	0	371	17,887	20,135	0
Defense Logistics	296,688	0	0	0	0	0	869	297,557	0
Defense Stockpile	0	0	0	0	0	0	0	0	0
Marines	13,733	119,839	88,816	3,900	569,049	7,339	1,106,639	1,909,315	1,614
Military Academy	0	8,770	0	0	0	0	33,168	41,938	0
Navy	123,210	318,313	0	32,390	361,189	172,093	1,025,750	2,032,945	53,613
Department of Energy	258,586	1,200,942	0	36	710,576	10,731	800,181	2,981,052	36,928
Department of Interior	0	0	0	0	0	0	8,545	8,545	0
Department of State	0	3,705	0	0	64,296	0	256	68,257	0
Department of Transportation	0	16,630	0	0	0	21	10,629	27,280	1,539
Department of Treasury	30	39,216,689	0	0	40	0	157,577	39,374,336	19
Department of Veterans Affairs	0	0	0	0	0	0	3,986	3,986	0
Environmental Protection Agency	0	0	0	0	0	318	0	318	1833306
Environmental Protection Agency	0	0	0	0	0	318	0	318	0
EPA Fund-Lead Superfund Sites	0	0	0	0	0	0	0	0	1,833,306
National Aeronautics and Space Administration	113,300	40,351	0	18,840	1,830,768	6,686	79,784	2,089,729	1
Tennessee Valley Authority	0	785,084	0	0	46,473,700	0	61,428,662	108,687,446	0
US Department of Agriculture	0	31	0	0	0	0	493,170	493,201	0
US Enrichment Corporation	0	0	0	0	23,100	0	498,366	521,466	0
US General Services Administration	0	4,500	0	0	0	0	3	4,503	0
Total for Federal Facilities	**38,688,133**	**44,419,236**	**88,816**	**94,776**	**57,375,431**	**619,642**	**77,179,959**	**218,465,992**	**2,059,050**

Note: Data are from Section 8 of Form R

TVA facilities reported 61.4 million pounds released on- and off-site, 79.6 percent of the total quantity released on- and off-site by federal facilities. TVA facilities also reported 46.5 million pounds treated on-site, 81.0 percent of the total treated on-site by federal facilities.

Department of Defense facilities reported the second-largest quantity of toxic chemicals in production-related waste, 64.2 million pounds or 29.4 percent of the total for all federal facilities in 2001. The Army reported a total of 55.5 million pounds with 37.9 million pounds recycled on-site, 9.3 million pounds released on- and off-site, 5.7 million pounds treated on-site and 2.5 million pounds recycled off-site.

The Department of Treasury ranked third among federal agencies for total quantity of toxic chemicals in production-related waste, with 39.4 million pounds, or 18.0 percent of the total for all federal facilities in 2001. Most (39.2 million pounds) of this amount was reported as recycled off-site.

Transfers Off-site for Further Waste Management, including Disposal

Table 2-16 summarizes reporting by federal facilities of transfers off-site for further waste management, including disposal. These transfers totaled 46.2 million pounds in 2001. Much of this amount (43.6 million pounds or 94.4 percent) was transferred off-site to recycling; the category of other off-site transfers to disposal accounted for 1.8 million pounds.

Treasury Department facilities reported the largest total transfers off-site for further waste management, including disposal, in 2001. Over 99.9 percent of the 39.3 million pounds of toxic chemicals transferred by the Treasury Department was sent off-site to recycling.

The Department of Defense facilities reported 4.4 million pounds of chemicals in waste sent off-site for further waste management, including disposal, in 2001. Over 2.7 million pounds of this was sent off-site for recycling, primarily by Army facilities.

In 2001, Tennessee Valley Authority facilities reported 1.3 million pounds sent off-site for further

Table 2-16: TRI Transfers Off-site for Further Waste Management, including Disposal, by Agency, 2001: Federal Facilities

Federal Agency	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs: Metals and Metal Category Compounds Pounds	Transfers to POTWs: Non-metal TRI Chemicals Pounds	Other Off-site Transfers* Pounds	Other Off-site Transfers to Disposal** Pounds	Total Transfers for Further Waste Management, including Disposal Pounds
Department of Defense	2,742,420	76,395	373,465	2,069	217,958	0	987,173	4,399,481
Air Force	207,767	22,033	113,825	564	211,050	0	124,638	679,877
Army	2,085,849	18,021	113,866	715	6,329	0	438,265	2,663,045
Army Corps of Engineers	1,877	0	0	0	371	0	0	2,248
Defense Logistics	0	0	0	0	0	0	0	0
Defense Stockpile	0	0	0	0	0	0	0	0
Marines	119,839	3,900	7,291	0	48	0	46,435	177,513
Military Academy	8,770	0	0	0	0	0	0	8,770
Navy	318,319	32,441	138,483	790	160	0	377,835	868,027
Department of Energy	789,046	36	5,032	28	5,640	0	265,956	1,065,739
Department of Interior	0	0	0	0	0	0	0	0
Department of State	3,705	0	0	0	0	0	0	3,705
Department of Transportation	16,631	0	0	0	0	0	3,682	20,312
Department of Treasury	39,226,123	0	0	1,034	0	0	28,115	39,255,273
Department of Veterans Affairs	0	0	0	0	0	0	0	0
Environmental Protection Agency	63	0	58284	0	0	0	1	58,348
Environmental Protection Agency	63	0	255	0	0	0	0	318
EPA Fund-Lead Superfund Sites	0	0	58,029	0	0	0	1	58,030
National Aeronautics and Space Administration	40,351	18,940	6,657	0	0	0	1,858	67,806
Tennessee Valley Authority	786,759	2	0	0	0	0	546,743	1,333,504
US Department of Agriculture	31	0	0	0	0	0	250	281
US Enrichment Corporation	0	0	0	0	0	0	0	0
US General Services Administration	4,500	0	0	0	0	0	3	4,503
Total for Federal Facilities	**43,609,629**	**95,373**	**443,438**	**3,132**	**223,598**	**0**	**1,833,782**	**46,208,951**

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

waste management, including disposal. These transfers included almost 786,800 pounds sent off-site for recycling and 546,700 pounds were other transfers sent off-site for disposal. Department of Energy facilities reported 1.1 million pounds sent off-site for further waste management, including disposal, with most of it sent off-site for recycling.

Projected Quantities of TRI Chemicals Managed in Waste, 2001-2003

As Table 2-17 shows, the quantity of toxic chemicals in production-related waste for federal facilities is projected to decrease by 5.0 percent between 2001 and 2003, with the largest decline, 4.5 percent, taking place in 2001. As described in **Waste Management** in Chapter 1, on each Form R that it submits, a facility reports actual waste management quantities for the current and prior years and projected quantities for the next two years. The reported change in the quantity of toxic chemicals in production-related waste from 2000 to 2001 was an increase of 3.6 percent.

Tennessee Valley Authority facilities, the agency with the largest quantity of toxic chemicals in production-related waste in 2001, projected almost no reductions. These facilities reported a reduction of 11.0 percent from 2000 to 2001.

Department of Defense facilities, which reported the second largest quantity of toxic chemicals in production-related waste of all federal agencies, projected a decrease of 6.5 percent from 2001 to 2003, after a reported increase of 52.0 percent from 2000 to 2001. This included projected reductions of 16.9 percent by Navy facilities and close to 8 percent by Air Force and Army facilities. Other DOD agencies, however, projected increases, including a 23.2 percent increase by the Military Academy and over 350 percent by Defense Logistics. All DOD agencies showed increases from 2000 to 2001 except for Defense Logistics, which reported a 67.4 percent decrease.

Table 2-17: Prior Year, Current Year and Projected Quantities of TRI Chemicals in Waste by Agency, 2000-2003: Federal Facilities

Federal Agency	Total Production-related Waste Managed							
	Prior Year 2000 Pounds	Current Year 2001 Pounds	Projected 2002 Pounds	Projected 2003 Pounds	Change 2000-2001 Percent	Projected Change 2001-2002 Percent	Projected Change 2002-2003 Percent	Projected Change 2001-2003 Percent
Department of Defense	40,459,317	61,513,201	58,458,386	57,499,312	52.0	-5 0	-1.6	-6 5
Air Force	2,526,110	4,181,779	3,907,670	3,838,145	65 5	-6 6	-1.8	-8 2
Army	35,190,307	53,844,023	50,145,707	49,390,052	53.0	-6.9	-1.5	-8.3
Army Corps of Engineers	14,498	20,135	20,102	20,102	38 9	-0.2	0 0	-0 2
Defense Logistics	911,931	297,557	1,367,895	1,367,895	-67.4	359.7	0.0	359 7
Defense Stockpile	0	0	0	0	--	--	--	--
Marines	161,160	1,428,786	1,424,621	1,422,309	786.6	-0 3	-0.2	-0.5
Military Academy	12,059	34,094	44,000	42,000	182.7	29.1	-4 5	23 2
Navy	1,643,252	1,706,827	1,548,391	1,418,809	3.9	-9.3	-8.4	-16 9
Department of Energy	2,376,000	1,797,943	1,103,390	1,093,493	-24 3	-38 6	-0.9	-39 2
Department of Interior	5,879	4,938	5,122	5,130	-16 0	3.7	0.2	3.9
Department of State	61,729	68,257	68,254	68,254	10 6	-0 004	0 0	-0 004
Department of Transportation	196	0	0	0	-100.0	-100.0	--	-100.0
Department of Treasury	40,644,003	39,185,603	35,574,972	35,572,317	-3 6	-9 2	-0 01	-9 2
Department of Veterans Affairs	4,178	3,986	4,050	4,050	-4.6	1.6	0.0	1.6
Environmental Protection Agency	357	318	15	4	-11 0	-95 3	-73 0	-98 7
Environmental Protection Agency	357	318	15	4	-11.0	-95 3	-73 0	-98.7
EPA Fund-Lead Superfund Sites	0	0	0	0	--	--	--	--
National Aeronautics and Space Administration	243,587	2,084,671	211,211	208,369	755.8	-89.9	-1.3	-90.0
Tennessee Valley Authority	121,294,791	107,916,004	107,890,455	107,882,946	-11.0	-0.02	-0 01	-0 03
US Department of Agriculture	544,313	491,933	400,943	426,400	-9.6	-18 5	6.3	-13.3
US Enrichment Corporation	543,224	520,896	209,020	209,020	-4.1	-59 9	0 0	-59 9
Total for Federal Facilities	**206,177,574**	**213,587,750**	**203,925,818**	**202,969,295**	**3.6**	**-4.5**	**-0.5**	**-5.0**

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

Treasury Department facilities, with the third largest quantity of toxic chemicals in production-related waste, expected a decrease of 9.2 percent from 2001 to 2003, after reporting a decrease of 3.6 percent from 2000 to 2001. The Department of Energy facilities expected to decrease its quantity of toxic chemicals in production-related waste from 2001 to 2003, by 39.2 percent, after reporting a 24.3 percent decrease from 2000 to 2001.

Source Reduction, 2001

In 2001, federal facilities filed 191 forms reporting source reduction activity (see Table 2-18). As noted in **Waste Management** in Chapter 1, source reduction—activity that prevents the generation of waste—is the preferred waste management option.

Department of Defense facilities reported source reduction activity on 119 forms, 23.1 percent of their total Form Rs. Of the DOD agencies, Air Force facilities reported source reduction activities on 39.3 percent of their Form Rs, Navy facilities on 32.5 percent of their Form Rs, Army facilities on 17.7 percent, Army Corps of Engineers facilities on 14.3 percent, and Marines facilities on 9.8 percent.

Tennessee Valley Authority facilities reported source reduction activity on 30 forms, 12.6 percent of their Form Rs. Department of Energy facilities reported such activity on 15.1 percent of their 53 Form Rs, and Department of Treasury facilities on 22.2 percent of their 27 Form Rs.

The most frequently reported source reduction activity (identified on 54 forms, including 42 filed by the Department of Defense facilities) was good operating practices. Raw materials modifications came next, with 49 forms (including 30 by Tennessee Valley Authority facilities and 13 by Department of Defense facilities). Process modifications followed with 21 forms, and then inventory control with 20 forms and cleaning and degreasing with 17 forms. Most forms for these types of source reduction activities were from Department of Defense facilities.

TRI DATA FOR FEDERAL FACILITIES, 2000-2001

Comparisons of TRI data across reporting years are made on the basis of chemicals that were reportable in all years with the same reporting definitions.

Table 2-18: Number of Forms Reporting Source Reduction Activity, by Category and Agency, 2001: Federal Facilities

Federal Agency	Total Form Rs Number	Forms Reporting Source Reduction Activity: Number	Forms Reporting Source Reduction Activity: Percent of All Form Rs Percent	Category of Source Reduction Activity: Good Operating Practices Number	Inventory Control Number	Spill and Leak Prevention Number	Raw Materials Modifications Number	Process Modifications Number	Cleaning and Degreasing Number	Surface Preparation and Finishing Number	Product Modifications Number
Department of Defense	515	119	23 1	42	16	5	13	14	15	11	3
Air Force	107	42	39 3	7	1	0	9	6	11	8	0
Army	260	46	17.7	29	6	4	0	4	1	1	1
Army Corps of Engineers	7	1	14 3	1	0	0	0	0	0	0	0
Defense Logistics	5	0	0 0	0	0	0	0	0	0	0	0
Defense Stockpile	4	0	0 0	0	0	0	0	0	0	0	0
Marines	51	5	9 8	1	1	0	0	0	1	2	0
Military Academy	4	0	0 0	0	0	0	0	0	0	0	0
Navy	77	25	32 5	4	8	1	4	4	2	0	2
Department of Energy	53	8	15 1	3	1	1	2	1	0	0	0
Department of Interior	13	3	23 1	0	0	1	1	0	0	0	1
Department of State	1	0	0 0	0	0	0	0	0	0	0	0
Department of Transportation	11	5	45 5	0	0	2	1	2	0	0	0
Department of Treasury	27	6	22 2	1	0	1	2	2	0	0	0
Department of Veterans Affairs	2	0	0 0	0	0	0	0	0	0	0	0
Environmental Protection Agency	16	3	18 8	3	0	0	0	0	0	0	0
Environmental Protection Agency	6	0	0 0	0	0	0	0	0	0	0	0
EPA Fund-Lead Superfund Sites	10	3	30 0	3	0	0	0	0	0	0	0
National Aeronautics and Space Administration	14	8	57 1	2	0	0	0	2	2	2	0
Tennessee Valley Authority	238	30	12 6	0	0	0	30	0	0	0	0
US Department of Agriculture	7	9	128 6	3	3	3	0	0	0	0	0
US Enrichment Corporation	5	0	0 0	0	0	0	0	0	0	0	0
US General Services Administration	1	0	0 0	0	0	0	0	0	0	0	0
Total for Federal Facilities	**903**	**191**	**21.2**	**54**	**20**	**13**	**49**	**21**	**17**	**13**	**4**

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

This ensures that apparent increases or decreases from one year to another are not the result of changes in the list of TRI chemicals. **Making Year-to-Year Comparisons of TRI Data**, in Chapter 1, explains the issues involved in making multi-year analyses. An understanding of these year to year changes is essential for accurate interpretation of the multi-year data presented in this chapter. Comparisons of the years 2000 and 2001 require that lead and lead compounds (see Chapter 3 for a discussion of these chemicals) be omitted from the data because lower reporting thresholds for these chemicals only became effective with the 2001 reporting year.

On- and Off-site Releases, 2000-2001

Table 2-19 summarizes changes in on- and off-site releases reported by federal facilities between 2000 and 2001. Total releases declined 7.6 percent, a decrease of 6.3 million pounds, primarily due to the net decrease reported by Tennessee Valley Authority facilities.

Tennessee Valley Authority (TVA) facilities reported the largest decrease in on- and off-site releases of any federal agency. TVA facilities reported a decrease of 10.3 million pounds from 2000 to 2001, which represented a decrease of 14.5 percent. Department of Energy facilities reported the second largest decrease with almost 266,700 pounds or 35.7 percent. Defense Logistics, an agency of the Department of Defense, reported a decrease of 79.1 percent from 2000 to 2001. This agency reported these reductions for CFCs and Halons, which are ozone depleters subject to reductions under the Montreal Protocol, an international convention on the reduction and elimination of ozone depleters.

Most other federal agencies reported increases. Army facilities, an agency of the Department of Defense, reported the largest increase with 2.2 million pounds, or a 37.0 percent increase. EPA Fund-Lead Superfund Sites also reported a net increase, of almost 719,000 pounds or a 65.4 percent increase from 2000 to 2001. These releases are related to clean-up activities at hazardous waste sites and may

Table 2-19: TRI Forms and Total Releases by Agency, 2000-2001: Federal Facilities

Federal Agency	Total Forms				Total On- and Off-site Releases			
	2000	2001	Change 2000-2001		2000	2001	Change 2000-2001	
	Number	Number	Number	Percent	Pounds	Pounds	Pounds	Pounds
Department of Defense	271	380	109	40.2	8,122,805	11,751,865	3,629,061	44 7
Air Force	58	87	29	50 0	1,390,392	2,027,824	637,431	45 8
Army	135	189	54	40 0	5,841,450	8,002,810	2,161,361	37 0
Army Corps of Engineers	8	7	-1	-12 5	13,055	17,887	4,832	37 0
Defense Logistics	5	5	0	0 0	4,156	869	-3,287	-79 1
Defense Stockpile	6	4	-2	-33 3	0	0	0	--
Marines	9	31	22	244.4	23,068	714,177	691,109	2996.0
Military Academy	1	2	1	100 0	2,169	25,324	23,155	1067 5
Navy	49	55	6	12.2	848,514	962,974	114,460	13.5
Department of Energy	77	35	-42	-54 5	746,359	479,703	-266,656	-35.7
Department of Interior	5	4	-1	-20.0	16,446	5,915	-10,531	-64 0
Department of State	1	1	0	0 0	250	250	0	0 0
Department of Transportation	10	10	0	0.0	68	0	-68	-99 9
Department of Treasury	14	15	1	7 1	50,770	64,394	13,624	26 8
Department of Veterans Affairs	4	4	0	0.0	4,653	4,436	-217	-4.7
Environmental Protection Agency	11	17	6	54 5	1,099,177	1,818,158	718,981	65 4
Environmental Protection Agency	7	8	1	14.3	0	0	0	--
EPA Fund-Lead Superfund Sites	4	9	5	125 0	1,099,177	1,818,158	718,981	65 4
National Aeronautics and Space Administration	11	10	-1	-9.1	100,028	75,151	-24,877	-24.9
Tennessee Valley Authority	216	226	10	4 6	70,872,123	60,607,159	-10,264,964	-14 5
US Department of Agriculture	5	6	1	20.0	496,271	449,781	-46,490	-9.4
US Enrichment Corporation	7	5	-2	-28 6	507,233	497,793	-9,440	-1 9
Total for Federal Facilities	**632**	**713**	**81**	**12.8**	**82,016,183**	**75,754,605**	**-6,261,578**	**-7.6**

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

vary from year to year. Air Force facilities reported the third largest increase with 637,400 pounds, a 45.8 percent increase.

Quantities of TRI Chemicals in Waste, 2000-2001

Table 2-20 shows changes between 2000 and 2001 in the quantities of toxic chemicals in production-related waste managed as reported by federal facilities. The quantities of toxic chemicals in production-related waste managed by federal facilities rose 1.4 percent, from 210.5 million pounds to 213.6 million pounds, primarily due to the net increase reported by Army facilities. Army, an agency of the Department of Defense, reported the largest increase, of 16.0 million pounds (42.1 percent) from 2000 to 2001.

Facilities of the National Aeronautics and Space Administration reported the second largest increase in the quantity of toxic chemicals in production-related waste of all federal agencies, with an increase of 1.8 million pounds (an increase of over 600 percent) from 2000 to 2001. Marines, an agency of the Department of Defense, reported the third largest increase, with an increase of 1.3 million pounds up from 130,300 pounds in 2000; and Air Force, also a DOD agency, reported an increase of 1.3 million pounds or 44.7 percent.

The Tennessee Valley Authority (TVA) reported the largest decreases in the quantity of toxic chemicals in production-related waste from 2000 to 2001. These facilities reported a net decrease of 12.1 million pounds or 10.1 percent. Department of Energy facilities reported the second largest decreases from 2000 to 2001 in the quantity of toxic chemicals in production-related waste, with a decrease of 2.8 million pounds or 61.1 percent. The third largest decrease was reported by Department of Treasury facilities, with a decrease of 1.4 million pounds or 3.5 percent.

TRI DATA FOR FEDERAL FACILITIES, 1998-2001

Comparisons of TRI data across reporting years are made on the basis of chemicals that were reportable in all years with the same reporting definitions. **Making Year-to-Year Comparisons of TRI Data**, in Chapter 1, explains the issues involved in making

Table 2-20: TRI Total Production-related Waste Managed by Agency, 2000-2001: Federal Facilities

Federal Facilities	Total Production-related Waste Managed			
	2000	2001	Change 2000-2001	
	Pounds	Pounds	Pounds	Percent
Department of Defense	43,833,030	61,513,201	17,680,172	40.3
Air Force	2,889,152	4,181,779	1,292,626	44 7
Army	37,890,889	53,844,023	15,953,134	42.1
Army Corps of Engineers	14,498	20,135	5,637	38 9
Defense Logistics	911,931	297,557	-614,374	-67.4
Defense Stockpile	0	0	0	--
Marines	130,299	1,428,786	1,298,487	996.5
Military Academy	12,059	34,094	22,035	182 7
Navy	1,984,201	1,706,827	-277,373	-14.0
Department of Energy	4,616,144	1,797,943	-2,818,201	-61 1
Department of Interior	24,569	4,938	-19,631	-79.9
Department of State	61,729	68,257	6,528	10 6
Department of Transportation	196	0	-196	-100 0
Department of Treasury	40,624,254	39,185,603	-1,438,651	-3 5
Department of Veterans Affairs	4,178	3,986	-192	-4.6
Environmental Protection Agency	325	318	-7	-2.2
Environmental Protection Agency	325	318	-7	-2.2
EPA Fund-Lead Superfund Sites	0	0	0	--
National Aeronautics and Space Administration	290,950	2,084,671	1,793,721	616.5
Tennessee Valley Authority	120,029,680	107,916,004	-12,113,676	-10 1
US Department of Agriculture	495,858	491,933	-3,925	-0.8
US Enrichment Corporation	555,355	520,896	-34,459	-6.2
Total for Federal Facilities	**210,536,268**	**213,587,750**	**3,051,482**	**1.4**

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

multi-year analyses. An understanding of these year to year changes is essential for accurate interpretation of the multi-year data presented in this chapter. Comparisons of the years 1998, 2000 and 2001 require that PBT chemicals (see Chapter 3 for a discussion of these chemicals), vanadium and vanadium compounds be omitted from the data.

On- and Off-site Releases, 1998 and 2000–2001

Table 2-21 shows total number of forms and total releases on- and off-site as reported by federal facilities for the years 1998, 2000 and 2001. Between 1998 and 2001, total on- and off-site releases increased from 64.1 million pounds to 73.2 million pounds, a rise of 14.3 percent. The change in the latest year, 2000 to 2001 was a decrease of 8.3 percent. Between 1998 and 2001, the number of forms submitted by federal facilities rose from 480 to 612, an increase of 27.5 percent.

Tennessee Valley Authority facilities had the largest total releases on- and off-site in all three of the years 1998, 2000 and 2001. This agency reported an increase from 58.7 million pounds in 1998 to 68.7 million pounds in 2000 followed by a decline of 15.4 percent to 58.1 million pounds in 2001. The overall net change from 1998 to 2001 was a decrease of 1.1 percent.

The Department of Defense agencies reported an overall increase from 3.4 million pounds in 1998 to 11.7 million pounds in 2001, which represented an increase of over 200 percent. Army facilities reported increases from 1.5 million pounds in 1998 to 8.0 million pounds in 2001, and Air Force facilities reported increases from 1.2 million pounds in 1998 to 2.0 million pounds in 2001. Navy facilities reported increases from 622,400 pounds in 1998 to 929,600 pounds in 2001. The DOD's Defense Logistics showed a decrease of 84.3 percent from 1998 to 2001.

Other agencies reporting decreases included the US Department of Agriculture, Department of Energy and the National Aeronautics and Space Administration. The US Department of Agriculture facilities reported a decrease of 22.6 percent from 1998 to 2001. Department of Energy facilities reported a decrease of 14.0 percent and the National Aeronautics and Space Administration facilities had a net decrease of 74.9 percent.

Table 2-21: TRI Forms and Total Releases by Agency, 1998 and 2000-2001: Federal Facilities

Federal Agency	Total Forms					Total On- and Off-site Releases				
	1998 Number	2000 Number	2001 Number	Change 2000-2001 Percent	Change 1998-2001 Percent	1998 Pounds	2000 Pounds	2001 Pounds	Change 2000-2001 Percent	Change 1998-2001 Percent
Department of Defense	208	250	353	41 2	69.7	3,399,689	8,122,542	11,718,238	44.3	244 7
Air Force	55	51	80	56 9	45 5	1,198,509	1,390,353	2,027,803	45 8	69 2
Army	82	124	176	41.9	114.6	1,473,853	5,841,240	8,002,531	37.0	443 0
Army Corps of Engineers	4	8	7	-12.5	75 0	11,506	13,055	17,887	37 0	55 5
Defense Logistics	5	5	5	0.0	0.0	5,545	4,156	869	-79.1	-84.3
Defense Stockpile	0	6	4	-33 3	--	0	0	0	--	--
Marines	18	9	31	244 4	72.2	87,831	23,068	714,177	2996.0	713.1
Military Academy	0	1	2	100 0	--	0	2,169	25,324	1067 5	--
Navy	44	46	48	4.3	9 1	622,445	848,501	929,647	9.6	49.4
Department of Energy	50	57	27	-52.6	-46.0	555,916	742,449	478,066	-35 6	-14 0
Department of Interior	3	5	4	-20.0	33.3	5,221	16,446	5,915	-64.0	13 3
Department of State	0	1	1	0 0	--	0	250	250	0.0	--
Department of Transportation	9	8	8	0.0	-11.1	0	0	0	--	--
Department of Treasury	12	14	15	7.1	25.0	22,570	50,770	64,394	26 8	185 3
Department of Veterans Affairs	3	3	3	0.0	0.0	1,000	1,000	1,000	0.0	0.0
Environmental Protection Agency	2	6	10	66 7	400 0	0	1,099,177	1,818,158	65 4	--
Environmental Protection Agency	2	2	2	0.0	0 0	0	0	0	--	--
EPA Fund-Lead Superfund Sites	0	4	8	100 0	--	0	1,099,177	1,818,158	65 4	--
National Aeronautics and Space Administration	25	11	10	-9.1	-60.0	299,133	100,028	75,151	-24.9	-74.9
Tennessee Valley Authority	156	161	170	5 6	9 0	58,686,250	68,657,230	58,067,445	-15.4	-1 1
US Department of Agriculture	4	5	6	20.0	50.0	580,790	496,271	449,781	-9.4	-22.6
US Enrichment Corporation	8	6	5	-16 7	-37 5	469,092	507,222	497,793	-1 9	6.1
Total for Federal Facilities	**480**	**527**	**612**	**16.1**	**27.5**	**64,019,661**	**79,793,385**	**73,176,191**	**-8.3**	**14.3**

Note: Does not include PBT chemicls, 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

Waste Management Data, 1998 and 2000–2001

As shown in Table 2-22, the quantity of toxic chemicals in production-related waste managed by federal facilities increased from 153.7 million pounds in 1998 to 211.0 million pounds in 2001, an increase of 57.2 million pounds or 37.2 percent. In the most recent time period, 2000 to 2001, the quantity of toxic chemicals in production-related waste increased by 1.3 percent.

The federal facilities with the largest increase in the quantity of toxic chemicals in production-related waste were the Department of Defense's Army facilities, which reported an increase of 33.9 million pounds from 1998 to 2001. This included an increase of 16.0 million pounds from 2000 to 2001. Department of Treasury facilities reported the second largest increase, with an increase of 24.4 million pounds from 1998 to 2001. However, this agency did report a net decrease from 2000 to 2001, of 1.4 million pounds of 3.5 percent.

Other federal agencies reporting increases included Air Force, Marines, and the National Aeronautics and Space Administration. DOD's Air Force facilities reported an increase of 2.5 million pounds, an increase of 147 percent. DOD's Marines facilities had an increase of 1.1 million pounds or 364 percent. The National Aeronautics and Space Administration's facilities increase was 1.3 million pounds or 156 percent.

Federal agencies reporting decreases from 1998 to 2001 included the Tennessee Valley Authority, the Department of Energy and Department of Defense's Defense Logistics. Tennessee Valley Authority facilities reported a decrease of 2.9 million pounds from 1998 to 2001, with a decrease of 12.5 million pounds from 2000 to 2001. Department of Energy facilities had a decrease of 2.4 million pounds or 57.2 percent from 1998 to 2001, and Defense Logistics facilities had a decrease of 1.0 million pounds or 77.2 percent.

Table 2-22: TRI Total Production-related Waste Managed by Agency, 1998 and 2000-2001: Federal Facilities

Federal Agency	Total Production-related Waste Managed						
	1998	2000	2001	Change 2000-2001		Change 1998-2001	
	Pounds	Pounds	Pounds	Pounds	Percent	Pounds	Pounds
Department of Defense	24,626,321	43,832,489	61,479,392	17,646,903	40.3	36,853,071	149 6
Air Force	1,692,687	2,889,113	4,181,758	1,292,645	44 7	2,489,071	147 0
Army	19,967,011	37,890,532	53,843,587	15,953,055	42.1	33,876,576	169.7
Army Corps of Engineers	17,510	14,498	20,135	5,637	38 9	2,625	15 0
Defense Logistics	1,305,830	911,931	297,557	-614,374	-67.4	-1,008,273	-77.2
Defense Stockpile	0	0	0	0	--	0	--
Marines	308,076	130,299	1,428,786	1,298,487	996.5	1,120,710	363.8
Military Academy	0	12,059	34,094	22,035	182 7	34,094	--
Navy	1,335,207	1,984,057	1,673,475	-310,582	-15.7	338,268	25.3
Department of Energy	4,133,670	4,602,010	1,768,567	-2,833,443	-61.6	-2,365,103	-57.2
Department of Interior	5,130	24,569	4,938	-19,631	-79.9	-192	-3.7
Department of State	0	61,729	68,257	6,528	10.6	68,257	--
Department of Transportation	0	0	0	0	--	0	--
Department of Treasury	14,828,948	40,624,254	39,185,603	-1,438,651	-3.5	24,356,655	164 3
Department of Veterans Affairs	825	525	550	25	4.8	-275	-33.3
Environmental Protection Agency	0	0	0	0	--	0	--
Environmental Protection Agency	0	0	0	0	--	0	--
EPA Fund-Lead Superfund Sites	0	0	0	0	--	0	--
National Aeronautics and Space Administration	814,600	290,950	2,084,671	1,793,721	616 5	1,270,071	155 9
Tennessee Valley Authority	108,233,323	117,826,564	105,374,019	-12,452,545	-10 6	-2,859,304	-2 6
US Department of Agriculture	580,550	495,858	491,933	-3,925	-0.8	-88,617	-15.3
US Enrichment Corporation	517,796	555,344	520,896	-34,448	-6 2	3,100	0.6
Total for Federal Facilities	**153,741,163**	**208,314,292**	**210,978,826**	**2,664,533**	**1.3**	**57,237,663**	**37.2**

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

Chapter 3
2001 Toxics Release Inventory Data for PBT Chemicals

Chapter 3
2001 Toxics Release Inventory Data for PBT Chemicals

INTRODUCTION

For the reporting year 2000, TRI was expanded to include certain new persistent bioaccumulative toxic (PBT) chemicals. In addition, 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 compound category. Two of the chemicals were added to the Polycyclic Aromatic Compounds (PACs) category. The rule also lowered reporting thresholds for 15 PBT chemicals and three PBT chemical categories (see Box 3-1).

Reporting thresholds for lead and lead compounds were lowered in a second 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 contained in stainless steel, brass, or bronze alloys.

This chapter of the *2001 Toxics Release Inventory Public Data Release Report* presents TRI data for the PBT chemicals for 2001 and for 2000-2001.

Prior to the changes for the PBT chemicals, the reporting threshold for all chemicals was 25,000 pounds for manufacturing or processing the chemical and 10,000 pounds if otherwise used. Because PBT chemicals persist and bioaccumulate in the environment, 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 a concern. Therefore, EPA established lower thresholds for these chemicals. For those chemicals that are persistent and bioaccumulative, 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 dioxin and dioxin-like compounds 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 grams, so that reporting would result.

This chapter provides an overview of the TRI data for each group of PBT chemicals (see Box 3-1). Data analyses in this chapter begin with summary tables that compare release and other waste management data for PBT chemicals. The chapter then presents separate sections on each PBT chemical group and its TRI data. Data for 2001 are presented for all PBT chemicals. Data for 2000 to 2001 are presented for all of the PBT chemicals except lead and lead compounds. Data for 2000 cannot be compared to that for 2001 for lead and lead compounds because of the change in reporting thresholds.

While the expansion of information on PBT chemical releases and other waste management activities through the TRI provides an invaluable source of environmental data, it is limited. TRI does not include all industrial sources or other sources of releases, for example agricultural applications of pesticides. Although these chemicals are known to exist in the environment for long periods of time, TRI data do not supply information on exposure and risk, but rather on releases that take place in a given calendar year. Chapter 1 explains the types of release and other waste management activities, and provides important information on factors and limitations to consider when using TRI data. In addition, more details on each PBT chemical, their sources, chemical characteristics, health and envi-

Box 3-1: PBT Chemicals on TRI list

CAS Number	PBT Chemicals	Reporting Threshold
—	**Dioxin and dioxin-like compounds category**	0.1 grams
	(including the following chemicals)	
67562-39-4	1,2,3,4,6,7,8 Heptachlorodibenzofuran	
55673-89-7	1,2,3,4,7,8,9-Heptachlorodibenzofuran	
70648-26-9	1,2,3,4,7,8-Hexachlorodibenzofuran	
57117-44-9	1,2,3,6,7,8-Hexachlorodibenzofuran	
72918-21-9	1,2,3,7,8,9-Hexachlorodibenzofuran	
60851-34-5	2,3,4,6,7,8-Hexachlorodibenzofuran	
39227-28-6	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	
57653-85-7	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	
19408-74-3	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	
35822-46-9	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	
39001-02-0	1,2,3,4,6,7,8,9-Octachlorodibenzofuran	
3268-87-9	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	
57117-41-6	1,2,3,7,8-Pentachlorodibenzofuran	
57117-31-4	2,3,4,7,8-Pentachlorodibenzofuran	
40321-76-4	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	
51207-31-9	2,3,7,8-Tetrachlorodibenzofuran	
1746-01-6	2,3,7,8-Tetrachlorodibenzo-p-dioxin	
		(pounds)
	Lead and Lead compounds category	
	(including the following chemicals)	
7439-92-1	Lead	100
—	Lead compounds	100
	Mercury and Mercury compounds category	
	(including the following chemicals)	
7439-97-6	Mercury	10
—	Mercury compounds	10

Box 3-1: PBT Chemicals on TRI list (continued)

CAS Number	PBT Chemicals	Reporting Threshold
—	**Polycyclic aromatic compounds (PACs)**	
	(including the following chemicals)	
191-24-2	Benzo(g,h,i)perylene	10
—	Polycyclic aromatic compounds category	100
	(including the following chemicals)	
56-55-3	Benzo(a)anthracene	
205-99-2	Benzo(b)fluoranthene	
205-82-3	Benzo(j)fluoranthene	
207-08-9	Benzo(k)fluoranthene	
206-44-0	Benzo(j,k)fluorene	
189-55-9	Benzo(r,s,t)pentaphene	
218-01-9	Benzo(a)phenanthrene	
50-32-8	Benzo(a)pyrene	
226-36-8	Dibenzo(a,h)acridine	
224-42-0	Dibenzo(a,j)acridine	
53-70-3	Dibenzo(a,h)anthracene	
194-59-2	7H-Dibenzo(c,g)carbazole	
5385-75-1	Dibenzo(a,e)fluoranthene	
192-65-4	Dibenzo(a,e)pyrene	
189-64-0	Dibenzo(a,h)pyrene	
191-30-0	Dibenzo(a,l)pyrene	
57-97-6	7,12-Dimethylbenz(a)anthracene	
193-39-5	Indeno[1,2,3-cd]pyrene	
56-49-5	3-Methylcholanthrene	
3697-24-3	5-Methylchrysene	
5522-43-0	1-Nitropyrene	
1336-36-3	**Polychlorinated biphenyls (PCBs)**	10
	Pesticides	
309-00-2	Aldrin	100
57-74-9	Chlordane	10
76-44-8	Heptachlor	10
465-73-6	Isodrin	10
72-43-5	Methoxychlor	100
40487-42-1	Pendimethalin	100
8001-35-2	Toxaphene	10
1582-09-8	Trifluralin	100
	Other PBT Chemicals	
118-74-1	Hexachlorobenzene	10
29082-74-4	Octachlorostyrene	10
608-93-5	Pentachlorobenzene	10
79-94-7	Tetrabromobisphenol A	100

ronmental effects and efforts being undertaken to reduce pollution can be found in the *2000 Toxics Release Inventory Public Data Release Report* (EPA 260-R-02-003). Because lead and lead compounds fall under the lower reporting thresholds for reporting year 2001, this chapter presents information in a separate section for lead and lead compounds.

Chemical Characteristics

Persistence

A chemical's persistence refers to the length of time the chemical can exist in the environment before being destroyed (i.e., transformed into another chemical species) by natural processes. The environmental media for which persistence is measured or estimated include air, water, soil, and sediment.

A distinction is made between persistence in a single medium (air, water, soil, sediment) and overall environmental persistence. Persistence in an individual medium is controlled by transport of the chemical to other media, as well as transformation to other chemical species. Persistence in the environment as a whole is a distinct concept based on the observations that the environment behaves as a set of interconnected media, and that a chemical substance released to the environment will become distributed in these media in accordance with the chemical's intrinsic (physical/chemical) properties and reactivity.

A common measure of persistence in an environmental medium is a chemical's half-life, or the amount of time necessary for half of the chemical present to be eliminated from the medium. If a toxic chemical meets any one of the media-specific criteria, it is considered to be persistent. However, in the PBT chemicals rulemaking EPA did not classify chemicals as PBT chemicals based solely on the air criterion.

Bioaccumulation

Bioaccumulation is a general term that is used to describe the process by which organisms may accumulate chemical substances in their bodies. Bioaccumulation can occur in plants and animals, including humans.

EPA has defined bioaccumulation as the net accumulation of a substance by an organism as a result of uptake from all environmental sources. The nondietary accumulation of chemicals in aquatic organisms is referred to as bioconcentration. EPA has defined bioconcentration as the net accumulation of a substance by an aquatic organism as a result of uptake directly from the ambient water through gill membranes or other external body surfaces.

A chemical's potential to bioaccumulate can be quantified by measuring or predicting the chemical's bioaccumulation factor (BAF). The BAF is the ratio of a substance's concentration in tissue of an aquatic organism to its concentration in the ambient water, in situations where both the organism and its food are exposed and the ratio does not change substantially over time. A chemical's potential to bioaccumulate can also be quantified by measuring or predicting the chemical's bioconcentration factor (BCF). The BCF is the ratio of a substance's concentration in tissue of an aquatic organism to its concentration in the ambient water, in situations where the organism is exposed through water only and the ratio does not change substantially over time. Because BAFs consider the uptake of chemicals from all routes of exposure they are considered better predictors of the accumulation of chemicals within fish than BCFs, which only consider uptake of chemicals directly from water.

Toxicity

EPCRA section 313 provides toxicity criteria at section 313(d)(2) to be used to determine whether a chemical should be added or deleted from the EPCRA section 313 list of toxic chemicals. All of the chemicals listed as PBT chemicals, including dioxin and dioxin-like compounds, were either added based on these criteria or were on the initial EPCRA section 313 list provided to EPA by Congress.

TRI DATA FOR PBT CHEMICALS, 2001

As shown in Table 3-1, 15,794 forms were submitted for PBT chemicals in 2001. Over half of these forms were for lead and lead compounds. Almost one-quarter of the forms were for polycyclic aromatic compounds.

On- and Off-site Releases, 2001

In 2001, TRI releases for all PBT chemicals totaled 454.4 million pounds, of which lead and lead compounds accounted for 443.0 million pounds, or 97.5 percent of total releases for all PBT chemicals (see Table 3-1). Over 85 percent of the releases of PBT chemicals were released on-site to land and 12.7 percent were off-site releases (off-site transfers to disposal).

Lead and lead compounds accounted for 360.8 million pounds of the 365.8 million pounds of other on-site land releases (that is, other than to RCRA subtitle C landfills) accounting for 98.6 percent of such releases. Lead and lead compounds accounted for 55.3 million pounds of the 57.8 million pounds of off-site releases (95.6 percent). Lead and lead compounds also accounted for 54.0 percent and polycyclic aromatic compounds for 38.9 percent of the 3.0 million pounds of air emissions for all PBT chemicals.

Table 3-1: TRI On-site and Off-site Releases, PBT Chemicals, 2001

			On-site Releases							Off-site	
					Underground Injection		On-site Land Releases			Releases	Total
CAS Number	Chemical	Total Forms	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	On- and Off-site Releases
		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

The various PBT chemicals were generally released in different ways in 2001. Over 60 percent of dioxin and dioxin-like compounds were off-site releases (off-site transfers to disposal). Over 80 percent of lead and lead compounds and over 90 percent of mercury and mercury compounds were released on-site to land in sites other than RCRA subtitle C landfills. Polycyclic aromatic compounds were either transferred off-site to disposal (54.3 percent) or released to air (39.4 percent). Practically all of the polychlorinated biphenyls (90.4 percent) were released to on-site RCRA subtitle C landfills. For the group of pesticides, 45.7 percent was transferred off-site to disposal and 34.4 percent was released on-site to land in sites other than RCRA landfills. For the four other PBT chemicals, 69.6 percent of total releases of this group was transferred off-site to disposal.

In 2001, facilities in Alaska reported the largest total on- and off-site releases of PBT chemicals (see Table 3-2). They reported a total of 145.2 million pounds, or 32.0 percent of total releases for all PBT chemicals. Utah accounted for 95.5 million pounds, or 21.0 percent of the total. Facilities in Nevada reported the third largest amount, 42.3 million pounds or 9.3 percent. Missouri accounted for 32.0 million pounds (7.0 percent).

Each of the four states with the largest releases had most of their releases of PBT chemicals as on-site land releases. Such releases in Alaska were 139.2 million pounds or 95.9 percent of the state's total. Utah's on-site land releases were 99.8 percent of the state's total releases, Nevada's were 99.9 percent and Missouri's were 87.5 percent.

New Jersey facilities reported the largest amount of off-site releases (transfers to disposal), with 18.8 million pounds or 32.5 percent of total off-site releases of PBT chemicals in 2001. Off-site releases represented 99.7 percent of total releases of PBT chemicals in New Jersey.

In 2001, metal mining facilities reported the largest total on- and off-site releases of PBT chemicals (see Table 3-3). This industry reported 339.7 million pounds or 74.8 percent of total releases of PBT chemicals. The primary metals industry reported the second largest total releases, with 45.6 million pounds or 10.0 percent of the total for PBT chemicals. The hazardous waste/solvent recovery industries represented another 5.7 percent (26.1 million pounds) of total releases.

The metal mining industry reported almost all of their releases of PBT chemicals in 2001 as on-site releases to land sites other than to RCRA subtitle C landfills, with 333.6 million pounds of such releases or 98.2 percent of the industry's total. The primary metals industry reported the largest off-site releases (transfers to disposal) with 26.1 million pounds, which represented 57.3 percent of the industry's total releases of PBT chemicals. The primary metals industry also had the largest air emissions of any industry sector, with 1.2 million pounds or 40.4 percent of total air emissions of PBT chemicals in 2001. The hazardous waste/solvent recovery industries reported 20.4 million pounds of on-site land releases to RCRA subtitle C landfills, which represented 96.9 percent of all such releases of PBT chemicals.

Waste Management Data, 2001

Quantities of TRI Chemicals in Waste

The total quantity of PBT chemicals managed in production-related waste in 2001 was 1.28 billion pounds, of which lead and lead compounds accounted for 1.23 billion pounds, or 96.4 percent (see Table 3-4). Polycyclic aromatic compounds totaled 25.0 million pounds of production-related waste managed, or 2.0 percent of the total for PBT chemicals.

Almost 43 percent of all PBT chemicals in production-related waste was recycled on-site (546.6 million pounds). Another 34.4 percent was released on- and off-site, and 20.3 percent was recycled off-site.

Lead and lead compounds accounted for 543.7 million pounds (99.5 percent) of the on-site recycling of PBT chemicals, 428.6 million pounds (97.4 percent) of the quantity released on- and off-site, and

Table 3-2: TRI On-site and Off-site Releases by State, PBT Chemicals, 2001

		On-site Releases							Off-site Releases	
				Underground Injection		On-site Land Releases				
State	Total Forms	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
Alabama	422	66,826.07	6,973.12	0.00	6,912 00	1,198,983.00	988,190 09	2,267,884.28	467,746.84	2,735,631 12
Alaska	47	13,202 95	146 64	0 00	6,007,867 00	0 00	139,196,159 40	145,217,375 99	1,196 70	145,218,572 69
American Samoa	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 00
Arizona	183	34,640 02	7 01	0 00	0 00	1,736 45	11,209,100 44	11,245,483 92	67,941 63	11,313,425 54
Arkansas	212	86,652 84	1,789 34	0.00	0.00	38,013.70	291,771.57	418,227 45	1,134,099 67	1,552,327.12
California	944	42,990 35	1,298 54	0 00	9 01	5,982,733 85	580,404 15	6,607,435 91	230,816 86	6,838,252 76
Colorado	197	34,016.61	294.50	0.00	0.00	18,137 20	3,876,931.29	3,929,379.60	93,746.48	4,023,126 07
Connecticut	331	21,386 73	607 96	0 00	0 00	0.00	1,350 60	23,345 29	738,723.09	762,068 38
Delaware	64	5,415.08	3,659 34	0 00	0.00	0.00	21,852.08	30,926.50	60,773.06	91,699 56
District of Columbia	6	0 10	0 00	0 00	0 00	0 00	0 00	0 10	958 60	958 70
Florida	473	41,869 24	1,450.24	0.00	0.00	18,260.60	437,565 88	499,145.96	329,178.45	828,324 41
Georgia	386	40,173 15	2,564 59	0 00	0 01	2,275 00	601,223 92	646,236.67	85,030 22	731,266 89
Guam	17	803.65	1.00	0.00	0.00	3.00	5,519.00	6,326.65	0.00	6,326 65
Hawaii	71	6,506 14	277 10	0 00	6 58	0.00	77,022 42	83,812 24	5,288 22	89,100 47
Idaho	61	2,922.21	1,322 39	0.00	0.00	3,509,759.09	3,444,177 95	6,958,181.64	71,774 58	7,029,956.22
Illinois	636	73,382.10	5,510 71	0 00	0 00	1,502,755 10	425,690 34	2,007,338 24	818,550 77	2,825,889.01
Indiana	600	92,728.02	256,492.80	1,300.40	139.90	1,006.00	1,009,721.87	1,361,388.99	3,381,285.65	4,742,674.65
Iowa	242	60,460 95	2,087 01	0 00	0 00	0 00	146,881 87	209,429 82	223,920 33	433,350 15
Kansas	174	36,795 56	50.36	20.14	0.00	0.00	122,094.80	158,960.87	45,407.70	204,368 57
Kentucky	342	114,530 55	8,556 80	0 00	333 50	0 00	1,069,746 15	1,193,167 01	170,931.08	1,364,098 09
Louisiana	316	130,964.86	19,371.84	116.41	0.00	265,607.02	409,903.17	825,963 30	332,631.46	1,158,594.76
Maine	161	6,368 77	1,884.50	0.00	0.00	0 00	6,699 10	14,952 37	297,492 75	312,445 12
Maryland	173	29,931.44	1,130.73	0.00	245.03	0.00	118,761.61	150,068.81	90,915.09	240,983.90
Massachusetts	559	36,155 86	33 31	0 00	0 00	452 02	5,604 43	42,245.62	303,198 67	345,444 29
Michigan	519	87,162 53	5,190.85	2.00	0 00	1,688,858.89	238,604.43	2,019,818.70	1,179,806.05	3,199,624 75
Minnesota	285	24,879 05	807 82	0.00	0 00	0 00	184,054 69	209,741 56	478,554 84	688,296 40
Mississippi	215	16,104.28	1,499.51	189,052.90	0.00	4,312 00	141,954 16	352,922.84	62,917.51	415,840.35
Missouri	333	453,510 13	3,814 01	0 00	0 00	44,271.93	27,919,564 42	28,421,160.49	3,552,753 28	31,973,913 77
Montana	69	11,461.91	382.64	0.00	10,831.00	0.00	14,146,015.10	14,168,690.65	749,182.89	14,917,873.55
Nebraska	109	16,532 33	100 82	0 00	0 00	0.00	84,975 23	101,608.38	47,611 78	149,220.16
Nevada	113	19,588.54	49 00	0.00	0 20	1,344,010.00	40,920,010.20	42,283,657.94	10,546.01	42,294,203.96
New Hampshire	134	615 64	222 12	0 00	0 00	0.00	417 70	1,255 46	50,143 77	51,399 23
New Jersey	362	11,120.64	1,146.05	0.00	1.00	6,242 60	40,933.14	59,443 44	18,776,487.82	18,835,931.25
New Mexico	73	5,678 56	50 70	0 00	0 00	0 00	7,144,392 36	7,150,121 62	39,535 81	7,189,657 43
New York	601	55,829 12	18,146.46	0.00	0 00	7,587.99	130,344 98	211,908.55	367,904.11	579,812.66
North Carolina	542	57,533 43	2,514.90	0.00	0 00	250 00	574,033 96	634,332 29	403,487.75	1,037,820 04
North Dakota	52	10,899 32	452.00	0.00	0.00	0.00	106,042.78	117,394.10	76,802.07	194,196.17
Northern Marianas	9	3 69	0 00	0.00	0 00	0 00	2 10	5 79	0 00	5 79
Ohio	956	518,432.13	6,429.11	15,150.00	0 00	2,243,515.61	812,419.25	3,595,946.09	3,422,815 72	7,018,761.81
Oklahoma	180	18,210 63	309 52	562 00	0 00	484,831 02	33,094 52	537,007 69	169,605.11	706,612 80
Oregon	194	11,335.87	3,176 45	0.00	0 00	1,459,146 58	132,276.57	1,605,935.46	41,983.79	1,647,919.25
Pennsylvania	891	139,904 49	6,528 96	0 00	0 00	243,930 60	911,187 66	1,301,551 71	3,452,147 53	4,753,699 24
Puerto Rico	109	11,132.99	452 30	0.00	0 00	0.00	8,669.50	20,254 79	6,654.84	26,909.64
Rhode Island	110	1,455 32	19 09	0 00	0 00	0 00	0 00	1,474 41	12,149 73	13,624 14
South Carolina	374	120,310 07	1,904 96	0.00	0.00	1,579 00	318,816.16	442,610 19	424,358 34	866,968.54
South Dakota	57	1,823 92	632 54	0 00	8,700 00	0 00	2,986,750 10	2,997,906 56	1,864 03	2,999,770 59
Tennessee	377	71,307.85	6,486.67	0.00	0 00	1,149.00	6,271,641.16	6,350,584.68	779,207.28	7,129,791.96
Texas	962	175,789 44	9,892 60	1,816 12	0 20	358,380 71	1,277,742 02	1,823,621 09	12,666,561 64	14,490,182 73
Utah	140	14,199 31	518 20	0.00	0 00	629,368.00	94,675,720 32	95,319,805.83	136,957.35	95,456,763 18
Vermont	38	580 20	2 00	0 00	0 00	178 00	0 30	760 50	22,721 86	23,482.36
Virgin Islands	18	3,318.03	1.00	0.00	0 00	0.00	103.00	3,422.03	534.00	3,956.03
Virginia	384	56,986 54	5,804 73	0 00	0 00	826 00	368,808 04	432,425.31	571,700 24	1,004,125 55
Washington	277	32,081.74	7,233 01	0.00	6.10	4,731.93	240,891 89	284,944.67	521,143.97	806,088.64
West Virginia	172	43,859 04	28,224 00	0 00	0 00	105 00	1,866,687 55	1,938,875 59	491,693 38	2,430,568 97
Wisconsin	459	47,034.36	4,020 14	0.00	0 00	3,992.95	79,128.64	134,176.09	356,422.37	490,598.46
Wyoming	62	6,960 64	1,525 33	0 00	0 00	0 00	143,088 04	151,574.01	18,277 07	169,851 08
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

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

			On-site Releases							Off-site Releases	
					Underground Injection		On-site Land Releases				
SIC Code	Industry	Total Forms	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
10	Metal Mining	154	156,739 05	3,947 48	0 00	6,027,398 20	0 00	333,552,112 25	339,740,196 98	9,741 35	339,749,938 33
12	Coal Mining	118	114 06	26,256 83	0 00	7,296 93	0 00	1,208,500 67	1,242,168 49	10,830 00	1,252,998 49
20	Food	381	125,700 61	624 00	0 00	0 00	3 50	35,852 21	162,180 32	26,866 03	189,046 35
21	Tobacco	11	260 50	18 10	0 00	0 00	0 00	0 00	278 60	7,461 50	7,740 10
22	Textiles	211	48,548 31	13 22	0 00	0 00	0 00	2,350.57	50,912 10	34,131 71	85,043 81
23	Apparel	2	0 00	0 00	0 00	0 00	0 00	75 00	75 00	0 00	75 00
24	Lumber	599	30,307 19	375 01	0 00	0 00	0 01	38,522 06	69,204 27	32,559 41	101,763 68
25	Furniture	113	4,160 99	476 10	0 00	0 00	0 00	26 69	4,663 78	14,036 57	18,700 35
26	Paper	835	100,872 81	31,318 41	0 00	0 00	9.08	274,065.33	406,265.63	129,263.86	535,529 49
27	Printing	48	5,517 68	0 00	0 00	0 00	0 00	408 00	5,925 68	32,680 22	38,605 90
28	Chemicals	1,266	164,750 87	17,634 83	189,080 95	1 20	10,249 25	1,711,934 29	2,093,651 38	19,412,350 27	21,506,001 65
29	Petroleum	934	184,933 37	9,109 54	76 00	11 11	38 84	13,640 92	207,809 78	295,326 62	503,136 40
30	Plastics	458	36,413 43	253 28	0 00	0 00	7,394 00	7,447 30	51,508 00	365,421 79	416,929.79
31	Leather	7	26 16	0 00	0 00	0 00	0 00	0 00	26 16	0 00	26 16
32	Stone/Clay/Glass	932	197,412 22	479 75	0 00	339 60	400 70	748,917 36	947,549 62	1,330,184 54	2,277,734 16
33	Primary Metals	1,447	1 220,723 60	271,845 20	2,626 40	0 00	507,932 96	17,445,756 78	19,448,884 95	26,102,029 19	45,550,914 14
34	Fabricated Metals	999	30,316 59	2,143 94	0 00	0 00	54,853 00	36,980 43	124,293 96	494,188.57	618,482 53
35	Machinery	337	37,734 79	30 04	0 00	0 00	3 98	3,115 82	40,884 63	81,284 56	122,169 19
36	Electrical Equip	1,367	93,615 67	2,149 87	0 00	0 00	4,213 36	41,987 02	141,965 92	1,497,409 47	1,639,375 39
37	Transportation Equip	503	51,552 88	908 61	0 00	0 00	204 78	2,835 36	55,501 63	547,492 07	602,993 70
38	Measure/Photo	216	21,286 32	1,059 34	0 00	0 00	252 93	577 15	23,175 74	46,233 75	69,409 49
39	Miscellaneous	101	2,807 18	62 97	0 00	0 00	26 00	390 00	3,286 15	27,834 34	31,120 49
–	Multiple codes 20-39	772	110,565 88	12,074 79	0 00	0 01	2,761 75	276,792 34	402,194 77	675,641 70	1,077,836 47
--	No codes 20-39	284	61,179 80	1,690 79	0 00	0 00	3,883 60	2,039,858 44	2,106,612 63	331,269 50	2,437,882 13
491/493	Electric Utilities	2,227	309,270 92	50,011 20	0 00	4 48	50,895 40	7,448,657 20	7,858,839 20	1,624,260.83	9,483,100 03
5169	Chemical Wholesale Distributors	23	23 41	0 00	0 00	0 00	5 00	0 00	28 41	4,310 18	4,338 59
5171	Petroleum Terminals/Bulk Storage	954	14,758 48	194 42	0 00	0 00	3 00	1,277 43	16,233 33	8,083 49	24,316 82
7389/4953	Hazardous Waste/Solvent Recovery	495	14,772 24	369 60	16,236 62	0 00	20,423,858 71	912,661 51	21,367,898 67	4,703,248 33	26,071,147 00
	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.

258.8 million pounds (99.6 percent) of off-site recycling of PBT chemicals in 2001.

Polycyclic aromatic compounds accounted for 95.7 percent (10.4 million pounds) of energy recovery on-site and 40.9 percent (8.2 million pounds) of on-site treatment of PBT chemicals in 2001.

In 2001, facilities in Missouri reported the largest quantities of PBT chemicals in total production-related waste managed (see Table 3-5). Missouri accounted for 14.9 percent (190.3 million pounds) of the total quantity of PBT chemicals managed in production-related waste. Minnesota, the state with the second largest production-related waste of PBT chemicals, reported 148.8 million pounds or 11.6 percent, and Alaska, with the third largest amount, reported 145.0 million pounds or 11.3 percent of total PBT chemicals in production-related waste.

Both Missouri and Minnesota reported most of PBT chemicals contained in production-related waste as recycled on-site. Missouri had 141.2 million pounds recycled on-site, or 74.2 percent of that state's total production-related waste of PBT chemicals. Minnesota reported 145.1 million pounds (97.5 percent of its total) as recycled on-site. Alaska, on the other hand, reported 144.9 million pounds as released on- and off-site. This represented 99.3 percent of Alaska's PBT chemicals in production-related waste and 32.9 percent of total quantity of PBT chemicals released on- and off-site in 2001.

In 2001, the primary metals industry reported the largest quantity of PBT chemicals in production-related waste (see Table 3-6). This industry reported 446.2 million pounds or 34.9 percent of the total PBT chemicals in production related-waste. The

Table 3-4: Quantities of TRI Chemicals in Waste, PBT Chemicals, 2001

CAS Number	Chemical	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On- and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-production-related Waste Managed 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

metal mining industry reported the second largest amount, with 340.2 million pounds or 26.6 percent of the total for PBT chemicals. The electrical equipment industry reported the third largest amount, with 283.4 million pounds or 22.2 percent of the total. These three industries accounted for almost 84 percent of the PBT chemicals in production-related waste in 2001.

The primary metals industry reported 82.7 percent (368.9 million pounds) of its PBT chemicals managed in production-related waste as recycled on-site. This represented 67.5 percent of all PBT chemicals recycled on-site in 2001. The metal mining industry released on- and off-site 336.6 million pounds, accounting for 99.0 percent of its PBT chemicals in production-related waste. This represented 76.5 percent of all PBT chemicals released on- and off-site in 2001. The electrical equipment industry sent 190.9 million pounds off-site to recycling. This accounted for 67.4 percent of its PBT chemicals in production-related waste and for 73.5 percent of all off-site recycling of PBT chemicals in 2001.

Transfers Off-site for Further Waste Management, including Disposal

As shown in Table 3-7, transfers off-site for further waste management, including disposal, totaled 324.8 million pounds for PBT chemicals in 2001. Lead and lead compounds accounted for 320.2 million pounds of the total (98.6 percent).

Almost 79 percent of all transfers for further waste management, including disposal, of PBT chemicals was sent off-site for recycling (256.6 million

Table 3-5: Quantities of TRI Chemicals in Waste by State, PBT Chemicals, 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	16,909,585 69	4,223,987 87	0 00	2,107.62	32,183 89	86,707 69	2,972,190 68	24,226,763.43	6,755.99
Alaska	34 10	0 00	0 00	98,000 20	1,013 78	1 30	144,915,090 10	145,014,139 48	31 10
American Samoa	0.00	0.00	128.50	0.00	0 00	0 00	0 00	128 50	0.00
Arizona	2,242,815 07	929,143 58	106,979 90	383 00	539,677 08	29,683 50	11,277,287 90	15,125,970 03	1,935 70
Arkansas	1,920,287 75	4,940,430 54	2,972.00	12,172 20	1,085,102 61	74,536 64	2,643,508 92	10,679,010.65	139,624.14
California	13,431,956 74	16,990,183 86	86,587 00	2,190 20	1,174,464 89	140,811 65	7,282,139 51	39,108,333 86	32,370 74
Colorado	73,447.20	3,466,955 64	0 00	8 70	135,814.26	1,583 00	4,092,706 37	7,770,515 17	7,067.75
Connecticut	9,326 92	865,278 45	3,234 10	10 10	12,070 43	13,812 50	759,164 71	1,662,897 20	69,074 91
Delaware	7,800.00	4,570,953 92	210 00	0 00	400 00	0 03	93,038.05	4,672,402 00	118 00
District of Columbia	30 00	4,500 00	0 00	0 00	3 00	0 00	335 00	4,868 00	0 00
Florida	48,579 00	7,046,302 01	22,627.40	146 61	384 07	6,292 96	766,270.24	7,890,602 29	17,692 49
Georgia	1,365,686 45	11,039,862 75	20,714 00	37 76	95 33	9,216 69	743,017 37	13,178,630 35	5,149 11
Guam	0 00	0 00	0.00	0.00	0.00	3 00	6,309 65	6,312 65	17.00
Hawaii	115 00	16,844 28	0 00	0 00	0 00	15 01	132,174 50	149,148 79	1 41
Idaho	4,332 00	453,122 02	0 01	0 00	0 00	1 00	7,049,050.55	7,506,505 58	3,821 59
Illinois	361,593 68	10,509,014 04	0 00	58,445 04	571,932 50	41,388 02	3,518,383 41	15,060,756 69	18,611 11
Indiana	12,633,329 73	11,411,473 63	22,962 00	1,368 80	355,235 08	30,690 52	4,731,180 82	29,186,240 57	46,302 46
Iowa	12,824,054 27	19,075,855 48	6,773 00	738 70	20,140 00	76,798 70	1,010,689 26	33,015,049 41	1,888 55
Kansas	31,544,422.29	8,088,750 75	2,100 00	22.00	85.00	27,968.11	247,587 28	39,910,935.43	12,802 00
Kentucky	5,419,674 90	8,402,827 00	183,938 00	5,212 00	554,762 30	86,480 24	1,349,503 87	16,002,398 31	2,110 33
Louisiana	21,223,326.65	9,339,270 56	1,521,350 00	20,261 00	3,810,219 65	45,023 04	1,180,419 60	37,139,870 50	11,749.39
Maine	0 00	35,541 88	471,782 00	1,036 70	1,094 00	1,215 10	31,592 81	542,262 49	4,047 30
Maryland	338,038 78	290,462.30	611,450.20	0 00	12,483 20	1,789 67	220,901.05	1,475,125 21	11 00
Massachusetts	8,909 92	642,540 96	32,177 22	1,026 12	17,928 00	115,696 21	333,281 02	1,151,559 45	1,251 11
Michigan	1,099,699 40	2,269,234 09	3,073 80	428 30	1,922,063 73	2,483.93	3,172,626 21	8,469,609.47	75.05
Minnesota	145,095,364 75	2,911,163 28	103,081 00	1,021 70	198 33	119 20	658,151 13	148,769,099 38	36,573 76
Mississippi	7,991,803.92	7,962,877 51	144,097.80	3,410 41	51 22	45,394 48	442,086 37	16,589,721.70	16,472 37
Missouri	141,212,569 54	17,056,751 94	185 00	906 00	97,526 00	32,509 10	31,859,652 07	190,260,099 65	19,077 20
Montana	4,654,748 42	212 29	0.00	0.00	136 48	20.70	7,036,279.65	11,691,397.53	5,686,051 77
Nebraska	60 75	316,565 07	0 00	1 13	68,908 00	34,380 57	1,325,923 58	1,745,839 10	0 00
Nevada	1,846,902 62	679,168.71	993,336 00	43 30	289 00	1,526.88	42,282,878.84	45,804,145.35	56 01
New Hampshire	28,740 84	418,021 64	10,085 94	62 10	0 20	1,874 09	41,810 56	500,595 37	27,659 39
New Jersey	42,787 33	3,066,965 35	0 00	129 07	223,006 33	49,961 51	3,261,311 13	6,644,160.73	4,994 74
New Mexico	0 00	116,250 80	234,392 00	0 00	26,128 00	23 84	7,297,200 20	7,673,994 84	14,300 00
New York	6,750,793.61	5,467,802 21	3,993 30	1,172 33	156,716 45	25,838 22	717,470.17	13,123,786 29	57,139 84
North Carolina	156,094 29	20,606,842 63	1,180 37	1,336 87	225,187 83	6,063 75	1,023,058 45	22,019,764 18	4,736 11
North Dakota	0 00	3,646 00	0 00	0 00	0 00	0 00	193,831 73	197,477 73	0 00
Northern Marianas	0 00	0 00	0 00	0 00	0 00	0 00	5 89	5 89	0 00
Ohio	58,940,499 97	11,485,206 69	594 20	25,581 00	1,550,463 74	15,863 29	7,606,151 82	79,624,360 72	12,090 30
Oklahoma	239,370 60	2,016,730 34	141,695 00	360 50	4,283 00	1,600 36	759,974 03	3,164,013 83	12,641 17
Oregon	5,174 24	4,339,373.48	1,983 00	13,901 69	1,509 82	4,280 32	2,350,246 84	6,716,469 39	994.14
Pennsylvania	43,245,469 40	10,735,076 04	305,862 28	388 30	224,065 79	68,557 75	5,730,556 81	60,309,976 38	77,004 87
Puerto Rico	2.00	110,173 42	35,963 00	0 00	1 00	628 42	58,683 66	205,451 50	1.52
Rhode Island	340,100 20	79,896 41	0 01	26 00	24 00	3,009 10	12,567 15	435,622 86	166 90
South Carolina	554,611 51	5,400,752 23	52,055 96	3,403 50	97,245 78	46,386 35	4,927,599 93	11,082,055 27	30,421 29
South Dakota	20 00	788,005 72	0 00	0 00	0 00	1,171 42	3,000,640 76	3,789,837 91	712 00
Tennessee	10,334,524 84	26,789,270 58	3,420,554 20	1,654 60	595,802 85	24,163 89	7,126,342 92	48,292,313 88	1,523 03
Texas	2,867,608 97	4,335,296 64	2,199,635 63	44,108 50	4,863,301 41	532,381 67	14,652,758 21	29,495,091 02	11,012,278 46
Utah	1,351.69	167,259 32	0.00	0 00	971,445.36	1,049 65	94,876,188 14	96,017,294 16	981,784 44
Vermont	636 00	861,055 00	0 00	3 20	0 00	183 90	23,654 66	885,532 76	0 00
Virgin Islands	0 00	131 00	0 00	0 00	0 00	0 00	3,962 03	4,093 03	0.00
Virginia	41,626 70	962,968 97	0 00	3,481 29	64,830 30	862 10	1,004,488 95	2,078,258 32	2,515 53
Washington	93,420 50	1,072,654.16	102,727 70	523 70	489,580 15	4,044.21	877,276 82	2,640,227 25	18,869 89
West Virginia	115,726 90	140,523 86	13 68	0 00	11,782 80	1,265 00	1,525,579 17	1,794,891 41	3,901 00
Wisconsin	586,066 57	7,296,260 26	39 10	1,990 00	63,618 60	6,992 83	529,201 68	8,484,169 04	400 00
Wyoming	0 00	21 00	20,065 00	0 00	1,300 17	68 73	375,762 66	397,217 56	46 33
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

pounds out of 324.8 million pounds). Another 20.7 percent (67.3 million pounds) was other off-site transfers to disposal.

Transfers to recycling were the major type of transfer for all PBT chemicals primarily because of the 255.5 million pounds of such transfers of lead and lead compounds. Transfers to recycling of lead and lead compounds were 99.6 percent of all transfers

Table 3-6: Quantities of TRI Chemicals in Waste by Industry, PBT Chemicals, 2001

SIC Code	Industry	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On- and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-production-related Waste Managed Pounds
10	Metal Mining	2,680,300 50	738,371 91	0 00	98,029 60	0 00	1,320 60	336,642,813 10	340,160,835 71	444,870 18
12	Coal Mining	0 00	5 00	0 00	0 00	119 00	0 00	1,243,533 95	1,243,657 95	13,978 00
20	Food	0 00	1,442 15	1,128,843 97	0 00	69,749 94	86 00	192,509 44	1,392,631 50	1,511 90
21	Tobacco	0 00	0 00	0 00	0 00	0 00	0 00	7,744 10	7,744 10	0 00
22	Textiles	0 00	3,000 00	34,699 00	871 00	0 00	24,188 42	73,953 18	136,711 60	341 86
23	Apparel	0 00	0 00	0 00	0 00	0 00	0 00	75 00	75 00	0 00
24	Lumber	11,969 78	29,475 51	434,195 20	24,495 34	13,629 94	98,096 01	120,842 50	732,704 29	2,233 07
25	Furniture	0 00	27,298 58	1,153 61	117 28	5 00	77 29	33,050 56	61,702 33	197 00
26	Paper	79 31	10,913 59	46,031 05	98 00	21,929 52	4,120 33	555,595 03	638,766 84	1,529 60
27	Printing	405 00	169,151 46	0 00	1,884 00	0 00	90 13	46,370 53	217,901 11	0 00
28	Chemicals	745,296 32	2,531,321 20	3,576,336 99	73,430 93	5,866,958 81	289,664 47	7,077,945 63	20,160,954 36	25,215 46
29	Petroleum	440,900 70	363,140 34	162,106 80	77,603 44	826,326.92	21,469.85	532,962 39	2,424,510 44	24,645 38
30	Plastics	471,859 15	762,522 30	3,234 00	5,741 80	36,130 00	58,811 47	411,624 11	1,749,922 83	57 60
31	Leather	0 00	0 00	577 00	2 91	0 00	0 00	26 16	606 07	0 00
32	Stone/Clay/Glass	82,217,348 73	1,047,823 94	34,806 40	76 00	1,496 66	91,063 33	2,608,872 28	86,001,487 36	31,599 93
33	Primary Metals	368,925,743 10	28,708,792 91	5,336 00	252 70	2,382,676 07	540,684 25	45,606,088 20	446,169,573 23	17,530,414 70
34	Fabricated Metals	1,684,526 70	10,322,027 57	0 00	2,169 00	1,978 90	72,059 75	583,255 54	12,666,017 45	48,999 07
35	Machinery	284,005 00	2,716,276 31	0 00	2,622 71	2 00	2,619 00	125,456 38	3,130,981 40	5,509 26
36	Electrical Equip	82,296,436 21	190,886,562.26	3,607,429 24	4,563 08	1,393,154 20	52,475 34	5,137,373 74	283,377,994 07	73,269 85
37	Transportation Equip	2,973,324 90	3,548,452 80	0 00	51 20	7,979 81	3,732 60	420,430 31	6,953,971 62	7,054 87
38	Measure/Photo	88,117 00	423,602 75	0 00	28 00	24 08	6,780 70	75,706 25	594,258 77	1,118 39
39	Miscellaneous	11,341 00	83,899 16	0 00	0 00	121 50	3,439 03	23,184 06	121,984 75	20 22
--	Multiple codes 20-39	3,278,323 08	14,611,315 84	105,161 01	1,141 69	64,108 60	34,511 70	1,310,840 41	19,405,402 33	77,136 02
--	No codes 20-39	382,066 00	733,176 44	87,667 22	0 00	4,651 00	44,862 23	2,310,492 43	3,562,915 33	71,074 14
491/493	Electric Utilities	104,723 00	77,051 92	1,639,933 15	652 71	3,264,015 40	19,552 69	8,645,611 90	13,751,540 76	34,524 97
5169	Chemical Wholesale Distributors	0 00	3,925 80	0 00	0 00	0 00	0 22	4,984 05	8,910 07	0 00
5171	Petroleum Terminals/Bulk Storage	516 85	3,291 84	0 01	1,680 65	48 99	2,705 35	19,425 81	27,669 49	1,469 76
7389/4953	Hazardous Waste/Solvent Recovery	15,839 37	1,996,616 58	3,088 64	11,588 19	6,029,449 05	330,009 10	26,298,977 86	34,685,568 78	8,149 05
	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

to recycling of PBT chemicals in 2001. Similarly, other transfers to disposal of lead and lead compounds were 64.6 million pounds or 96.0 percent of total other transfers to disposal for PBT chemicals.

In 2001, facilities in Tennessee reported the largest amount of PBT chemicals transferred off-site for further waste management, including disposal, with 27.9 million pounds (see Table 3-8). This represented 8.6 percent of the total for all PBT chemicals. New Jersey reported another 21.9 million pounds of transfers off-site of PBT chemicals for further waste management, including disposal, for 6.7 percent of the total. North Carolina and Missouri had the next largest amounts, with 20.8 million pounds and 20.7 million pounds, respectively, representing about 6.4 percent each.

Tennessee reported most of their PBT chemicals transferred off-site for further waste management, including disposal, as transfers to recycling, with 27.1 out of 27.9 million pounds. The 27.1 million pounds of transfers to recycling accounted for 10.6 percent of all transfers to recycling of PBT chemicals in 2001. North Carolina had the next largest amount of transfers to recycling, with 20.3 million pounds or 7.9 percent of the total for such transfers, and Iowa had the third largest, with 19.1 million pounds or 7.4 percent.

New Jersey sent most of its transfers as other off-site transfers to disposal, with 18.8 out of 21.9 million pounds. This represented 28.0 percent of all other off-site transfers to disposal of PBT chemicals. Texas had the second largest amount of other off-site transfers to disposal, with 12.8 million pounds or 19.0 percent of the total of such transfers of PBT chemicals in 2001.

In 2001, the electrical equipment industry had the largest transfers off-site for further waste management, including disposal, of PBT chemicals (see Table 3-9). This industry reported 189.7 million pounds of transfers off-site for further waste man-

Table 3-7: TRI Transfers Off-site for Further Waste Management, including Disposal, PBT Chemicals, 2001

CAS Number	Chemical	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs: Metals and Metal Category Compounds Pounds	Transfers to POTWs: Non-metal TRI Chemicals Pounds	Other Off-site Transfers* Pounds	Other Off-site Transfers to Disposal** Pounds	Total Transfers for Further Waste Management, including Disposal Pounds
--	**Dioxin and dioxin-like compounds*** **	**0.26**	**7.16**	**100.92**	**0.00**	**0.17**	**0.00**	**200.91**	**309.42**
--	*Dioxin and dioxin-like compounds (in grams)****	*118 613*	*3,248 079*	*45,767 920*	*0 000*	*76 441*	*0 000*	*91,116 041*	*140,327 093*
	Lead and Lead Compounds	**255,534,760.13**	**7,929.79**	**23,420.48**	**48,948.57**	**0.00**	**14,456.53**	**64,609,428.29**	**320,238,943.78**
7439-92-1	Lead	61,903,264.25	473 99	12,123.68	18,798 10	0.00	9,938.44	6,212,706.53	68,157,304.99
--	Lead compounds	193,631,495 88	7,455 80	11,296 80	30,150 46	0 00	4,518 09	58,396,721 76	252,081,638.79
	Mercury and Mercury Compounds	**160,904.56**	**0.00**	**13.40**	**469.60**	**0.00**	**1,392.00**	**246,408.57**	**409,188.12**
7439-97-6	Mercury	74,756 08	0 00	13.00	103 71	0.00	1,392 00	82,958.66	159,223.45
--	Mercury compounds	86,148 48	0 00	0 40	365 89	0 00	0 00	163,449 91	249,964 67
	Polycyclic aromatic compounds	**917,122.25**	**186,014.86**	**119,571.52**	**0.00**	**6,377.58**	**105.82**	**1,671,426.45**	**2,900,618.49**
191-24-2	Benzo(g,h,i)perylene	37,468 68	3,754.58	1,755 55	0 00	328 62	0.00	86,393 81	129,701.24
--	Polycyclic aromatic compounds	879,653 57	182,260.28	117,815 97	0 00	6,048 97	105 82	1,585,032 64	2,770,917 24
1336-36-3	**Polychlorinated biphenyls (PCBs)**	**927.79**	**19.69**	**316,076.12**	**0 00**	**3.08**	**0.00**	**58,827.72**	**375,854.40**
	Pesticides	**179.00**	**2,648.15**	**127,370.82**	**0.00**	**11.00**	**0.00**	**51,759.94**	**181,968.91**
309-00-2	Aldrin	0.00	306 00	11 00	0 00	0 00	0.00	1 07	318.07
57-74-9	Chlordane	0 00	0 00	425 00	0 00	0 00	0 00	331 61	756 61
76-44-8	Heptachlor	8.00	334.00	116.00	0 00	0 00	0 00	28.24	486 24
465-73-6	Isodrin	2 00	0 00	142 00	0 00	0 00	0 00	443 63	587 63
72-43-5	Methoxychlor	0.00	1,376 00	11,846 00	0 00	0 00	0 00	95 93	13,317.93
40487-42-1	Pendimethalin	0 00	0 00	34,656 00	0 00	0 00	0 00	46,702 21	81,358 21
8001-35-2	Toxaphene	169 00	7.15	200 82	0 00	1 00	0 00	1,090 14	1,468.11
1582-09-8	Trifluralin	0 00	625 00	79,974 00	0 00	10 00	0 00	3,067 11	83,676 11
	Other PBTs	**2,214.02**	**6,603.00**	**82,057 37**	**0.00**	**29.90**	**0.10**	**644,269.81**	**735,174.19**
118-74-1	Hexachlorobenzene	1,432 02	2,132.80	33,376.71	0.00	20.90	0 10	18,073 14	55,035.66
29082-74-4	Octachlorostyrene	0 00	0 00	0 00	0 00	0 00	0 00	508 60	508 60
608-93-5	Pentachlorobenzene	770.00	1,491 00	4,381 36	0 00	0 00	0 00	206.32	6,848 68
79-94-7	Tetrabromobisphenol A	12 00	2,979 20	44,299 30	0 00	9 00	0 00	625,481 75	672,781 25
	Total	**256,616,108.02**	**203,222.65**	**668,610.63**	**49,418.17**	**6,421.73**	**15,954 45**	**67,282,321.67**	**324,842,057.31**

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
*** 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

agement, including disposal, which accounted for 58.4 percent of the total transfers off-site for further waste management, including disposal. The primary metals industry had the second largest amounts, with 61.2 million pounds or 18.9 percent of the total. The chemical manufacturing industry was third with 23.3 million pounds or 7.2 percent of the total.

The electrical equipment industry reported most of its transfers off-site for further waste management, including disposal, as transfers to recycling. The 188.1 million pounds of transfers to recycling by the electrical equipment industry represented 99.1 percent of the industry's total transfers off-site for further waste management, including disposal, and represented 73.3 percent of total transfers to recycling of PBT chemicals in 2001.

The primary metals industry reported 33.1 million pounds of other off-site transfers to disposal (54.0 percent of the industry total) and 28.1 million pounds of transfers to recycling (46.0 percent of the industry total). The 33.1 million pounds of other off-site transfers to disposal reported by the primary metals industry was the largest such transfers reported by any industry sector and accounted for 49.1 percent of the total for all PBT chemicals in 2001.

Table 3-8: TRI Transfers Off-site for Further Waste Management, including Disposal, by State, PBT Chemicals, 2001

State	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs: Metals and Metal Category Compounds Pounds	Transfers to POTWs: Non-metal TRI Chemicals Pounds	Other Off-site Transfers* Pounds	Other Off-site Transfers to Disposal** Pounds	Total Transfers for Further Waste Management, including Disposal Pounds
Alabama	4,266,759.33	2,109.09	85,747.13	510.39	4.70	0.00	709,007.41	5,064,138.05
Alaska	0.00	0.30	0.80	1,106.80	0.00	0.00	1,245.20	2,353.10
American Samoa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arizona	932,795.77	345.00	27,617.50	253.26	0.00	0 00	78,711.96	1,039,723.50
Arkansas	4,951,767.58	12,169.10	16,836.60	210.61	54.90	0.00	2,549,787.48	7,530,826.27
California	16,706,184.51	2,756.62	55,423 32	4,157.65	30.21	247.37	841,945.79	17,610,745.46
Colorado	3,592,669.06	8.70	1,572.20	58.42	8.60	0.00	127,996.64	3,722,313.62
Connecticut	835,369.25	10.10	567.81	153.48	0.00	0.00	741,428.93	1,577,529.57
Delaware	4,570,750.92	0.00	0.03	521.37	0.00	0.00	61,681.39	4,632,953.71
District of Columbia	4,511.00	0.00	0.00	0.00	0.00	0.00	958.60	5,469.60
Florida	7,057,008.10	146.59	4,089.58	1,003.64	8.30	250.00	331,978.16	7,394,484.37
Georgia	9,570,120.35	2.76	8,024.10	1,302.44	21.20	0.00	124,117.42	9,703,588.28
Guam	0.00	0.00	3.00	0.00	0.00	0.00	0.00	3.00
Hawaii	16,845.48	0.00	15.01	0.00	0.00	0.00	48,356.22	65,216.71
Idaho	453,054.47	0.00	31,303.00	97.84	0.00	0.00	86,512.44	570,967.75
Illinois	10,536,946.24	58,779.74	3,061.51	2,917.44	66.80	1,020.00	1,505,907.34	12,108,699.07
Indiana	11,227,468.43	786.80	14,095.22	3,621.32	28.22	33.67	3,714,273.19	14,960,306.86
Iowa	19,096,546.49	741 20	76,680.80	1,152.38	0.00	0.00	788,651.96	19,963,772.83
Kansas	8,120,318.92	22.00	26,791.37	163.89	0.03	0.00	94,407.00	8,241,703.21
Kentucky	8,000,414.60	1.00	4,380 54	470.76	6.20	0.00	209,605.85	8,214,878.95
Louisiana	9,338,748.05	20,248.60	51,547.63	702.02	26.40	0.00	340,612.77	9,751,885.47
Maine	41,015.30	1,036.60	20.40	18.94	0.00	0 00	297,928.50	340,019.75
Maryland	287,621.62	0.00	207.97	509.35	1,256.20	800.00	90,676.64	381,071.78
Massachusetts	676,630.14	1,647.12	90,031.74	879.91	0 01	1,500.00	305,693.44	1,076,382.37
Michigan	2,252,402.37	188.24	49.11	3,055.70	96.05	0.00	1,181,372.87	3,437,164.35
Minnesota	2,909,441.60	1,021.70	398.53	1,094.04	10.37	0.00	481,545.22	3,393,511.46
Mississippi	7,961,609.51	3,410.41	3,846.50	646.11	8.20	0.00	67,172.10	8,036,692.83
Missouri	17,085,020.67	902.00	29,528.93	1,527.87	6.38	1,500.00	3,571,072.00	20,689,557.85
Montana	1,076.29	0.00	0.00	4.40	0.00	0.00	792,880.89	793,961.58
Nebraska	313,808.46	1.13	0.37	369 99	0.00	0.00	1,235,241.66	1,549,421.62
Nevada	678,999.81	6.90	139.84	55.75	0.00	2,780.00	14,120.69	696,102.99
New Hampshire	420,649.60	151.80	320.36	125.43	0.00	231.69	50,067.95	471,546.82
New Jersey	3,074,513.01	77.77	2,317.94	390.98	2.80	2,623.10	18,809,116.06	21,889,041.66
New Mexico	116,678.60	0.00	22.00	14.80	0.00	0.00	140,354.75	257,070.15
New York	5,466,370.33	1,419.09	20,164.16	5,777.92	34.48	17.32	449,859.29	5,943,642.59
North Carolina	20,296,189.33	184.01	884.71	353.16	0.00	250.00	499,084.31	20,796,945.51
North Dakota	3,646.00	0.00	30.00	0.00	0.00	0.00	77,164.17	80,840.17
Northern Marianas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ohio	11,494,112.98	24,407.80	10,275.73	3,119.26	69.10	804.00	3,908,210.48	15,440,999.35
Oklahoma	2,016,504.12	357.22	113.30	295 79	1,486.00	0.00	210,559.26	2,229,315.69
Oregon	4,346,075.98	13,904.26	3,757.01	336 84	20.01	0.00	729,733.66	5,093,827.76
Pennsylvania	10,300,737 76	7,580.30	3,691 36	1,824 46	13.50	1,755.30	4,445,176.37	14,760,779.06
Puerto Rico	108,805.42	0.00	511.52	31.90	11.60	1,392.00	13,394.46	124,146.89
Rhode Island	72,051.51	26.00	0 10	56.74	0.00	0 00	12,405.90	84,540.25
South Carolina	5,226,805.83	3.50	3,312 09	1,106.09	2.24	0.00	1,008,236.27	6,239,466.02
South Dakota	788,039.72	0.00	1,170.42	81.50	0.00	0.00	1,783.53	791,075.17
Tennessee	27,120,332.74	767.50	23,459.23	2,386.27	0.27	0.00	795,515.79	27,942,461.80
Texas	3,923,415.48	47,674.50	55,307.34	2,759.62	3,139.86	750.00	12,767,912.61	16,800,959.41
Utah	149,098.93	0.00	899.65	34.79	0.00	0.00	651,053.25	801,086.63
Vermont	861,055 00	3 20	0.00	55.45	0 00	0.00	22,674.14	883,787.79
Virgin Islands	161.00	0.00	0.00	0.00	0.00	0.00	541.00	702.00
Virginia	962,571.49	214.29	561 86	1,562 51	7.50	0.00	572,814.87	1,537,732.52
Washington	1,080,580.10	3.70	5,283.04	125.68	0.00	0.00	608,762.30	1,694,754.83
West Virginia	141,888.86	0.00	456 00	24.39	0.00	0.00	498,789 98	641,159 22
Wisconsin	7,159,898.88	106.00	161.20	2,388.84	1.60	0.00	393,955.34	7,556,511.86
Wyoming	21.00	0 00	3,931.05	0.00	0.00	0 00	220,266.17	224,218.22
Total	**256,616,108.02**	**203,222.65**	**668,610.63**	**49,418.17**	**6,421.73**	**15,954.45**	**67,282,321.67**	**324,842,057.31**

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

Table 3-9: TRI Transfers Off-site for Further Waste Management, including Disposal, by Industry, PBT Chemicals, 2001

SIC Code	Industry	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs: Metals and Metal Category Compounds Pounds	Transfers to POTWs: Non-metal TRI Chemicals Pounds	Other Off-site Transfers* Pounds	Other Off-site Transfers to Disposal** Pounds	Total Transfers for Further Waste Management, including Disposal Pounds
10	Metal Mining	737,344 30	29 60	118 70	1,162.10	0.00	0.00	10,876 55	749,531.26
12	Coal Mining	5 00	0 00	0 00	0 00	0.00	0 00	10,830 00	10,835 00
20	Food	1,692.15	525 40	0.00	80 80	10.01	0 00	30,085 73	32,394.09
21	Tobacco	0 00	0 00	0 00	0 00	0.00	0 00	7,461 50	7,461 50
22	Textiles	2,090 30	0 00	16,490.40	362 00	0.00	0.00	33,770 31	52,713 01
23	Apparel	0 00	0 00	0 00	0 00	0.00	0 00	0 00	0 00
24	Lumber	35,353 10	31,277.64	44,054.17	465 04	152.76	0 00	32,975.25	144,277 96
25	Furniture	27,641 74	0 00	0 00	5 39	0 00	0 00	27,509 57	55,156 71
26	Paper	28,277 37	98 00	10 11	5,058 16	1,300.01	32.77	125,550 80	160,327 22
27	Printing	171,218 46	0 00	0 00	86 68	0 00	1,020 00	32,593 54	204,918 68
28	Chemicals	2,400,350 31	76,044 33	250,864 32	2,989 73	86.91	0.40	20,585,486.85	23,315,822 85
29	Petroleum	369,054 79	77,720 14	9,114 23	2,347 39	3,240 46	0 00	325,695 05	787,172 07
30	Plastics	855,985 49	2,195.32	1,405.64	782.39	1,495.27	0 00	385,343.51	1,247,207 61
31	Leather	0 00	2 91	0 00	0 00	0.00	0 00	0 00	2 91
32	Stone/Clay/Glass	1,101,445 06	79 00	6,495 19	1,680 17	0.00	0.00	1,636,513 08	2,746,212.50
33	Primary Metals	28,144,878 03	216 30	26,694 50	4,687 30	92.00	231 69	33,059,254 54	61,236,054 37
34	Fabricated Metals	9,996,385 28	12 00	5,049.00	4,433 62	0.00	3,255 00	560,950 43	10,570,085 34
35	Machinery	2,700,429 27	21 78	2,042 00	777 22	0.00	1,500 00	87,990 71	2,792,760 98
36	Electrical Equip.	188,131,068.38	2,468 78	11,087 89	9,597 52	8.00	7,300.00	1,588,214 74	189,749,745.30
37	Transportation Equip	3,540,187 16	1 10	403 40	6,448 93	0 00	0 00	590,669 48	4,137,710 07
38	Measure/Photo.	433,067 55	31 57	263 18	974 53	0.00	804.00	47,030.38	482,171 21
39	Miscellaneous	151,816 62	0 00	1,960 00	70 24	0 00	800 00	30,528 00	185,174 86
--	Multiple codes 20-39	14,582,925 55	100 70	2,343 81	4,040 86	0.04	226 92	814,924 36	15,404,562.25
--	No codes 20-39	715,871 15	0 00	1,366 88	1,166 11	27 00	783 67	376,237 88	1,095,452 69
491/493	Electric Utilities	139,954 19	653 51	119 92	348 84	3.80	0.00	1,747,222.41	1,888,302 67
5169	Chemical Wholesale Distributors	3,925 80	0 00	0 22	0 00	0.00	0 00	5,012 62	8,938 64
5171	Petroleum Terminals/Bulk Storage	3,519.96	742 73	1,994 75	8 00	1.47	0 00	8,286 93	14,553 84
7389/4953	Hazardous Waste/Solvent Recovery	2,341,621 00	11,001 83	286,732 30	1,845 15	4.00	0 00	5,121,307 43	7,762,511 71
	Total	**256,616,108.02**	**203,222.65**	**668,610.63**	**49,418.17**	**6,421.73**	**15,954.45**	**67,282,321.67**	**324,842,057.31**

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

The chemical manufacturing industry reported the second largest other off-site transfers to disposal, with 20.6 million pounds, representing 30.6 percent of total such transfers of PBT chemicals and 88.3 percent of the industry's total transfers off-site for further waste management, including disposal.

Projected Quantities of TRI Chemicals Managed in Waste, 2001-2003

As described in **Waste Management** in Chapter 1, on each Form R that it submits, a facility reports actual quantities of chemicals managed as waste for the current and prior years and projected quantities for the next two years. Overall, projected reductions of all PBT chemicals from 2001 to 2003 were 14.5 percent, with a reduction of 11.7 percent expected from 2001 to 2002 and of 3.1 percent from 2002 to 2003 (as shown in Table 3-10).

Most of the groups of PBT chemicals also projected reductions in the quantities of toxic chemicals in production-related waste to 2002 from their totals in 2001. Reductions of lead and lead compounds in production-related waste were projected to be 11.9 percent from 2001 to 2002. Dioxin and dioxin-like compounds had a projected 9.2 percent reduction and polychlorinated biphenyls a 4.0 percent reduction for the same time period. These three groups of PBT chemicals also projected decreases for the period 2002 to 2003.

For the other groups of PBT chemicals, facilities projected a reduction in total quantities in production-related waste from 2001 to 2002 but projected an increase from 2002 to 2003. Polycyclic aromatic compounds had a projected reduction of 9.7 from 2001 to 2002 but a projected increase of 4.8 percent from 2002 to 2003. Mercury and mercury com-

Table 3-10: Prior Year, Current Year and Projected Quantities of TRI PBT Chemicals in Waste, 2000-2003

CAS Number	Chemical	Total Production-related Waste Managed: Prior Year 2000 Pounds	Current Year 2001 Pounds	Projected 2002 Pounds	Projected 2003 Pounds	Change 2000-2001 Percent	Projected Change 2001-2002 Percent	Projected Change 2002-2003 Percent	Projected Change 2001-2003 Percent
	-- Dioxin and dioxin-like compounds*	**797.23**	**984 86**	**894.74**	**690.30**	**23.5**	**-9.2**	**-22.8**	**-29.9**
	*-- Dioxin and dioxin-like compounds (in grams)**	*361,556 062*	*446,648 574*	*405,777 173*	*313,062 009*	*23 5*	*-9 2*	*-22 8*	*-29 9*
	Lead and Lead Compounds	**NA**	**1,233,580,792.90**	**1,086,610,934.28**	**1,050,335,532.66**	**NA**	**-11.9**	**-3.3**	**-14.9**
7439-92-1	Lead	NA	267,786,685 31	310,386,578 51	270,668,351 64	NA	15 9	-12 8	1 1
	-- Lead compounds	NA	965,794,107 59	776,224,355 77	779,667,181 02	NA	-19 6	0 4	-19 3
	Mercury and Mercury Compounds	**4,676,152.17**	**5,818,537.36**	**5,505,929.94**	**5,506,247.90**	**24.4**	**-5 4**	**0.01**	**-5.4**
7439-97-6	Mercury	444,776 20	518,833 63	436,680 89	432,392 78	16 7	-15 8	-1 0	-16 7
	-- Mercury compounds	4,231,375 97	5,299,703 74	5,069,249 06	5,073,855 12	25 2	-4 3	0 1	-4 3
	Polycyclic Aromatic Compounds	**32,278,777 10**	**25,002,460.79**	**22,582,984.30**	**23,666,013.07**	**-22.5**	**-9.7**	**4.8**	**-5.3**
191-24-2	Benzo(g,h,i)perylene	2,386,402 11	1,313,855 78	1,404,440 86	1,437,140 44	-44 9	6 9	2 3	9 4
	-- Polycyclic aromatic compounds	29,892,374 99	23,688,605 01	21,178,543 44	22,228,872 63	-20 8	-10 6	5 0	-6 2
1336-36-3	**Polychlorinated biphenyls (PCBs)**	**11,233,495.33**	**4,127,841 31**	**3,963,565 69**	**3,672,772.06**	**-63.3**	**-4.0**	**-7 3**	**-11.0**
	Pesticides	**2,542,804.01**	**2,659,833.14**	**2,432,319.74**	**2,451,706.27**	**4 6**	**-8.6**	**0.8**	**-7.8**
309-00-2	Aldrin	75,986 17	58,877 38	58,629 41	58,723 41	-22 5	-0 4	0 2	-0.3
57-74-9	Chlordane	852,290 26	468,564 59	384,610 08	385,981 68	-45 0	-17 9	0 4	-17 6
76-44-8	Heptachlor	240,370 48	752,719 47	712,628.80	712,802.81	213 1	-5.3	0.02	-5 3
465-73-6	Isodrin	6,544 89	4,407 19	4,303 20	4,310 21	-32 7	-2 4	0 2	-2 2
72-43-5	Methoxychlor	292,121 57	333,815 39	328,533 16	328,874 29	14 3	-1 6	0 1	-1 5
40487-42-1	Pendimethalin	713,099 02	503,199 29	466,082 29	484,018 29	-29 4	-7 4	3 8	-3 8
8001-35-2	Toxaphene	216,955 38	130,175 13	119,134 49	119,722 87	-40 0	-8.5	0 5	-8 0
1582-09-8	Trifluralin	145,436 24	408,074 70	358,398 31	357,272 71	180 6	-12 2	-0 3	-12 4
	Other PBTs	**4,660,466.15**	**8,196,549.19**	**8,054,495.68**	**8,057,718.59**	**75.9**	**-1.7**	**0.04**	**-1.7**
118-74-1	Hexachlorobenzene	3,739,472 73	6,738,560 45	6,615,919 28	6,616,306 69	80.2	-1 8	0.01	-1 8
29082-74-4	Octachlorostyrene	604 20	709 72	716 00	754 00	17 5	0 9	5 3	6 2
608-93-5	Pentachlorobenzene	120,838 51	452,512 70	452,475 20	453,443 70	274 5	-0 01	0 2	0 2
79-94-7	Tetrabromobisphenol A	799,550 71	1,004,766 31	985,385 20	987,214 20	25 7	-1 9	0 2	-1 7
	Total	**NA**	**1,279,386,999.55**	**1,129,151,124.37**	**1,093,690,680.84**	**NA**	**-11.7**	**-3.1**	**-14.5**

Note: Data from Section 8 of Form R for 2001
NA not available Reporting thresholds for lead and lead compounds were lowered for 2001, therefore, facilities reporting for the first time for 2001 may not have reported an amount for 2000
* 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

pounds had a projected reduction of 5.4 percent from 2001 to 2002 and a slight projected increase from 2002 to 2003, mainly in mercury compounds. Similarly, the group of four other PBTs had a projected decrease of 1.7 percent from 2001 to 2002 and a slight projected increase from 2002 to 2003. For the group of pesticides, each of the eight pesticides had a projected reduction from 2001 to 2002 for an overall reduction of 8.6 percent for the group. For the period 2002 to 2003, however, all but trifluralin had a projected increase.

The projected decreases from 2001 to 2002 came after actual increases in most of the groups of PBT chemicals. Quantities of dioxin and dioxin-like compounds in production-related waste increased by 23.5 percent from 2000 to 2001, mercury and mercury compounds increased by 24.4 percent and the group of four other PBT chemicals increased by 75.9 percent. While the group of eight pesticides increased overall by 4.6 percent from 2000 to 2001, most of the individual pesticides reported a decrease. Heptachlor was the pesticide showing the largest increase from 2000 to 2001, with an increase of over 200 percent, from 240,370 pounds to 752,719 pounds.

Both polycyclic aromatic compounds and polychlorinated biphenyls had reported decreases from 2000 to 2001, with reductions of 22.5 percent and 63.3 percent, respectively. The change from 2000 to 2001 for lead and lead compounds is not available because the reporting thresholds for these chemicals were lowered for 2001 and, therefore, 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.

TRI FEDERAL FACILITIES' DATA FOR PBT CHEMICALS, 2001

As is shown in Table 3-11, federal facilities reported on PBT chemicals on 312 forms for 2001. Federally owned facilities that are operated by federal agencies or contractors are required to report to TRI, regardless of SIC code, pursuant to Executive Order 13148.

On- and Off-site Releases, 2001

Federal facilities reported releases on- and off-site of PBT chemicals totaling 3.3 million pounds in 2001 (see Table 3-11). The bulk of the releases, 2.9 million pounds, occurred on-site. Most of the on-site releases were as other on-site land releases (that is, other than to RCRA subtitle C landfills). Such releases totaled 2.8 million pounds or 84.0 percent of total releases of PBT chemicals reported by federal facilities. Off-site releases (transfers to disposal) of PBT chemicals reported by federal facilities totaled 440,908 pounds.

Department of Defense agencies reported 2.1 million pounds of on- and off-site releases, with the Army reporting 1.3 million pounds of this. The Army's total represented 40.0 percent of total releases of PBT chemicals for all federal facilities in 2001. It included mostly on-site land releases to sites other than RCRA subtitle C landfills (1.26 million pounds or 94.9 percent of the Army's total of 1.33 million pounds). The Army also reported the largest air emissions, with 51,656 pounds or 64.7 percent of total air emissions of PBT chemicals reported by federal facilities.

Tennessee Valley Authority (TVA) facilities reported the second largest total releases of PBT chemicals reported by federal facilities, with 786,576 pounds or 23.7 percent of the total for 2001. Over 94.5 percent of the TVA's total releases of PBT chemicals were as other on-site land releases (that is, other than to RCRA subtitle C landfills).

The Marines reported the third largest total releases of PBT chemicals, with 436,013 pounds. Most of this (429,682 pounds or 98.5 percent) was other on-site land releases (that is, other than to RCRA subtitle C landfills).

Table 3-11: TRI On-site and Off-site Releases of PBT Chemicals by Agency, 2001: Federal Facilities

		On-site Releases							Off-site Releases	Total
				Underground Injection		On-site Land Releases				
Federal Agency	Total Forms	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	On- and Off-site Releases
	Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Department of Defense	172	62,819.34	1,017 19	0 00	0 00	0 00	1,859,556.69	1,923,393 21	145,500.91	2,068,894.12
Air Force	32	3,101 41	120 14	0 00	0 00	0 00	109,319 90	112,541 45	5,042 30	117,583 75
Army	84	51,656.49	256.68	0.00	0.00	0 00	1,259,994 79	1,311,907 95	15,823 06	1,327,731.01
Marines	20	6,043 60	0 00	0.00	0 00	0 00	429,681 80	435,725 40	287 94	436,013 34
Military Academy	2	84 00	0.00	0.00	0.00	0 00	7,760 00	7,844 00	0.00	7,844.00
Navy	34	1,933 84	640 37	0.00	0 00	0 00	52,800 20	55,374 41	124,347 61	179,722 02
Department of Energy	27	3,663 06	1,521 59	0 00	0.00	3,880 00	57,142 73	66,207 37	247,612.32	313,819 70
Department of Interior	10	1 00	310 00	0.00	0 00	0 00	23,258 30	23,569 30	0 00	23,569 30
Department of Transportation	11	227 26	1.70	0.00	0 00	0 00	6,222 00	6,450.96	2,526.72	8,977.68
Department of Treasury	13	64 04	0 00	0.00	0 00	0 00	91,608 00	91,672 04	15,893 62	107,565 66
Department of Veterans Affairs	1	3,436 00	0 00	0.00	0 00	0.00	0 00	3,436 00	0 00	3,436 00
Environmental Protection Agency	8	0 00	296 00	0 00	0 00	0 00	2,971 00	3,267 00	0 00	3,267 00
Environmental Protection Agency	6	0 00	0 00	0.00	0 00	0 00	0 00	0.00	0.00	0.00
US EPA Fund-Lead Superfund Sites	2	0 00	296 00	0.00	0 00	0 00	2,971 00	3,267 00	0 00	3,267 00
National Aeronautics and Space Administration	5	3 76	0 00	0.00	0.00	3 60	4,632 00	4,639 36	3.88	4,643.25
Tennessee Valley Authority	62	9,621 44	4,241 00	0.00	0 00	0 00	743,345 02	757,207 46	29,368 30	786,575 75
US Department of Agriculture	1	1 00	0 00	0.00	0 00	0 00	1,237 00	1,238 00	0.00	1,238.00
US Enrichment Corporation	1	23 00	0 00	0 00	0 00	0 00	570 00	593 00	0 00	593 00
US Government Services Administration	1	0 00	0 00	0 00	0 00	0 00	0 00	0 00	2 70	2 70
Total	**312**	**79,859.90**	**7,387 48**	**0.00**	**0.00**	**3,883.60**	**2,790,542.74**	**2,881,673.71**	**440,908.45**	**3,322,582.16**

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

Department of Energy facilities reported the largest off-site releases (transfers to disposal), with 247,612 pounds. This accounted for 56.2 percent of off-site releases of PBT chemicals reported by federal facilities in 2001.

Waste Management Data, 2001

Quantities of TRI Chemicals in Waste

Federal facilities reported managing almost 5.0 million pounds of PBT chemicals in waste in 2001 (see Table 3-12). The largest waste management types reported by federal facilities were quantities released on- and off-site (3.2 million pounds) and recycled off-site (1.3 million pounds). The quantities released on- and off-site accounted for 64.8 percent of total production-related waste of PBT chemicals for federal facilities and off-site recycling for 26.1 percent of the total.

Department of Defense agencies reported the largest amounts of PBT chemicals in production-related waste, with 2.7 million pounds or 55.0 percent of the total for federal facilities in 2001. The Army accounted for 1.7 million pounds of this or 34.4 percent of the total for federal facilities. Over three-quarters (78.6 percent) of the Army's total PBT chemicals in production-related waste was released on- and off-site. The 1.3 million pounds released on- and off-site by Army facilities accounted for 41.7 percent of all releases on- and off-site of PBT chemicals reported by federal facilities in 2001.

Department of Energy facilities reported the second largest amount of PBT chemicals in production-related waste for 2001, with 1.2 million pounds. Department of Energy facilities reported the largest amount of PBT chemicals recycled off-site of all federal facilities, with 693,938 pounds, accounting for 53.7 percent of the total recycled off-site for all federal facilities.

Tennessee Valley Authority (TVA) facilities reported the third largest amount of PBT chemicals in production-related waste for 2001. The TVA facilities reported a total of 783,427 pounds, with 783,058 pounds (over 99.9 percent) released on- and off-site.

Transfers Off-site for Further Waste Management, including Disposal

Federal facilities reported 1.7 million pounds of PBT chemicals transferred off-site for further waste management, including disposal, of PBT chemicals in 2001 (see Table 3-13). Over 70 percent of these

Table 3-12: Quantities of TRI PBT Chemicals in Waste by Agency, 2001: Federal Facilities

Federal Agency	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
Department of Defense	124,350 00	480,375 40	86,586 00	0 00	9,324 00	39,525.44	1,986,320.95	2,726,481 79	96,990 94
Air Force	0 00	57,443 00	0 00	0 00	4 00	0 00	117,911 13	175,358 13	0 00
Army	1,140.00	347,973 90	0 00	0 00	9,320 00	6,053 60	1,338,793 08	1,703,280 58	77,699 00
Marines	0 00	1,760 00	86,586 00	0 00	0 00	0 00	392,183 40	480,529 40	1,614 10
Military Academy	0.00	0 00	0.00	0 00	0 00	0 00	7,844 00	7,844 00	0 00
Navy	123,210 00	73,198 50	0 00	0 00	0 00	33,471 84	129,589 34	359,469 68	17,677 84
Department of Energy	165,941 51	693,938.18	0.00	0.00	26,521 00	41.00	326,043 27	1,212,484 96	31,928 29
Department of Interior	0 00	0 00	0 00	0 00	0 00	0 00	3,607 30	3,607 30	0 00
Department of Transportation	0.00	16,630 00	0 00	0.00	0 00	21 00	10,628 58	27,279.58	1,539 00
Department of Treasury	30 00	96,698 00	0 00	0 00	3 00	0 00	92,002 27	188,733 27	19 39
Department of Veterans Affairs	0 00	0 00	0.00	0 00	0 00	0 00	3,436 00	3,436.00	0 00
Environmental Protection Agency	0 00	0 00	0 00	0 00	0 00	317 63	0 00	317 63	4,337 00
Environmental Protection Agency	0 00	0.00	0.00	0 00	0 00	317 63	0 00	317 63	0 00
US EPA Fund-Lead Superfund Sites	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	4,337 00
National Aeronautics and Space Administration	0.00	351 00	0.00	0.00	0 00	0 00	4,706 84	5,057 84	1 00
Tennessee Valley Authority	0 00	369 10	0 00	0 00	0 00	0 00	783,057 65	783,426 75	0 00
US Department of Agriculture	0 00	31.00	0 00	0 00	0 00	0 00	1,237 00	1,268.00	0 00
US Enrichment Corporation	0 00	0 00	0 00	0 00	0 00	0 00	570 00	570 00	0 00
US Government Services Administration	0 00	4,500 00	0 00	0 00	0 00	0 00	3 00	4,503 00	0 00
Total	**290,321.51**	**1,292,892.68**	**86,586.00**	**0.00**	**35,848.00**	**39,905 07**	**3,211,612 86**	**4,957,166.12**	**134,815.62**

Note: Data are from Section 8 of Form R

Table 3-13: TRI Transfers Off-site for Further Waste Management, including Disposal, of PBT Chemicals by Agency, 2001: Federal Facilities

Federal Agency	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs: Metals and Metal Category Compounds Pounds	Transfers to POTWs: Non-metal TRI Chemicals Pounds	Other Off-site Transfers* Pounds	Other Off-site Transfers to Disposal** Pounds	Total Transfers for Further Waste Management, including Disposal Pounds
Department of Defense	478,878 40	0.00	28.00	168.29	0.00	0.00	189,992.15	669,066.84
Air Force	57,628.00	0 00	0.00	13 20	0 00	0 00	5,448 10	63,089 30
Army	346,285.90	0.00	28.00	21.00	0.00	0.00	16,317.30	362,652 20
Marines	1,760 00	0 00	0 00	0 00	0 00	0 00	43,385 00	45,145 00
Military Academy	0 00	0.00	0.00	0.00	0 00	0.00	0.00	0.00
Navy	73,204 50	0 00	0 00	134 09	0 00	0 00	124,841 75	198,180 34
Department of Energy	562,078 99	0.00	41.09	13.22	0 00	0.00	253,023.48	815,156.78
Department of Interior	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
Department of Transportation	16,630.62	0.00	0.00	0.00	0.00	0.00	3,681 72	20,312.34
Department of Treasury	96,709.00	0 00	0 00	0 23	0 00	0 00	15,893 39	112,602 62
Department of Veterans Affairs	0.00	0 00	0.00	0 00	0.00	0.00	0.00	0 00
Environmental Protection Agency	62 75	0 00	1,323 88	0 00	0 00	0 00	0 00	1,386 63
Environmental Protection Agency	62 75	0.00	254.88	0 00	0.00	0.00	0.00	317 63
US EPA Fund-Lead Superfund Sites	0 00	0 00	1,069 00	0 00	0 00	0 00	0 00	1,069 00
National Aeronautics and Space Administration	351 00	0.00	0.00	0 00	0 00	0.00	36.88	387.88
Tennessee Valley Authority	557 20	1 90	0 00	0 00	0 00	0 00	29,658 30	30,217 40
US Department of Agriculture	31 00	0 00	0 00	0.00	0 00	0 00	0.00	31.00
US Enrichment Corporation	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
US Government Services Administration	4,500.00	0.00	0.00	0 00	0 00	0.00	2.70	4,502.70
Total	**1,159,798.96**	**1.90**	**1,392.97**	**181.74**	**0.00**	**0.00**	**492,288.60**	**1,653,664.18**

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

transfers were to recycling (1.2 million pounds) and 29.8 percent were other off-site transfers to disposal.

Department of Energy (DOE) facilities reported the largest amount of transfers off-site for further waste management, including disposal, of PBT chemicals among federal agencies. DOE facilities reported 815,157 pounds of total transfers, representing 49.3 percent of all such transfers.

Department of Defense (DOD) agencies reported the second largest amount, with 669,067 pounds of PBT chemicals transferred off-site for further waste management, including disposal in 2001, accounting for 40.5 percent of all such transfers reported by federal facilities. Over half of the DOD amount was reported by the Army, which accounted for 362,652 pounds or 21.9 percent of all such transfers reported by federal facilities. The Navy reported 198,180 pounds or 12.0 percent of the total.

DOE facilities reported the largest amount of transfers to recycling of all federal agencies, with 562,079 pounds or 48.5 percent of all transfers to recycling of PBT chemicals reported by federal facilities in 2001. The Army reported 346,286 pounds of transfers to recycling, accounting for 29.9 percent of all such transfers to recycling.

DOE facilities also reported the largest other off-site transfers to disposal, with 253,023 pounds or 51.4 percent of all such transfers reported by federal facilities. The Navy reported the second largest amount of other off-site transfers to disposal, with 124,842 pounds or 25.4 percent of the total of such transfers.

TRI DATA FOR PBT CHEMICALS, 2000-2001

Comparisons of TRI data for PBT chemicals from 2000 to 2001 do not include data on lead and lead compounds because lower reporting thresholds for these chemicals only became effective for 2001. Therefore, some facilities reporting on lead and lead compounds for 2001 may not have had to report for 2000.

On- and Off-site Releases, 2000-2001

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 1.7 percent (see Table 3-14). Off-site releases (transfers to disposal) of PBT chemicals decreased by 43.9 percent or 2.0 million pounds. This was largely due to a decrease of transfers off-site to landfills/surface impoundments of 1.6 million pounds or 41.0 percent. Transfers off-site for solidification/stabilization of metals and metal category compounds also decreased, by 347,076 pounds or 83.6 percent.

On the other hand, total on-site releases of PBT chemicals increased, by 1.8 million pounds or 25.3 percent, from 2000 to 2001. This was due to an increase in other on-site land releases (that is, other than to RCRA subtitle C landfills) of 1.4 million pounds or 39.1 percent. Releases to RCRA subtitle C landfills also increased, by 747,711 pounds or 43.7 percent. Other types of on-site releases showed decreases, including air emissions which decreased by 355,196 pounds or 20.3 percent.

Table 3-14: TRI On-site and Off-site Releases, PBT Chemicals, 2000-2001

	2000	2001	Change 2000-2001	
	Number	Number	Number	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** Metals and Metal Category Compounds Only	415,330 48	68,254.65	-347,075.83	-83.6
Wastewater Treatment (Excluding POTWs)*** Metals and Metal Category Compounds Only	6,850 32	2,679.38	-4,170 94	-60.9
Transfers to POTWs**** Metals and Metal Category Compounds Only	413.09	469 60	56.51	13 7
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)

Table 3-15: Quantities of TRI Chemicals in Waste by Waste Management Activity, PBT Chemicals, 2000-2001

Waste Management Activity	2000 Pounds	2001 Pounds	Change 2000-2001 Pounds	Change 2000-2001 Percent
Recycled On-site	3,357,805.13	2,936,200.82	-421,604 31	-12.6
Recycled Off-site	808,849.21	1,024,376 20	215,527 00	26 6
Energy Recovery On-site	10,461,080.13	10,774,533.68	313,453.55	3.0
Energy Recovery Off-site	282,609 72	188,074 57	-94,535 15	-33 5
Treated On-site	31,571,703.51	18,724,875.84	-12,846,827.67	-40.7
Treated Off-site	845,698 24	699,880 20	-145,818 04	-17 2
Quantity Released On- and Off-site	11,533,883.15	11,458,265.33	-75,617.81	-0.7
Total Production-related Waste Managed	**58,861,629.10**	**45,806,206.65**	**-13,055,422.45**	**-22.2**
Non-production-related Waste Managed	128,173.87	71,184.28	-56,989.59	-44.5

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

Waste Management Data, 2000-2001

Quantities of TRI Chemicals in Waste, 2000-2001

Total production-related waste of PBT chemicals managed decreased from 58.9 million pounds in 2000 to 45.8 million pounds in 2001, a decrease of 22.2 percent (see Table 3-15). The amount treated on-site decreased by 12.8 million pounds or 40.7 percent. The amount recycled on-site decreased by 421,604 pounds (12.6 percent), and the amount treated off-site decreased by 145,818 pounds (17.2 percent). The amount used for energy recovery off-site and the quantity released on- and off-site each decreased by less than 100,000 pounds.

Increases from 2000 to 2001 were reported in the amount of PBT chemicals in waste used for energy recovery on-site and recycled off-site. An increase of 313,454 pounds or 3.0 percent was reported for PBT chemicals in waste used for energy recovery on-site, and the amount in waste recycled off-site increased by 215,527 pounds or 26.6 percent from 2000 to 2001.

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

As shown in Table 3-16, transfers off-site for further waste management, including disposal, of all PBT chemicals decreased from 2000 to 2001, by 2.15 million pounds or 31.8 percent. This was due primarily to a 2.13 million pound decrease in other off-site transfers to disposal. Such transfers decreased by 44.4 percent. Transfers to treatment of PBT chemicals also decreased from 2000 to 2001, by 183,518 pounds or 22.1 percent, and transfers to energy recovery decreased by 88,295 pounds or 31.1 percent.

Increases were reported in the amount of PBT chemicals in transfers to recycling. Such transfers increased by 257,051 pounds or 31.2 percent. Transfers to POTWs of PBT chemicals also

Table 3-16: TRI Transfers Off-site for Further Waste Management, including Disposal, PBT Chemicals, 2000-2001

	2000 Pounds	2001 Pounds	Change 2000-2001 Pounds	Change 2000-2001 Percent
Transfers to Recycling	824,296.58	1,081,347.89	257,051.30	31.2
Transfers to Energy Recovery	283,588.28	195,292 86	-88,295.42	-31.1
Transfers to Treatment	828,708.36	645,190.15	-183,518.21	-22.1
Transfers to POTWs	5,798 26	6,891.33	1,093.07	18 9
Metals and Metal Category Compounds Only	413.09	469.60	56.51	13.7
Non-metal TRI Chemicals	5,385 17	6,421.73	1,036 56	19 2
Other Off-site Transfers*	12.00	1,497.92	1,485 92	12,382.7
Other Off-site Transfers to Disposal**	4,807,181 32	2,672,893 39	-2,134,287.94	-44 4
Total Transfers for Further Waste Management, including Disposal	**6,749,584.80**	**4,603,113.53**	**-2,146,471.27**	**-31.8**

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

Table 3-17: TRI Total Releases of PBT Chemicals by Agency, 2000-2001: Federal Facilities

Federal Agency	Total On- and Off-site Releases			
	2000	2001	Change 2000-2001	
	Pounds	Pounds	Pounds	Percent
Department of Defense	262.50	33,627.01	33,364.51	12,710.1
Air Force	39.34	20.75	-18 60	-47 3
Army	209.81	279.71	69.90	33.3
Navy	13 35	33,326.56	33,313.21	249,606.3
Department of Energy	3,909.97	1,636.99	-2,272.98	-58.1
Department of Transportation	68 34	0.09	-68.25	-99 9
Department of Veterans Affairs	3,653.00	3,436.00	-217.00	-5 9
Environmental Protection Agency	0 00	0 00	0.00	--
Environmental Protection Agency	0.00	0.00	0.00	--
US EPA Fund-Lead Superfund Sites	0 00	0.00	0.00	--
Tennessee Valley Authority	8,082.99	11,339.31	3,256 32	40.3
US Enrichment Corporation	11 20	0.00	-11.20	-100.0
Total for Federal Facilities	**15,988.00**	**50,039.40**	**34,051.40**	**213.0**

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

increased from 2000 to 2001, by 1,093 pounds or 18.9 percent.

TRI FEDERAL FACILITIES' DATA FOR PBT CHEMICALS, 2000-2001

Comparisons of TRI data for PBT chemicals from 2000 to 2001 do not include data on lead and lead compounds because lower reporting thresholds for these chemicals only became effective for 2001.

On- and Off-site Releases, 2000-2001

From 2000 to 2001, on- and off-site releases of PBT chemicals reported by federal agencies increased by over 200 percent, from 15,988 pounds to 50,039 pounds (see Table 3-17). Most of the increase was due to the increase of 33,313 pounds reported by Navy facilities. Tennessee Valley Authority facilities also reported an increase, of 40.3 percent or 3,256 pounds. The Army also had an increase of almost 70 pounds.

Other federal agencies reported decreases in PBT chemicals from 2000 to 2001. The Department of Energy facilities reported a decrease of 58.1 percent, or 2,273 pounds.

Waste Management Data, 2000-2001

Quantities of TRI Chemicals in Waste, 2000-2001

Total production-related waste of PBT chemicals managed by federal facilities increased from 26,976 pounds to 78,925 pounds from 2000 to 2001 (see Table 3-18). This represented an almost 200 percent

Table 3-18: TRI Total Production-related Waste Managed of PBT Chemicals by Agency, 2000-2001: Federal Facilities

Federal Agency	Total Production-related Waste Managed			
	2000	2001	Change 2000-2001	
	Pounds	Pounds	Pounds	Percent
Department of Defense	540.62	33,809.13	33,268.51	6,153.8
Air Force	39 48	20.73	-18.75	-47 5
Army	357.33	436.01	78.68	22 0
Navy	143.81	33,352 39	33,208.59	23,092 6
Department of Energy	14,134.31	29,376.52	15,242.21	107 8
Department of Transportation	195.73	0 09	-195.64	-99 95
Department of Veterans Affairs	3,653.00	3,436.00	-217.00	-5.9
Environmental Protection Agency	324.90	317 63	-7 27	-2 2
Environmental Protection Agency	324 90	317.63	-7 27	-2.2
US EPA Fund-Lead Superfund Sites	0 00	0 00	0 00	--
Tennessee Valley Authority	8,116.33	11,985.35	3,869 02	47.7
US Enrichment Corporation	11.20	0 00	-11 20	-100.0
Total for Federal Facilities	**26,976.09**	**78,924.72**	**51,948.63**	**192.6**

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

increase. Most of the increase came from Navy facilities, which reported increases of PBT chemicals of 33,209 pounds, after reporting 144 pounds of PBT chemicals in waste in 2000. Department of Energy (DOE) facilities also reported increases, of 15,242 pounds. From 2000 to 2001, DOE facilities more than doubled the amount of PBT chemicals in waste managed by these facilities. Tennessee Valley Authority facilities reported increases of 47.7 percent, from 8,116 pounds to 11,985 pounds.

PBT chemicals in waste managed by most other federal agencies decreased from 2000 to 2001. The Department of Veterans Affairs reported a decrease of 217 pounds, or 5.9 percent. The Department of Transportation reported a decrease of 196 pounds, or over 99.9 percent.

Dioxin and Dioxin-like Compounds

INTRODUCTION

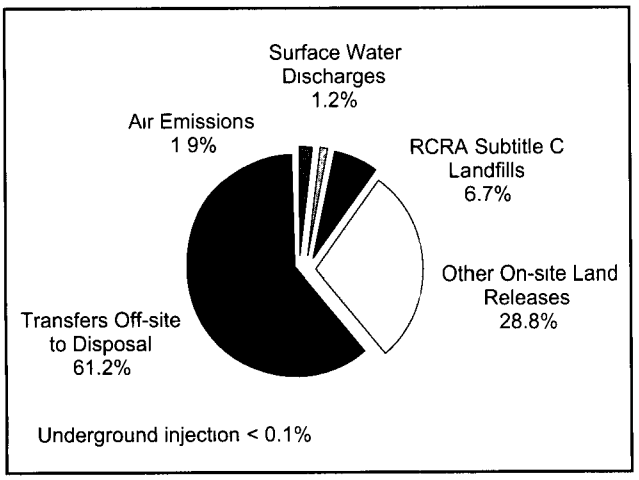
"Dioxins" refers to a group of chemical compounds that share similar chemical and biological properties. These toxic compounds are members of closely related families: the chlorinated dibenzo-p-dioxins (CDDs) and chlorinated dibenzofurans (CDFs). There are 75 congeners, or related individual compounds, of CDDs and 135 congeners of CDFs (EPA, OEI, September 1999). Of these 210 congeners, seven CDD congeners and ten CDF congeners are thought to exhibit some degree of toxicity. These 17 toxic congeners all have four chlorine atoms attached to the main dioxin or furan molecule in the 2, 3, 7, and 8 positions. The TRI category, dioxin and dioxin-like compounds, includes these 17 dioxins and furans.

Although similar in other ways all dioxin-like compounds do not have the same level of toxicity. As a result, a toxicity equivalency procedure was developed to quantify the toxicity of these compounds relative to each other for risk assessment purposes. It should be noted that these factors do not relate the toxicity of these chemicals to other chemicals (e.g., benzene). The most well-studied and one of the most toxic dioxin compounds is 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD). 2,3,7,8-TCDD is given the base toxicity equivalence factor (TEF) of 1.0. Each of the other sixteen 2,3,7,8-CDD/CDF congeners is then assigned its own toxicity equivalence factor based on estimates of its toxicity relative to that of "dioxin". The TEFs of the other dioxin-like compounds range from 1 to 0.0001. These TEF values have been adopted by international convention and are listed in Box 3-2.

Box 3-2: Dioxin and Dioxin-like Compounds Category and Corresponding TEF Values

CAS Number	Chemical Name	TEF
	CDDs	
1746-01-6	2,3,7,8-tetrachlorodibenzo-p-dioxin	1
40321-76-4	1,2,3,7,8-pentachlorodibenzo-p-dioxin	1
39227-28-6	1,2,3,4,7,8-hexachlorodibenzo-p-dioxin	0.1
57653-85-7	1,2,3,6,7,8-hexachlorodibenzo-p-dioxin	0.1
19408-74-3	1,2,3,7,8,9-hexachlorodibenzo-p-dioxin	0.1
35822-46-9	1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin	0.01
3268-87-9	1,2,3,4,6,7,8,9-octachlorodibenzo-p-dioxin	0.0001
	CDFs	
51207-31-9	2,3,7,8-tetrachlorodibenzofuran	0.1
57117-41-6	1,2,3,7,8-pentachlorodibenzofuran	0.05
57117-31-4	2,3,4,7,8-pentachlorodibenzofuran	0.5
70648-26-9	1,2,3,4,7,8-hexachlorodibenzofuran	0.1
57117-44-9	1,2,3,6,7,8-hexachlorodibenzofuran	0.1
72918-21-9	1,2,3,7,8,9-hexachlorodibenzofuran	0.1
60851-34-5	2,3,4,6,7,8-hexachlorodibenzofuran	0.1
67562-39-4	1,2,3,4,6,7,8-heptachlorodibenzofuran	0.01
55673-89-7	1,2,3,4,7,8,9-heptachlorodibenzofuran	0.01
39001-02-0	1,2,3,4,6,7,8,9-octachlorodibenzofuran	0.0001

Figure 3-1: Distribution of TRI On-site and Off-site Releases, 2001: Dioxin and Dioxin-like Compounds



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.

Revisions of TEFs may periodically occur as new scientific data becomes available. Dioxin-like compounds are often found in complex mixtures. The relative toxicity of such a mixture is known as its toxic equivalency (TEQ). This is calculated by first multiplying the concentrations of the individual congeners by their respective TEFs then summing together the products to find the overall TEQ of the mixture.

Dioxin and dioxin-like compounds, like other TRI chemicals, are reported as quantities. In addition, however, the distribution of the members of the category is also reported.

More details on dioxin and dioxin-like compounds, their sources, chemical characteristics, health and environmental effects and efforts being undertaken to reduce pollution from dioxins can be found in the *2000 Toxics Release Inventory Public Data Release Report* (EPA 260-R-02-003).

2001 TRI DATA FOR DIOXIN AND DIOXIN-LIKE COMPOUNDS

On-site and Off-site Releases, 2001

As shown in Table 3-19, there were 1,320 TRI forms submitted for dioxin and dioxin-like compounds for 2001. On- and off-site releases for dioxin and dioxin-like compounds totaled 148,759 grams. Over half of total releases were released off-site as transfers to disposal, which totaled 91,101 grams or 61.2 percent (see Figure 3-1). The second largest release type was other on-site land releases (that is, other than RCRA subtitle C landfills), which totaled 42,808 grams. (Types of on-site land releases are described in Box 1-4 in Chapter 1.)

Much smaller amounts of other types of releases were reported. On-site land releases to RCRA subtitle C landfills in 2001 totaled 9,964 grams or 6.7 percent of total releases. Air emissions were 2,888 grams, and surface water discharges were 1,851 grams. On-site releases to underground injection of dioxin and dioxin-like compounds were 148 grams.

Waste Management Data, 2001

Quantities of TRI Chemicals in Waste

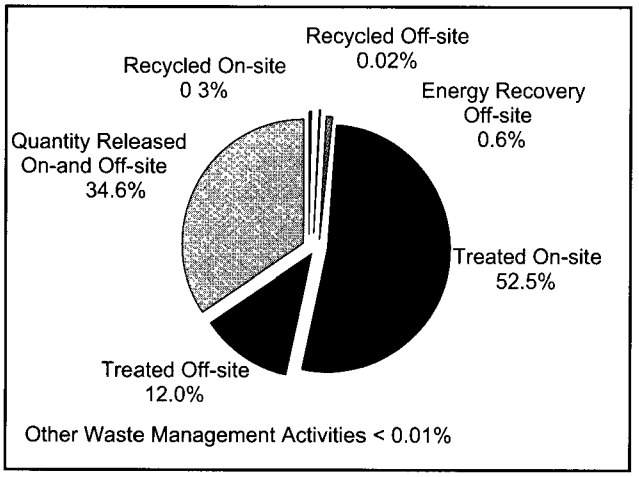
Dioxin and dioxin-like compounds in production-related waste totaled 446,649 grams in 2001, as shown in Table 3-20. A little more than half of this (234,296 grams or 52.5 percent) was treated on-site (see Figure 3-2). The quantity released on- and off-site totaled 154,421 grams or over one-third of the dioxin and dioxin-like compounds in production-

Table 3-19: TRI On-site and Off-site Releases, 2001: Dioxin and Dioxin-like Compounds

			On-site Releases							Off-site Releases	Total
					Underground Injection		On-site Land Releases				
CAS Number	Chemical	Total Forms	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	On- and Off-site Releases
		Number	Grams	Grams	Grams	Grams	Grams	Grams	Grams	Grams	Grams
--	Dioxin and dioxin-like compounds	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

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

Figure 3-2: Distribution of Quantities of TRI Chemicals in Waste, 2001: Dioxin and Dioxin-like Compounds



Note: Data are from Section 8 of Form R.

related waste. A total of 53,572 grams, or 12.0 percent, of dioxin and dioxin-like compounds was treated off-site. Just over 2,760 grams were in waste sent for energy recovery off-site and 1,484 grams were in waste in which the primary chemical was recycled on-site.

Transfers Off-site for Further Waste Management, including Disposal

Transfers off-site for further waste management, including disposal, of dioxin and dioxin-like compounds totaled 140,327 grams in 2001 (see Table 3-21). Other transfers off-site to disposal accounted for almost two-thirds of this amount, 91,116 grams or 64.9 percent (see Figure 3-3). Transfers to treatment accounted for 32.6 percent; the amount was 45,768 grams.

Other types of transfers off-site for further waste management and disposal in 2001 accounted for about 2.4 percent of the total. Transfers to energy recovery totaled 3,248 grams. All other types of transfers of dioxin and dioxin-like compounds totaled 195 grams in 2001.

TRI Data by State

Facilities in Texas, with 90 forms, submitted the largest number of forms in 2001 for dioxin and dioxin-like compounds. Pennsylvania and Louisiana ranked second and third, with 65 and 62 forms, respectively.

On- and Off-site Releases

In 2001, facilities in Delaware reported the largest total releases on- and off-site of dioxin and dioxin-like compounds (see Table 3-22). They reported a total of 76,715 grams, or 51.6 percent of the total for 2001. A large majority of Delaware's releases of dioxin and dioxin-like compounds were off-site releases (transfers to disposal). Delaware reported 77.8 percent of all reported off-site releases of dioxin and dioxin-like compounds in 2001.

As shown in Map 3-1, Texas and Mississippi along with Delaware reported the largest amounts of total releases of dioxin and dioxin-like compounds in 2001, with Texas reporting 28,426 grams and Mississippi reporting 18,728 grams. Tennessee was ranked fourth with 11,516 grams.

Mississippi, with the third largest total releases, reported the largest amounts of other on-site land releases (that is, other than RCRA subtitle C landfills), with 18,473 grams or 43.2 percent of all such land releases of dioxin and dioxin-like compounds in 2001. Texas, with the second largest total releases, had the largest releases to on-site RCRA subtitle C landfills, amounting to 9,209 grams.

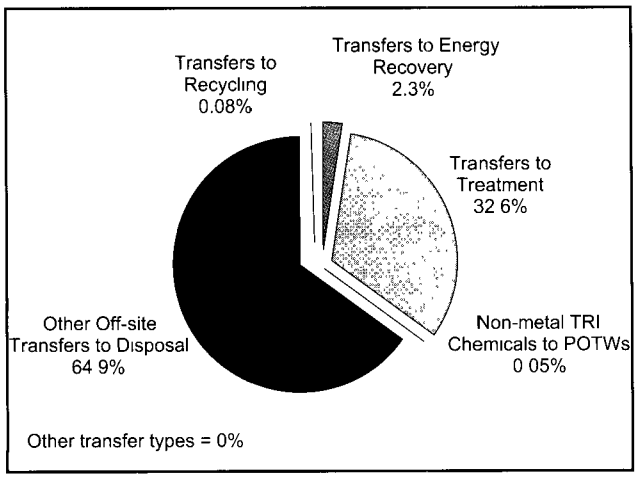
The state with the largest surface water discharges of dioxin and dioxin-like compounds in 2001 was

Table 3-20: Quantities of TRI Chemicals in Waste, 2001: Dioxin and Dioxin-like Compounds

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 Grams	Off-site Grams	On-site Grams	Off-site Grams	On-site Grams	Off-site Grams	Grams	Grams	Grams
--	Dioxin and dioxin-like compounds	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

Note: Data are from Section 8 of Form R

Figure 3-3: Distribution of TRI Transfers Off-site for Further Waste Management, including Disposal, 2001: Dioxin and Dioxin-like Compounds



Note: Transfers Off-site for Further Waste Management, including Disposal are from Section 6 of Form R

Texas with 730 grams. North Carolina reported the largest air emissions, with 497 grams.

Waste Management Data

The state with the largest quantity of dioxin and dioxin-like compounds in production-related waste in 2001 was Texas (see Table 3-23). Texas's 163,248 grams of dioxin and dioxin-like compounds in production-related waste was over two times that of any other state. Delaware ranked second with 76,731 grams. Michigan ranked third with 61,932 grams and Louisiana ranked fourth with 60,680 grams.

Texas accounted for almost half of the dioxin and dioxin-like compounds reported as treated on-site, 111,601 grams or 47.6 percent of the total. Utah facilities reported the largest amount treated off-site, 19,972 grams or 37.3 percent of the total, and Texas reported 18,431 grams treated off-site, over one-third of the total treated off-site.

The state with the largest quantity released on- and off-site was Delaware, with 76,715 grams or 49.7 percent of the total. Texas ranked second for releases on- and off-site with 33,215 grams and Mississippi was third with 18,728 grams.

TRI Data by Industry

On- and Off-site Releases

Chemical manufacturers accounted for the largest releases on- and off-site of dioxin and dioxin-like compounds in 2001 (see Table 3-24), 136,827 grams or 92.0 percent of all industry sectors reporting release of dioxin and dioxin-like compounds. The primary metals industry reported the second largest amount of releases of these compounds, 4,551 grams or 3.1 percent of total releases for all industry sectors.

The paper industry reported the third largest amount of releases, with 2,854 grams. One facility reported 2,277 grams of this as a one-time release from an old treatment system that contained dioxin and dioxin-like compounds from the time when the facility used chlorine.

The chemical industry also reported the largest amount of each individual type of release except air emissions. The largest type of release reported by the chemical industry was off-site releases

Table 3-21: TRI Transfers Off-site for Further Waste Management, including Disposal, 2001: Dioxin and Dioxin-like Compounds

CAS Number	Chemical	Transfers to Recycling Grams	Transfers to Energy Recovery Grams	Transfers to Treatment Grams	Transfers to POTWs: Metals and Metal Category Compounds Grams	Transfers to POTWs: Non-metal TRI Chemicals Grams	Other Off-site Transfers* Grams	Other Off-site Transfers to Disposal** Grams	Total Transfers for Further Waste Management, including Disposal Grams
--	Dioxin and dioxin-like compounds	118 613	3,248 079	45,767 920	0 000	76 441	0 000	91,116.041	140,327.093

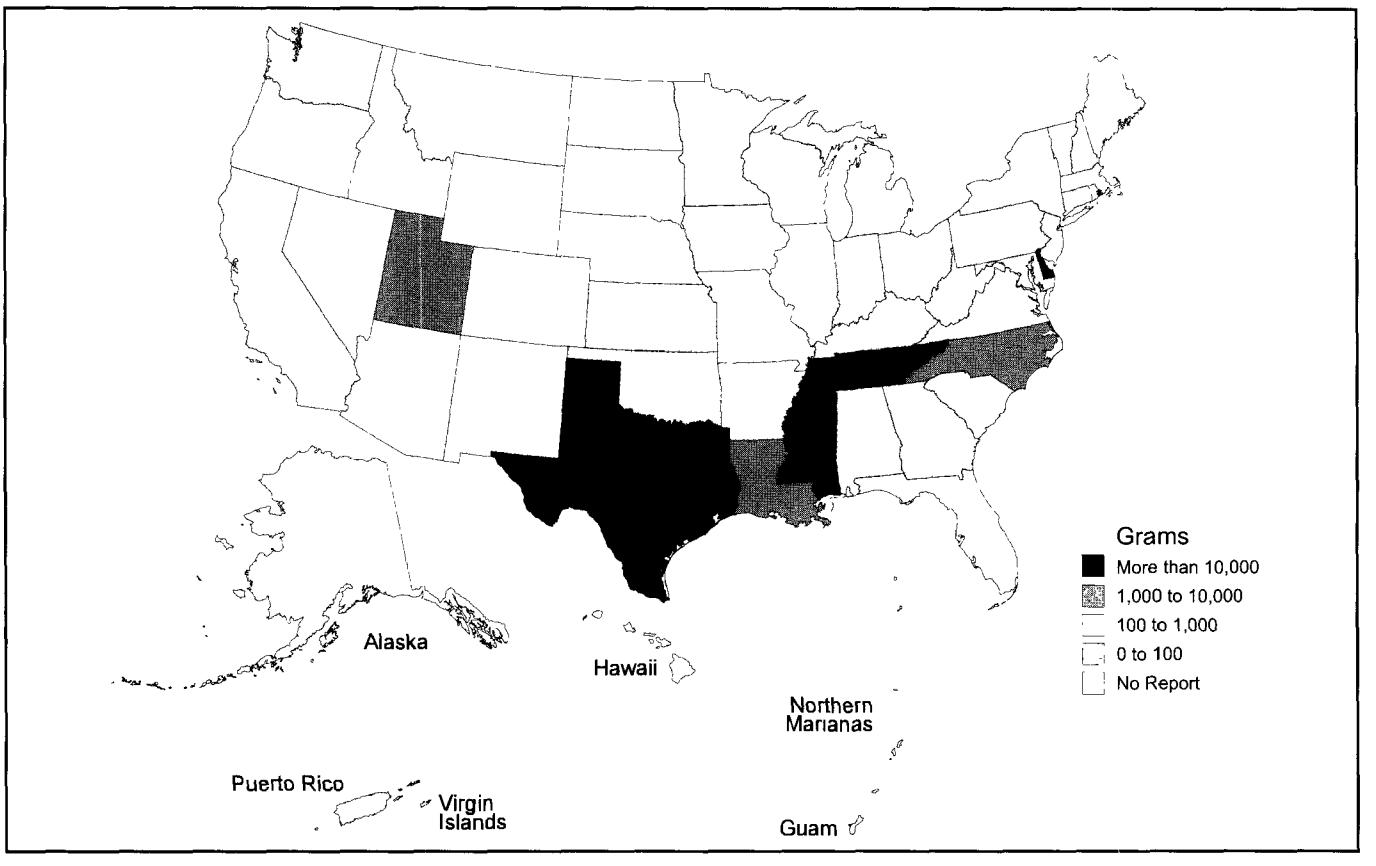
Note: Transfers Off-site for Further Waste Management, including Disposal are from Section 6 of Form R
* Other Off-site Transfers are transfers reported without a valid waste management code
** Does not include transfers to POTWs of metals and metal category compounds

Table 3-22: TRI On-site and Off-site Releases, by State, 2001: Dioxin and Dioxin-like Compounds

		On-site Releases							Off-site Releases	
				Underground Injection		On-site Land Releases				
State	Total Forms	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	Grams	Grams	Grams	Grams	Grams	Grams	Grams	Grams	Grams
Alabama	48	45.526	101 507	0.000	0 000	1.500	82 599	231.132	220 486	451 618
Alaska	6	8 369	7 540	0 000	0 000	0 000	0 000	15 909	0 000	15 909
Arizona	15	16 368	0 000	0.000	0 000	0 000	0 013	16 381	0.000	16 381
Arkansas	25	33 716	5 920	0 000	0 000	0 000	26 487	66 123	33 846	99 969
California	36	22 234	0 850	0.000	0 000	2 014	0 083	25 182	190.527	215.708
Colorado	15	5 811	0 074	0 000	0 000	0 000	0 000	5 885	6 923	12 808
Connecticut	12	7.142	1 300	0.000	0 000	0.000	0 000	8.442	1 299	9 741
Delaware	7	4 493	17 745	0 000	0 000	0 000	5,832 910	5,855 148	70,859 881	76,715 030
District of Columbia	1	0 101	0 000	0 000	0.000	0 000	0.000	0.101	0.000	0.101
Florida	46	70 154	9 134	0 000	0 000	0 000	17 897	97 185	0 000	97 185
Georgia	43	37 137	27.183	0.000	0.000	0 000	329 261	393 581	20 562	414.143
Guam	1	0 206	0 000	0 000	0 000	0 000	0 000	0 206	0 000	0 206
Hawaii	9	5 109	0 000	0.000	0 000	0 000	0 000	5.109	0 905	6.013
Idaho	6	1 695	4 178	0 000	0 000	0 000	5 766	11 638	61 510	73 148
Illinois	38	29.297	0.040	0 000	0 000	0.000	0 000	29 337	34 680	64 017
Indiana	49	184 512	0 017	0 000	0 000	0 000	122 942	307 470	233 362	540 832
Iowa	29	38 179	0 000	0.000	0 000	0 000	0 000	38 179	0 831	39.010
Kansas	18	41 008	0 000	63 751	0 000	0 000	1 540	106 299	0 000	106 299
Kentucky	34	25.040	0 022	0 000	0 450	0 000	251 055	276 567	186 119	462 686
Louisiana	62	90 930	607 364	0 130	0 000	8 200	901 671	1,608 295	1,228 593	2,836 888
Maine	16	9.385	2 107	0 000	0 000	0 000	3 409	14.901	1 927	16 827
Maryland	17	15 679	0 848	0 000	0 000	0 000	129 910	146 437	0 280	146 717
Massachusetts	8	11 451	0.100	0 000	0.000	0 000	0.000	11 551	0 223	11 774
Michigan	34	25 334	2 565	0 000	0 000	729 900	2 021	759 820	156 237	916 057
Minnesota	25	9.143	0.000	0 000	0.000	0 000	916.134	925 277	17 299	942 576
Mississippi	30	13 556	234 897	0 000	0 000	0 000	18,473 442	18,721 895	6 153	18,728 048
Missouri	37	33.200	20.393	0 000	0.000	1 370	0 018	54 981	0 158	55 138
Montana	8	17 593	0 162	0 000	0 000	0 000	0 049	17 804	0 152	17 956
Nebraska	9	3 751	0 000	0.000	0 000	0 000	1.070	4 821	0 000	4.821
Nevada	12	11 305	0 000	0 000	0 000	0 000	0 000	11 305	0 000	11 305
New Hampshire	4	214.890	0.000	0 000	0 000	0 000	0 142	215.032	0 000	215 032
New Jersey	19	8 256	0 430	0 000	0 000	1 020	0 000	9 706	33 180	42 886
New Mexico	5	5.737	0 000	0 000	0 000	0.000	0 000	5 737	0.000	5.737
New York	44	34.518	3 864	0 000	0 000	0 003	0 074	38 459	73 658	112 117
North Carolina	53	497.289	2 457	0 000	0 000	0 000	121 733	621.478	624 203	1,245.681
North Dakota	10	5 859	0 000	0 000	0 000	0 000	0 090	5 949	0 000	5 949
Ohio	61	51.529	0 756	0 000	0 000	2.200	153 491	207 976	260 014	467.990
Oklahoma	18	82 187	0 445	0 000	0 000	7 830	5 806	96 268	46 730	142 998
Oregon	20	11.536	2 985	0 000	0 000	0 000	1 101	15.621	14 477	30.098
Pennsylvania	65	205 461	0 951	0 000	0 000	0 000	5 056	211 469	168 754	380 223
Puerto Rico	8	13.227	0 003	0 000	0.000	0 000	0 000	13 229	0 424	13 653
Rhode Island	1	0.012	0 000	0 000	0 000	0 000	0 000	0 012	0 001	0 013
South Carolina	36	92 150	4 787	0 000	0 000	0 000	14 430	111 367	4 769	116 137
South Dakota	4	0 304	3 801	0 000	0 000	0 000	0 000	4 105	28 975	33 080
Tennessee	41	37.460	22 022	0 000	0 000	0 000	8,937 283	8,996 765	2,518.996	11,515 761
Texas	90	336 645	730 188	0 000	83 820	9,209 400	4,150 030	14,510 083	13,916 298	28,426 382
Utah	16	204.983	0 000	0 000	0 000	0 000	2,295 444	2,500.428	2 640	2,503.068
Vermont	1	0 858	0 000	0 000	0 000	0 000	0 000	0 858	0 000	0 858
Virgin Islands	3	1.120	0 034	0 000	0 000	0.000	0.000	1 154	0.000	1 154
Virginia	38	116 781	0 714	0 000	0 000	0 406	0 976	118 876	43 633	162 508
Washington	24	37 062	27 922	0 000	0 000	0 000	21.268	86 252	91 243	177 495
West Virginia	21	52 237	2 807	0 000	0 000	0 000	0 000	55 044	2 134	57 178
Wisconsin	33	51.997	2.763	0 000	0.000	0 000	2 354	57 113	8 726	65 839
Wyoming	9	8 048	0 000	0 000	0 000	0 000	0 000	8 048	0 000	8 048
Total	**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**

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

Map 3-1: Total On- and Off-site Releases, 2001: Dioxin and Dioxin-like Compounds



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

(transfers to disposal), with 86,209 grams of off-site releases or 94.6 percent of total off-site releases for dioxin and dioxin-like compounds in 2001. The second largest type of release for the chemical industry was other on-site land releases (that is, other than RCRA subtitle C landfills) of 38,784 grams or 90.6 percent of all such releases of dioxin and dioxin-like compounds.

Electric utilities reported the largest amount of air releases of dioxin and dioxin-like compounds in 2001 with 771 grams, accounting for 26.7 percent of all air emissions of dioxin and dioxin-like compounds from all industry sectors.

Waste Management

The chemical manufacturing industry reported the largest amount of dioxin and dioxin-like compounds in production-related waste in 2001 (see Table 3-25). With 390,833 grams of dioxin and dioxin-like compounds in production-related waste, it accounted for 87.5 percent of the total. More than half of the dioxin and dioxin-like compounds in production-related waste reported by the chemical industry (226,853 grams or 58.0 percent) was treated on-site.

The primary metals industry reported the second largest amount of dioxin and dioxin-like compounds in production-related waste, with 30,314 grams or 6.8 percent of the total for dioxin and dioxin-like compounds in 2001. The lumber industry reported the third largest amount of dioxin and dioxin-like compounds in production-related waste, with 18,391 grams or 4.1 percent of the total. Almost two thirds of the dioxin and dioxin-like compounds in production-related waste reported by the lumber industry (11,679 grams or 63.5 percent) was treated off-site.

Table 3-23: Quantities of TRI Chemicals in Waste, by State, 2001: Dioxin and Dioxin-like Compounds

State	Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
	On-site Grams	Off-site Grams	On-site Grams	Off-site Grams	On-site Grams	Off-site Grams	Grams	Grams	Grams
Alabama	190.000	0.000	0.000	778.085	760.454	222.053	421.981	2,372.573	489.033
Alaska	0 000	0 000	0 000	0 000	0.000	0 000	15.947	15 947	0.000
Arizona	32.790	0.000	0.000	0.000	0.000	0.000	16.381	49 171	2.210
Arkansas	0 500	0 056	0 000	0 000	188.362	0 000	99 953	288 871	0.000
California	0.000	98 810	0 000	1 150	49.472	63.525	215 909	428.866	0.000
Colorado	0 000	0 000	0 000	0 000	5 083	0 000	12.798	17 881	0.000
Connecticut	0 000	0 000	0 000	0.000	7.200	0.000	9.801	17.001	0.000
Delaware	0 000	0 000	0.000	0 000	0 000	15 631	76,715 030	76,730 661	0.000
District of Columbia	0.000	0.000	0.000	0.000	0 000	0.000	0 101	0.101	0.000
Florida	0 000	0 000	0 000	0 000	0 000	0 151	97 694	97.844	0 000
Georgia	0 000	0.000	0.140	800.000	148.959	46.512	409.531	1,405.142	5 074
Guam	0 000	0 000	0 000	0 000	0 000	0.000	0 206	0 206	0 000
Hawaii	0.000	0.000	0.000	0.000	0.000	0.000	6.013	6.013	0.000
Idaho	0.000	0 000	2 856	0 000	0 000	0.000	73 148	76 004	0.000
Illinois	0.000	0.001	0.000	16.000	0.000	0.605	63.817	80.423	0.000
Indiana	0 000	0 000	0 000	0 000	1,232 735	0.606	540 559	1,773 900	0.000
Iowa	0.000	0.000	0.000	0.000	0 000	0.000	38.179	38.179	0.000
Kansas	0 000	0 000	0.000	0 000	0 000	50 309	106.300	156 609	0 366
Kentucky	0 000	0.000	0.000	0.000	44.184	0.246	2,068.778	2,113 209	0 000
Louisiana	1,092 190	0 000	0 000	0 000	53,735.638	2,931 113	2,921 007	60,679.948	0 000
Maine	0 000	0.300	0.180	0 000	0.000	0.000	17.147	17.627	0.000
Maryland	0 014	0 002	1 300	0 000	0.000	0 067	146 680	148 063	0.035
Massachusetts	0.000	0.127	0 000	0.000	0.000	0.000	11.771	11.898	0.000
Michigan	0 000	0 000	0.000	0 000	61,738 700	8.237	185 520	61,932 456	729.730
Minnesota	0.000	0 028	0.000	1,160.176	119.617	41.291	942.576	2,263.688	0.010
Mississippi	21 640	0 000	0 000	3 126	8.000	3,196 409	18,728 094	21,957.268	215.000
Missouri	0.000	0.000	0.000	0.000	0.000	309.316	55.450	364.766	1.356
Montana	0 000	0 000	0.000	0.000	0 000	0 000	17 823	17.823	0 000
Nebraska	0.000	0 000	0.000	0.000	0.000	0.000	3.751	3.751	0.039
Nevada	146 903	0 000	0.000	0.000	0 002	198 333	11 105	356.343	0 000
New Hampshire	0.000	0.000	0.000	0.000	0 000	0.000	214.890	214.890	0.000
New Jersey	0.000	2.200	0.000	0.000	0 000	5 540	51.019	58.759	0 000
New Mexico	0.000	0.000	0.000	0.000	0.000	0.000	5.737	5.737	0.000
New York	0 000	0 350	1 689	0 000	1,155.070	1.900	112.657	1,271 666	8,590 000
North Carolina	0.000	0.001	0.389	0.000	13 518	392.373	1,180.298	1,586.579	119.457
North Dakota	0.000	0 000	0.000	0.000	0.000	0 000	5.949	5.949	0.000
Ohio	0.000	0.023	0.000	0.000	608.260	50.045	468.462	1,126.790	0.000
Oklahoma	0 000	0 000	0 000	0 000	0.000	1.477	143.039	144.516	0.000
Oregon	0 000	0.013	0.000	0 000	9.200	1,279.521	32.444	1,321.178	42.064
Pennsylvania	0 000	0 461	4 962	0 000	9 160	0.904	380.507	395 993	0 000
Puerto Rico	0.000	0.000	0.000	0.000	0.000	0.000	13.653	13.653	0.000
Rhode Island	0 000	0 000	0.000	0.000	0 000	0.000	0 013	0 013	0.000
South Carolina	0 000	0.000	0.000	1 865	11.041	5,638.650	116.663	5,768.219	0.000
South Dakota	0.000	0 000	0.000	0.000	0.000	237.933	33 080	271.012	0.000
Tennessee	0.000	0.284	0 000	0 000	2,529 442	2 062	11,519.071	14,050.858	2,277.000
Texas	0 000	0 200	0 000	0 000	111,601 322	18,431 312	33,214 745	163,247.579	741.505
Utah	0.000	0.000	0.000	0.000	6.980	19,972.000	2,503 081	22,482.061	0.000
Vermont	0 000	0.000	0.000	0 000	0 000	0 000	0.858	0 858	0 000
Virgin Islands	0 000	0.000	0.000	0.000	0.000	0.000	1.154	1.154	0.000
Virginia	0.000	0 000	0 000	0 000	0 000	0 000	163.216	163 216	0 000
Washington	0.160	0.000	0.008	0.000	179.042	473.484	175.599	828.292	0.010
West Virginia	0 000	0 000	0 000	0 000	0 004	0 407	57.164	57.575	0.000
Wisconsin	0.000	0.014	0.000	0.000	134.921	0 000	66.809	201 744	0.000
Wyoming	0.000	0 000	0 000	0 000	0 000	0 000	8.047	8 047	0 000
Total	**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**

Note: Data are from Section 8 of Form R

Table 3-24: TRI On-site and Off-site Releases, by Industry, 2001: Dioxin and Dioxin-like Compounds

			On-site Releases							Off-site Releases	
					Underground Injection		On-site Land Releases				
SIC Code	Industry	Total Forms	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	Grams	Grams	Grams	Grams	Grams	Grams	Grams	Grams	Grams
10	Metal Mining	11	10 777	0 015	0 000	0 000	0 000	11 180	21 972	0 000	21 972
12	Coal Mining	1	0 000	0 000	0 000	0 000	0 000	21 706	21 706	0 000	21 706
20	Food	24	8 045	0 000	0 000	0 000	0 000	0 088	8 133	0 135	8 268
21	Tobacco	1	0 390	0 000	0 000	0 000	0 000	0 000	0 390	0 000	0 390
22	Textiles	1	0 100	0 000	0 000	0 000	0 000	0 000	0 100	0 000	0 100
24	Lumber	125	349 471	404 008	0 000	0 000	0 000	9 796	763 275	932 735	1,696 010
25	Furniture	8	116 469	0 000	0 000	0 000	0 000	0 000	116 469	0 000	116 469
26	Paper	166	111 395	84 142	0 000	0 000	0 406	286 878	482 821	2,370 729	2,853 550
28	Chemicals	139	405 026	1,340 958	63 881	83 820	9,940 323	38,784 447	50,618 456	86,208 587	136,827 043
29	Petroleum	63	24 115	6 444	0 000	0 000	0 000	5 444	36 003	15 514	51 517
30	Plastics	2	214 402	0 000	0 000	0 000	0 000	0 142	214 544	0 000	214 544
31	Leather	1	0 015	0 000	0 000	0 000	0 000	0 000	0 015	0 000	0 015
32	Stone/Clay/Glass	108	257 509	0 000	0 000	0 450	0 000	13 695	271 654	0 080	271 734
33	Primary Metals	121	469 880	0 030	0 000	0 000	1 370	2,739 270	3,210 550	1,340 465	4,551 015
34	Fabricated Metals	1	0 035	0 000	0 000	0 000	0 000	0 000	0 035	0 000	0 035
35	Machinery	1	0 214	0 000	0 000	0 000	0 000	0 000	0 214	0 000	0 214
37	Transportation Equip	4	0 829	0 000	0 000	0 000	0 000	0 000	0 829	0 000	0 829
38	Measure/Photo	1	3 340	3 200	0 000	0 000	0 000	0 002	6 542	1 956	8 498
--	Multiple codes 20-39	37	108 412	4 522	0 000	0 000	0 000	12 036	124 970	181 782	306 751
--	No codes 20-39	7	6 729	7 540	0 000	0 000	0 000	0 000	14 269	0 000	14 269
491/493	Electric Utilities	482	770 976	0 010	0 000	0 000	0 000	921 804	1,692 791	8 094	1,700.884
5169	Chemical Wholesale Distributors	1	4 864	0 000	0 000	0 000	0 000	0 000	4 864	10 780	15 644
5171	Petroleum Terminals/Bulk Storage	1	0 000	0 000	0 000	0 000	0 000	0 000	0 000	0 000	0 000
7389/4953	Hazardous Waste/Solvent Recovery	14	24 574	0 000	0 000	0 000	21 744	1 070	47 388	29 948	77 335
	Total	**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**

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

Projected Quantities of TRI Chemicals Managed in Waste, 2001-2003

TRI facilities expected to decrease their dioxin and dioxin-like compounds in production-related waste between 2001 and 2002 by 9.2 percent, from 446,649 grams to 405,777 grams (see Table 3-26). The decrease was projected to occur primarily in quantities reported as being treated on-site and in the quantity released on- and off-site. From 2002 to 2003, a decrease of 22.8 percent was projected, resulting in a total decrease from 2001 to 2003 of 29.9 percent. Decreases were expected to occur primarily in amounts treated on-site and in the quantity released on- and off-site.

The amount of dioxin and dioxin-like compounds in production-related waste increased 23.5 percent between the prior year of 2000 and 2001, with reported amounts going from 361,556 grams to 446,649 grams. The quantity released on- and off-site increased by the largest amount, 67,516 grams or 77.7 percent. It is expected to continue increasing through 2002 and then decrease in 2003.

Source Reduction

In 2001, 68 forms were filed reporting source reduction activities for dioxin and dioxin-like compounds (see Table 3-27). As noted in **Waste Management** in Chapter 1, source reduction—an activity that prevents the generation of waste—is preferred to waste management. These 68 forms represented 5.2 percent of all forms submitted for dioxin and dioxin-like compounds in 2001.

The most frequently reported source reduction activity was good operating practices (listed on 23 forms). Process modifications came next, with 16 forms, followed by raw materials modifications, with 12 forms.

On- and Off-site Releases, 2000-2001

On- and off-site releases of dioxin and dioxin-like compounds in 2001 were 148,759 grams, an

Table 3-25: Quantities of TRI Chemicals in Waste, by Industry, 2001: Dioxin and Dioxin-like Compounds

SIC Code	Industry	Recycled On-site Grams	Recycled Off-site Grams	Energy Recovery On-site Grams	Energy Recovery Off-site Grams	Treated On-site Grams	Treated Off-site Grams	Quantity Released On- and Off-site Grams	Total Production-related Waste Managed Grams	Non-production-related Waste Managed Grams
10	Metal Mining	0 000	0 000	0.000	0.000	0 003	0 000	21 972	21.975	0 000
12	Coal Mining	0 000	0 000	0 000	0 000	0 000	0 000	21 706	21 706	0 000
20	Food	0 000	0.000	0 000	0.000	0 000	0.554	8 268	8.822	0 000
21	Tobacco	0 000	0 000	0 000	0 000	0 000	0 000	0 390	0 390	0 000
22	Textiles	0 000	0 000	0 000	0 000	0 000	0.000	0 100	0.100	0 000
24	Lumber	1,450 703	0 280	0 000	2,741 388	851 632	11,678 996	1,667 540	18,390 540	751 028
25	Furniture	0 000	0 000	0 000	0 000	0 000	0.000	170 601	170.601	0 000
26	Paper	0 000	1 304	5 679	0 000	473 026	8 757	2,746 019	3,234 784	2,397 977
28	Chemicals	0 514	0 285	1 300	19 015	226,853 141	21,471 800	142,486 721	390,832 777	10,061 031
29	Petroleum	0 190	0 001	0 000	0 000	22 592	12 978	151 942	187 704	0 104
30	Plastics	0 000	0 000	0 000	0 000	0 000	0 000	214.402	214 402	0 000
31	Leather	0 000	0 000	0 000	0 000	0 000	0 000	0 015	0 015	0 000
32	Stone/Clay/Glass	0 000	0 000	1.689	0 000	0 000	0.000	267.617	269 306	0 466
33	Primary Metals	32 790	2 200	0 000	0 000	5,747 618	19,986 728	4,544 909	30,314 245	0 000
34	Fabricated Metals	0 000	0 000	0 000	0 000	0 000	0.000	0.000	0 000	0 035
35	Machinery	0 000	0 000	0 000	0 000	0 000	0 000	0 214	0 214	0 000
37	Transportation Equip	0 000	0 000	0 000	0 000	0 000	0 000	0.829	0 829	0.000
38	Measure/Photo	0 000	0 000	0 000	0 000	35 000	0 000	8 500	43 500	0 000
--	Multiple codes 20-39	0.000	0 000	2 856	0 000	43 230	19 907	301 545	367 538	0.039
--	No codes 20-39	0 000	0 000	0 000	0 000	0 000	392 289	14 307	406 596	0 000
491/493	Electric Utilities	0 000	98 800	0.000	0 000	0 000	0.000	1,701 692	1,800.492	2 210
5169	Chemical Wholesale Distributors	0 000	0 000	0 000	0 000	0 000	0 000	15 644	15 644	0 000
5171	Petroleum Terminals/Bulk Storage	0 000	0 000	0 000	0.000	0.000	0.000	0.000	0.000	0.000
7389/4953	Hazardous Waste/Solvent Recovery	0 000	0 000	0 000	0 000	270 122	0 000	76 268	346 390	0 000
	Total	**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**

Note: Data are from Section 8 of Form R

Table 3-26: Prior Year, Current Year and Projected Quantities of TRI Chemicals in Waste, 2000-2003: Dioxin and Dioxin-like Compounds

Waste Management Activity	Prior Year 2000 Total Grams	Prior Year 2000 Percent of Total	Current Year 2001 Total Grams	Current Year 2001 Percent of Total	Projected 2002 Total Grams	Projected 2002 Percent of Total	Projected 2003 Total Grams	Projected 2003 Percent of Total
Recycled On-site	4,448 637	1.2	1,484.197	0 3	1,360.764	0.3	1,360.845	0 4
Recycled Off-site	8,935 037	2 5	102 870	0 0	102 900	0 0	102 931	0 0
Energy Recovery On-site	24.271	0.0	11.524	0.0	10.161	0 0	9.861	0.0
Energy Recovery Off-site	1,367 318	0 4	2,760 403	0 6	1,822 856	0 4	1,822 856	0 6
Treated On-site	238,362 567	65 9	234,296.365	52 5	203,543.753	50 2	163,036.642	52 1
Treated Off-site	21,512 614	6 0	53,572 009	12 0	41,421 285	10 2	41,716.100	13 3
Quantity Released On- and Off-site	86,905 616	24.0	154,421.201	34 6	157,515 450	38.8	105,012.770	33 5
Total Production-related Waste Managed	**361,556.059**	**100.0**	**446,648.570**	**100.0**	**405,777.169**	**100.0**	**313,062.004**	**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	-66 6	-8 3	0 0	-8.3
Recycled Off-site	-98 8	0 0	0 0	0 1
Energy Recovery On-site	-52.5	-11 8	-3 0	-14 4
Energy Recovery Off-site	101 9	-34 0	0 0	-34 0
Treated On-site	-1 7	-13.1	-19.9	-30 4
Treated Off-site	149 0	-22 7	0 7	-22.1
Quantity Released On- and Off-site	77.7	2.0	-33.3	-32.0
Total Production-related Waste Managed	**23.5**	**-9.2**	**-22.8**	**-29.9**

Note: Data from Section 8 of Form R for 2001

Table 3-27: Number of Forms Reporting Source Reduction Activity, by Category, 2001: Dioxin and Dioxin-like Compounds

CAS Number	Chemical	Total Form Rs Number	Forms Reporting Source Reduction Activity: Number	Percent of All Form Rs Percent	Category of Source Reduction Activity: Good Operating Practices Number	Inventory Control Number	Spill and Leak Prevention Number	Raw Materials Modifications Number	Process Modifications Number	Cleaning and Degreasing Number	Surface Preparation and Finishing Number	Product Modifications Number
--	Dioxin and dioxin-like compounds	1,320	68	5 2	23	7	8	12	16	0	1	1

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

increase of 49,714 grams or 50.2 percent from 2000 (see Table 3-28). On-site releases increased by 29.6 percent and off-site releases (transfers to disposal) increased by 36,548 grams or 67.0 percent.

The increase in on-site releases was due to increases in on-site land releases, which increased by 14,536 grams or 38 percent. This included an increase of 5,060 grams in releases to RCRA subtitle C landfills and 9,476 grams to other on-site landfills.

The increase in off-site releases (transfers to disposal) was primarily due to the increase in transfers to landfills/surface impoundments. These transfers increased by over 300 percent, or by 43,614 grams.

Other types of releases of dioxin and dioxin-like compounds decreased from 2000 to 2001. On-site air releases decreased by 902 grams or 23.8 percent, surface water discharges decreased by 211 grams or 10.2 percent and underground injection decreased by 257 grams or 63.4 percent.

Waste Management Data, 2000-2001

Quantities of TRI Chemicals in Waste, 2000-2001

Dioxin and dioxin-like compounds in production-related waste increased from 386,920 grams in 2000 to 446,649 grams in 2001, an increase of 15.4 percent (see Table 3-29). The quantity released on- and off-site increased by 55,676 grams or 56.4 percent and the amount treated off-site increased by 21,427 grams or 66.7 percent.

Decreases were reported in the amount of dioxin and dioxin-like compounds in waste treated on-site, a decrease of 15,247 grams or 6.1 percent. The amount of dioxin and dioxin-like compounds in waste recycled on-site also decreased, by 2,964 grams or 66.6 percent.

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

As shown in Table 3-30, transfers off-site for further waste management, including disposal, of dioxin and dioxin-like compounds increased from 2000 to 2001, by 25,034 grams or 21.7 percent. Other off-site transfers to disposal increased by 36,519 grams or 66.9 percent. Dioxin and dioxin-like compounds in waste sent for energy recovery also increased, by 1,069 grams or 49.1 percent.

Decreases were reported in the amount of dioxin and dioxin-like compounds in waste sent off-site for treatment. Transfers to treatment decreased by 12,614 grams or 21.6 percent. Other decreases reported were in transfers of non-metal TRI chemicals to POTWs, of 45 grams.

Table 3-28: TRI On-site and Off-site Releases, 2000-2001: Dioxin and Dioxin-like Compounds

	2000	2001	Change 2000-2001	
	Number	Number	Number	Percent
Forms	1,309	1,320	11	0.8
	Grams	Grams	Grams	Percent
Total Air Emissions	3,789.081	2,887 566	-901.515	-23.8
Surface Water Discharges	2,061.866	1,850 869	-210 997	-10 2
Underground Injection	405.192	148.151	-257.040	-63.4
Class I Wells	284.112	63.881	-220.230	-77 5
Class II-V Wells	121.080	84.270	-36.810	-30.4
On-site Land Releases	38,235.732	52,771.401	14,535.668	38 0
RCRA Subtitle C Landfills	4,903.737	9,963.843	5,060.106	103.2
Other On-site Land Releases	33,331.995	42,807.558	9,475 563	28.4
Total On-site Releases	**44,491.872**	**57,657.988**	**13,166.116**	**29.6**
Storage Only*	747.498	626.014	-121.484	-16 3
Solidification/Stabilization**	0.000	0.000	0.000	--
Metals and Metal Category Compounds Only	0.000			
Wastewater Treatment (Excluding POTWs)***	0.000	0.000	0 000	--
Metals and Metal Category Compounds Only				
Transfers to POTWs****	0.000	0.000	0.000	--
Metals and Metal Category Compounds Only				
Underground Injection	0.002	227 542	227.540	11,149,457.8
Landfills/Surface Impoundments	14,392.764	58,006.294	43,613.530	303 0
Land Treatment	7.037	1.068	-5.970	-84.8
Other Land Disposal	56 486	66.248	9.762	17 3
Other Off-site Management	38,684.082	31,309.922	-7,374.160	-19.1
Transfers to Waste Broker for Disposal	663.733	859.350	195 617	29.5
Unknown*****	1.265	4.368	3.103	245.2
Total Off-site Releases (Transfers Off-site to Disposal)	**54,552.868**	**91,100.805**	**36,547.938**	**67.0**
Total On- and Off-site Releases	**99,044.739**	**148,758.793**	**49,714.054**	**50.2**

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 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)

Table 3-29: Quantities of TRI Chemicals in Waste by Waste Management Activity, 2000-2001: Dioxin and Dioxin-like Compounds

Waste Management Activity	2000	2001	Change 2000-2001	
	Grams	Grams	Grams	Percent
Recycled On-site	4,448.624	1,484.197	-2,964.427	-66.6
Recycled Off-site	21.942	102.870	80.928	368.8
Energy Recovery On-site	21.426	11.524	-9.902	-46 2
Energy Recovery Off-site	1,994.612	2,760.403	765.791	38 4
Treated On-site	249,543.109	234,296.365	-15,246.745	-6 1
Treated Off-site	32,144.789	53,572.009	21,427 221	66 7
Quantity Released On- and Off-site	98,745.115	154,421.201	55,676.086	56.4
Total Production-related Waste Managed	**386,919.617**	**446,648.570**	**59,728.953**	**15.4**
Non-production-related Waste Managed	26,821.006	13,212.890	-13,608.117	-50.7

Note: Data are from Section 8 of Form R of year indicated

Table 3-30: TRI Transfers Off-site for Further Waste Management, including Disposal, 2000-2001: Dioxin and Dioxin-like Compounds

	2000	2001	Change 2000-2001	
	Grams	Grams	Grams	Percent
Transfers to Recycling	12 700	118 613	105.913	834 0
Transfers to Energy Recovery	2,178 711	3,248 079	1,069 368	49 1
Transfers to Treatment	58,382.169	45,767.920	-12,614.250	-21.6
Transfers to POTWs	121 869	76 441	-45 428	-37 3
Metals and Metal Category Compounds	0.000	0.000	0 000	--
Non-metal TRI Chemicals	121 869	76 441	-45 428	-37 3
Other Off-site Transfers*	0.000	0 000	0.000	--
Other Off-site Transfers to Disposal**	54,597 527	91,116 041	36,518 514	66 9
Total Transfers for Further Waste Management, including Disposal	**115,292.977**	**140,327.093**	**25,034.116**	**21.7**

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

Lead and Lead Compounds

INTRODUCTION

Lead (CAS 7439-92-1) is a heavy, silver-white metal in its pure (elemental) form. When exposed to air, it reacts with it and turns bluish-gray. Its physical properties include a relatively low melting point (327°C), high density, and an ability to shield radiation, sound waves, and mechanical vibrations. Lead exists in either one of two ways: as the pure metal (i.e., lead metal) or as a compound, in which the lead is combined with some other element or elements. Examples of lead compounds include: lead oxide, lead sulfide, and lead acetate. Lead metal and lead compounds are widely used in a variety of products and applications that include: lead-acid batteries, ammunition, construction materials, solder, metal castings, glass and ceramic products, plastics, electrical cable coverings, lubricating oils and greases, and certain paints (EPA, OPPT, October 2000). In 2001, an estimated 1,590,000 metric tons of lead were consumed in products used in the United States (USGS, 2001). Lead is also present in low concentrations in ores and fuels.

Lead is a highly toxic substance. In humans, lead is primarily toxic to the nervous system and kidneys. Exposure of the general population to lead occurs primarily from ingestion of food or nonfood items that contain lead, and from inhalation of air contaminated with lead vapors or particulate matter that contains lead. Lead and lead compounds have been listed on the EPCRA section 313 list of toxic chemicals since the list was established by Congress in 1986.

Due to the ability of lead to persist in the environment and bioaccumulate in aquatic organisms and humans, EPA finalized a rule in 2001 that designated lead and lead compounds as persistent bioaccumulative toxic (PBT) chemicals, and lowered the TRI reporting thresholds for lead and lead compounds to 100 pounds, beginning with the 2001 reporting year (EPA, OEI, January 2001). The lower threshold applies to lead and lead compounds except for lead when it is contained in stainless steel, brass, or bronze alloys (EPA, OEI, January 2001).

SOURCES AND USES

Lead is often obtained by primary production through mining of ores or by secondary production through recycling. The production of lead from ores has fallen in recent years, from 853,000 metric tons in 1999 to 744,000 metric tons in 2001. The major source of refined lead in the U.S. is recovered from lead scrap. In 2001, 1,100,000 metric tons, or 79 percent of the total lead produced domestically, was domestic refined lead recovered from lead scrap. Lead obtained from lead scrap increased from 1,110,000 metric tons in 1999 to 1,130,000 metric tons in 2000 and then fell to 1,100,000 metric tons in 2001. The 2001 domestic production of recoverable lead from lead ores was 454,000 metric tons, or 25 percent of the total lead produced domestically. An additional 290,000 metric tons of lead was recovered from ores other than lead ore, such as copper ores (USGS, 2001).

Most of the lead ore mined in the United States is mined in Alaska and the "lead-belt" in southeast Missouri (93 percent in 2001). Lead is also mined in Idaho, Montana, Nevada and New York. Lead ore is mined underground except when it is mined with copper ores, which are typically mined in open pits. The lead content of ores generally ranges from 3 to 8 percent, and is usually in the form of a lead compound. Lead ore concentrates are processed at primary lead smelter/refinery plants to produce lead metal or alloys (EPA, OEI, December 2001).

Currently, there are twelve lead-producing mines in the United States operated by six companies, including Teck Cominco Alaska Inc., Kennecott Greens Creek Mining Co. in Alaska, and Doe Run

Resources Corp. in Missouri. Two smelter-refinery operations in Missouri run by Doe Run Resources Corp. process the lead ore and recover lead from lead scrap, yielding an estimated 490,000 tons of refined lead and lead alloy products in 2001. ASARCO Inc. (owned by Grupo Mexico, S.A. de C.V.) suspended operations of its lead smelter in East Helena, Montana during 2001, citing increased production costs, poor market conditions and a decrease in the supply of lead concentrate feed for the smelter. In prior years, this smelter had produced an average of 75,000 tons per year of lead bullion (USGS, 2001).

Lead is among the most recycled of nonferrous metals in the world. Secondary production (from recycled materials) accounted for approximately 79 percent of domestic lead production in 2001. While 17 companies produced secondary lead in 2001, almost all the secondary lead (99 percent) was produced by 7 companies operating 15 plants in Alabama, California, Florida, Indiana, Louisiana, Minnesota, Missouri, New York, Pennsylvania, Tennessee, and Texas. Nearly 91 percent of all secondary lead is generated from scrap lead-acid batteries (USGS, 2001). Furnaces are used to reduce lead compounds in scrap lead to elemental lead, which may then be refined or alloyed (EPA, OAQPS, May 1998).

Lead and lead compounds are used in the manufacture of a variety of products. The most prominent uses of lead and lead compounds are in storage batteries, pigments and ceramic products, ammunition, sheet lead, casting metal and solder. The manufacture of batteries represents the largest commercial use of lead and lead compounds in the United States, accounting for 87 percent (1,390,000 metric tons) of lead consumption in 2001 (USGS, 2001). Lead and lead compounds are used in batteries because of the ability of lead to resist the corrosiveness of sulfuric acid and because it is an inexpensive material. Lead-antimony alloys are typically used for the internal grid of the battery, as well as for the posts connecting the battery to the apparatus being powered. Lead-acid batteries are used for starting, lighting, ignition (SLI) in automobiles and other mobile devices, and other stationary industrial uses such as uninterruptible power sources for hospitals and computer networks (EPA, OPPT, October 2000).

Lead is also used extensively in the ceramics industry. Lead compounds are incorporated into glazes and enamels applied to a variety of ceramic products to enhance physical performance. Lead additives improve the durability, color, scratch resistance, and bonding of the glaze. Lead content in foodware ceramics, however, is restricted by governmental regulations to reduce health hazards posed by lead. Lead is also used extensively in the glass industry for many of its physical properties, including high density and ability to absorb radiation (television and X-ray shielding), excellent insulation and low melting point (fluorescent lights and neon signs), and high index of refraction (optical glass) (EPA, OPPT, October 2000). Lead used in ceramics and pigments in paint accounted for 43,900 metric tons of lead consumption in products during 2001 (USGS, 2001).

Lead is commonly the primary constituent of the bullet portion of most rifle and pistol ammunition. Lead is well suited for this purpose because of its high density and softness. The concentration of lead in lead bullets typically ranges between 99.7 to 99.9 percent. However, lead is sometimes alloyed with antimony, tin, or arsenic to increase the melting temperature, hardness, or surface tension of bullets or pellets (EPA, OPPT, October 2000). In 2001, 53,600 metric tons of lead were consumed for the production of lead bullets. Most of this lead was obtained from secondary (recycled) sources (USGS, 2001).

Various other industries use or make metal products that contain lead and lead compounds. These metal products include sheet lead, casting metals, solder, bearing metals, extruded products, and brass and bronze alloys. Lead is incorporated because of its malleability, ability to absorb radiation, density, and lubrication properties (EPA, OPPT, October 2000). In 2001, 88,400 metric tons of lead in such products were used (USGS, 2001).

The process of mining and refining lead, or producing or using the products that contain lead may result in releases of lead into the environment. While lead was eliminated from gasoline used to power automobiles, certain fuels (e.g., fuels used in aviation) still contain lead and continue to serve as a source of lead air emissions. Incineration of waste containing lead can also be a source of air emissions of lead, as lead cannot be destroyed during incineration, but instead will volatilize into the atmosphere.

Aside from the Toxics Release Inventory database, no other source is available that provides comprehensive, multimedia, national facility-reported releases and other waste management quantities of lead. However, using a "top-down" emission factor approach, EPA has estimated that in 1996 approximately 7.8 million pounds of lead were released to air by anthropogenic sources in the U.S. Of this amount, 58.1 percent (4.5 million pounds) was estimated to be emitted from manufacturing sources, including smelting and refining, 28.5 percent (2.2 million pounds) resulted from waste or fossil fuel combustion at point sources, and 13.4 percent (1.0 million pounds) was generated from mobile sources (EPA, OPPT, October 2000).

CHEMICAL CHARACTERISTICS

Persistence and Bioaccumulation

Lead is a metal and, as with all metals, cannot be destroyed. Lead persists indefinitely in the environment as either the pure metal, or in the form of a lead compound (A general discussion on the environmental fate of lead is provided in the next section.)

Lead is quite toxic to humans and other mammals. Lead has no known biological function in any living organism. Lead can be taken up by a variety of aquatic and terrestrial organisms, and accumulate in these organisms. For example, lead and certain lead compounds (i.e., lead salts) have bioconcentration factor (BCF) or bioaccumulation factor (BAF) values that range from 1,000 to 5,000 or greater in some aquatic organisms that include snails, algae and mussels. These and the other organisms are part of the food web. Lead that has accumulated within them can serve as a source of exposure to organisms to which lead is toxic (EPA, OEI, January 2001).

Humans exposed to lead will also bioaccumulate the lead. The bioaccumulation of lead in humans and the effects that such accumulation can have on human health is well documented. To summarize the many studies regarding the uptake and disposition of lead in humans, the results of these studies show or at least indicate that: 1) lead is absorbed by humans; 2) a significant portion of that quantity which is absorbed accumulates within the skeleton; 3) lead can remain in bone for many years; 4) chronic exposure to low levels of lead from environmental sources results in a continual build-up (accumulation) of lead in the human body, and this build-up is likely to continue for at least several years; and 5) lead which has accumulated in bone can later be reabsorbed from the bone (especially during periods of increased bone mineral loss (such as occurs during pregnancy, breast feeding, menopause, and old age), and enter the systemic circulation and partition to organs and other tissues to which lead is toxic. This latter scenario is particularly likely to occur when the individual has an increased demand for calcium (e.g., during pregnancy). There is evidence that suggests infants, children and African Americans may be especially susceptible to bioaccumulating lead, and certain genetic factors may increase an individual's susceptibility to accumulating lead.

Environmental Fate and Transport

Lead released into the environment in the form of lead metal or a lead compound may remain as such or convert to another lead compound. As with many metals, the specific form or forms in which lead will exist in a given locality depend largely on the prevailing environmental conditions of that locality.

Lead particles in the environment can attach to dust and be carried long distances in the air, and then subsequently deposited on surface soils and waters.

Once lead is deposited onto soil, it usually adheres to the soil particles. Lead can remain in soils for many years (EPA, OAQPS, November 2000). Release of the lead from the soil particles will depend on the type of lead compound and on the physical and chemical characteristics of the soil (ATSDR, August 1997). However, even lead that is bound in soils can still be absorbed by humans. Children are particularly susceptible to exposure to lead because they often play in dirt and lead is absorbed more efficiently by children than adults.

Lead may be mobile in soils under a range of environmental conditions. Variables including soil pH, soil organic matter content and the particular form(s) of lead present in soil play a significant role in the mobility of lead in soil. The degree to which lead sorbs to soil organic matter has been shown to be dependent on soil acidity. An increase in soil acidity (i.e., a decrease in soil pH) will cause lead bound to soil organic matter to become unbound, and can cause the concentrations of lead in soil water to increase. On the other hand, a decrease in soil acidity (i.e., an increase in soil pH) will cause lead in soil water to become bound to soil organic matter and, consequently, cause a decrease in the concentration of lead in soil water.

Lead bound to soil particles in water is unlikely to end up in underground water or drinking water unless the water is acidic. Small amounts of lead may enter rivers, lakes, and streams when soil particles from the land run-off into water bodies during rainstorms. Lead compounds present in water may combine with different chemicals depending on the acidity and temperature of the water (ATSDR, August 1997).

HEALTH AND ENVIRONMENTAL EFFECTS

Humans, animals and fish are mainly exposed to lead by breathing and ingesting it in food, water, soil, or dust, as it can be absorbed into the body from the lungs and from the gastrointestinal tract. Infants and young children are especially susceptible to the toxic effects caused by lead, even at low levels of exposure (EPA, OAQPS, November 2000).

The toxic effects of lead are the same whether it enters the body through inhalation or ingestion. Lead mainly affects the nervous system and kidneys in adults, fetuses, infants and children. Long-term exposure of adults to lead at work has resulted in decreased performance in some tests that measure functions of the nervous system. Lead exposure may also cause weakness in fingers, wrists, or ankles, or cause anemia. At higher levels of exposure, lead can severely damage the brain and kidneys in adults, fetuses, infants and children. In pregnant women, high levels of exposure to lead may cause miscarriage (ATSDR. August 1997).

Fetuses, infants and children are more sensitive to the toxic effects of lead than are adults. A child who ingests a significant amount of lead may develop anemia, kidney damage, colic, muscle weakness, and brain damage. If smaller amounts are ingested, much less severe effects on blood and brain function may occur. At still lower levels of exposure, lead can affect a child's mental and physical growth. Fetuses exposed to lead may be born prematurely and have lower weights at birth. Exposure in the womb, in infancy, or in early childhood may also slow mental development and lower intelligence later in childhood (ATSDR, August 1997).

Elevated levels of lead in water can cause reproductive damage in some aquatic species and, in others, blood and neurological changes. Wild and domestic animals may ingest lead while grazing. They experience the same kind of effects as people who are exposed to lead (EPA, OAQPS, November 2000).

EFFORTS TO REDUCE POLLUTION FROM THE CHEMICAL

Over the last 25 years, EPA has taken numerous steps to reduce and control lead in the environment in order to reduce exposure to lead. For example, in the early 1970s, EPA set national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. The use of leaded gasoline in highway vehicles was banned by EPA in 1995 (EPA, OAQPS, November 2000).

EPA set national air quality standards for lead in 1978. EPA's lead air quality monitoring strategy focuses on areas surrounding industrial sources of lead such as primary and secondary lead smelters and battery manufacturers. Areas that have lead levels that exceed acceptable levels must develop and implement a plan to reduce their air emissions of lead (EPA, OAQPS, November 2000). EPA also has standards aimed to reduce air emissions (including lead) from medical waste incinerators, municipal waste combustors, and hazardous waste incinerators (EPA, OPPT, October 2000).

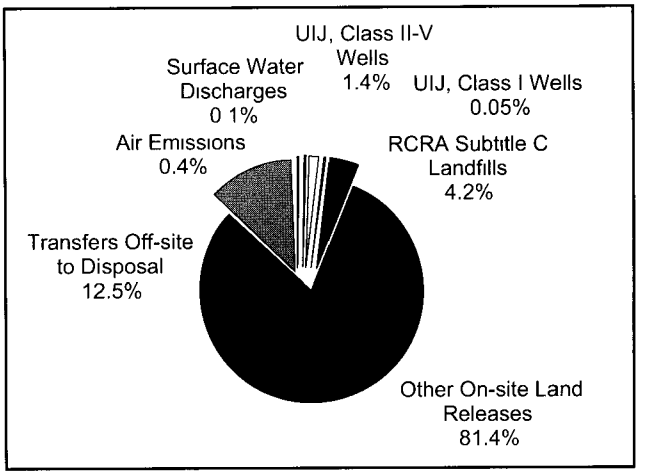
In 1978, EPA banned the use of lead in most paints, including paints used in residential structures (e.g., houses). Therefore, homes built after 1978 should not contain lead-based paints, except in those homes built within a few years after 1978 in which surplus supplies of lead-based paints may have been used. Federal regulations require a person selling a home to disclose any known lead-based hazards on the property (ATSDR, August 1997). The use of lead in solder for cans is banned, and lead content in dishes and other eating utensils is restricted. EPA's Lead Awareness Program (http://www.epa.gov/lead/leadpbed.htm) develops regulations, conducts research, and designs educational materials and outreach efforts in a continuing program to protect human health.

2001 TRI DATA FOR LEAD AND LEAD COMPOUNDS

On-site and Off-site Releases, 2001

As shown in Table 3-31, there were 8,561 TRI forms submitted for lead and lead compounds for 2001. On- and off-site releases of lead and lead compounds totaled 443.0 million pounds, with 422.2 million pounds of this reported as lead compounds. On-site releases represented 87.5 percent of total releases of lead and lead compounds, and off-site releases represented 12.5 percent in 2001.

Figure 3-4: Distribution of TRI On-site and Off-site Releases, 2001: Lead and Lead Compounds



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

More than 80 percent of total releases of lead and lead compounds were other on-site land releases (that is, other than RCRA subtitle C landfills), which totaled 360.8 million pounds (see Figure 3-4). (Types of on-site land releases are described in Box 1-4 in Chapter 1.)

The second-largest release type was off-site releases (transfers to disposal), which totaled 55.3 million

Table 3-31: TRI On-site and Off-site Releases, 2001: Lead and Lead Compounds

			On-site Releases							Off-site Releases	
					Underground Injection		On-site Land Releases				
CAS Number	Chemical	Total Forms	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
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
	Total	**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**

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

Table 3-32: TRI On-site and Off-site Releases, by Type of On- and Off-site Release, 2001: Lead and Lead Compounds

	2001	
	Pounds	Percent
On-site Releases		
Total Air Emissions	1,633,121.66	0.4
Surface Water Discharges	413,419 80	0 1
Underground Injection	6,232,821.34	1.4
Class I Wells	206,138.00	0 0
Class II-V Wells	6,026,683.34	1.4
On-site Land Releases	379,419,874.53	85 6
RCRA Subtitle C Landfills	18,610,199.14	4.2
Other On-site Land Releases	360,809,675 39	81 4
Total On-site Releases	**387,699,237.33**	**87.5**
Off-site Releases		
Storage Only*	288,904.99	0.1
Solidification/Stabilization**	19,575,554.32	4 4
Metals and Metal Category Compounds Only		
Wastewater Treatment (Excluding POTWs)***	87,994 96	0.0
Metals and Metal Category Compounds Only		
Transfers to POTWs****	48,948 57	0 0
Metals and Metal Category Compounds Only		
Underground Injection	11,775.02	0.0
Landfills/Surface Impoundments	31,332,076.12	7.1
Land Treatment	122,449 04	0 0
Other Land Disposal	421,613 66	0.1
Other Off-site Management	680,228 12	0 2
Transfers to Waste Broker for Disposal	1,943,805.59	0.4
Unknown*****	779,120 56	0 2
Total Off-site Releases (Transfers Off-site to Disposal)	**55,292,470.94**	**12.5**
Total On- and Off-site Releases	**442,991,708.27**	**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 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)

pounds and accounted for 12.5 percent of total releases. Off-site releases were mainly transfers to landfills/surface impoundments and to solidification/stabilization (see Table 3-32). Transfers of lead and lead compounds in 2001 to landfills/surface impoundments totaled 31.3 million pounds and those to solidification/stabilization were 19.6 million pounds.

Smaller amounts from other types of releases of lead or lead compounds were reported. On-site land releases to RCRA subtitle C landfills were 18.6 million pounds (4.2 percent of total releases), underground injection of lead and lead compounds was 6.0 million pounds to Class II-V wells and 206,138 pounds to Class I wells. Air emissions were 1.6 million pounds and surface water discharges were 413,420 pounds.

Waste Management Data, 2001

Quantities of TRI Chemicals in Waste

The total amount of lead (from both lead metal and lead compounds) reported as being in production-related waste in 2001 was 1.23 billion pounds, as shown in Table 3-33. Over 78 percent of this quantity of lead was reported as having come from lead compounds.

Over 44 percent (543.7 million pounds) of the lead and lead compounds in total production-related waste was recycled on-site (see Figure 3-5). An additional 258.8 million pounds (21.0 percent) was recycled off-site. Over one-third of the lead and lead compounds in production-related waste (428.7 million pounds) was released on- and off-site in 2001. Other types of waste management accounted for less than one percent of the total.

Transfers Off-site for Further Waste Management, including Disposal

Transfers off-site for further waste management, including disposal, of lead and lead compounds totaled 320.2 million pounds in 2001 (see Table 3-34). Transfers of lead compounds accounted for 78.7 percent of the total.

Transfers to recycling were 255.5 million pounds or 79.8 percent of all transfers for further waste management, including disposal, and other transfers off-site to disposal were 64.6 million pounds or 20.2 percent (see Figure 3-6). Other types of transfers off-site for further waste management, including disposal, of lead and lead compounds totaled less than one percent of the total for 2001.

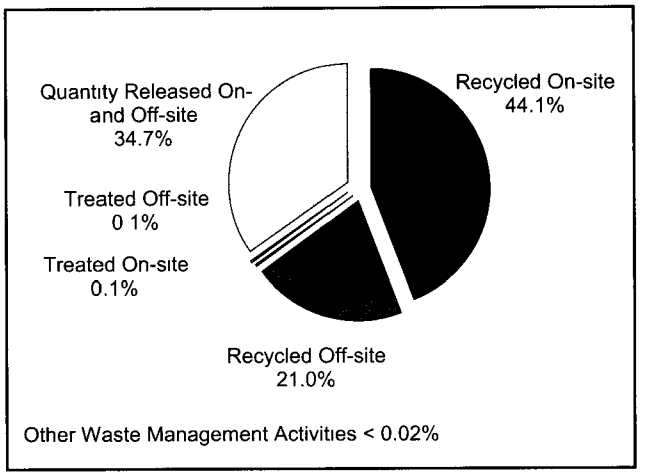
TRI Data by State

Facilities in California and Ohio submitted more than 600 forms each for lead and lead compounds in 2001. These two states submitted more forms for lead and compounds than any other state. Pennsylvania, Texas and Illinois each submitted more than 400 forms.

On- and Off-site Releases

In 2001, facilities in Alaska reported the largest total on- and off-site releases of lead and lead compounds (see Table 3-35). They reported a total of 145.2 million pounds, or almost one-third of the total for lead and lead compounds in 2001. Facilities in Utah reported the second largest amount, 95.2 million pounds or 21.5 percent.

Figure 3-5: Distribution of Quantities of TRI Chemicals in Waste, 2001: Lead and Lead Compounds



Note: Data are from Section 8 of Form R

Almost all of Alaska's releases of lead and lead compounds were as other on-site land releases (that is, other than RCRA subtitle C landfills). Such releases for Alaska were 139.2 million pounds or 38.6 percent of all such on-site land releases of lead and lead compounds in 2001. Alaska also reported 6.0 million pounds of underground injection to Class II-V wells, almost all of the underground injection releases reported in 2001.

New Jersey facilities reported the largest amount of off-site releases (transfers to disposal) of any state, with 18.8 million pounds or 34.0 percent of total off-site releases of lead and lead compounds in 2001. Missouri facilities reported the largest air emissions, with 442,978 pounds or 27.1 percent of

Table 3-33: Quantities of TRI Chemicals in Waste, 2001: Lead and Lead Compounds

CAS Number	Chemical	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On- and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-production-related Waste Managed Pounds
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
	Total	**543,676,920.88**	**258,775,081.96**	**96,065.61**	**119,025.67**	**1,259,679.53**	**1,002,539.67**	**428,651,479.57**	**1,233,580,792.90**	**18,333,736.00**

Note: Data are from Section 8 of Form R

all air emissions of lead and lead compounds in 2001.

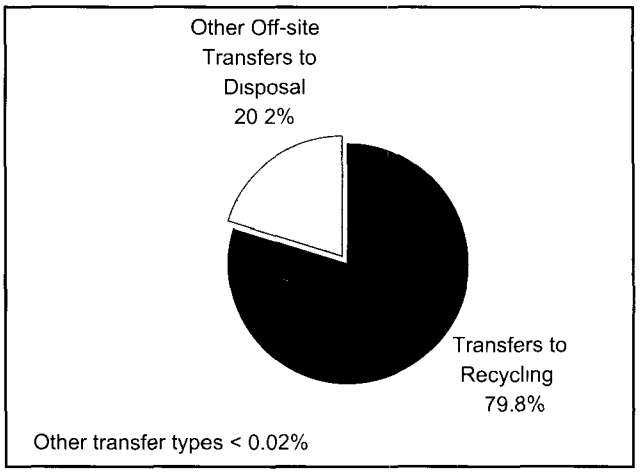
As shown in Map 3-2, releases of lead and lead compounds are quite concentrated geographically. The top two states, Alaska and Utah, released 240.4 million pounds of the 443.0 million-pound total. Facilities in Nevada and Missouri released the next largest amounts of lead and lead compounds: each released between 30 and 40 million pounds, about one-quarter of the amount released by Alaska and 40 percent of the amount released by Utah, the state with the second largest releases.

Waste Management Data

The state with the largest quantity of total production-related waste of lead and lead compounds in 2001 was Missouri (see Table 3-36). Missouri's 190.1 million pounds of total production-related waste accounted for 15.4 percent of the total. Minnesota ranked second with 148.6 million pounds (12.1 percent of the total), and Alaska ranked third with 145.0 million pounds (11.8 percent of the total).

Minnesota, the second-ranked state for lead and lead compounds in production-related waste, reported the largest amount of lead and lead compounds recycled on-site, 145.1 million pounds or 26.7 percent of all on-site recycling. Missouri, the top ranked for total production-related waste, reported the second largest amount recycled on-site, with 141.2 million pounds or 26.0 percent of all on-site recycling. Together these two states reported more than half of all on-site recycling of lead and lead compounds in 2001.

Figure 3-6: Distribution of TRI Transfers Off-site for Further Waste Management, including Disposal, 2001: Lead and Lead Compounds



Note: Transfers Off-site for Further Waste Management, including Disposal are from Section 6 of Form R

Alaska reported the largest quantity of lead and lead compounds released on- and off-site in 2001, almost 144.9 million pounds or 33.8 percent of all lead and lead compounds releases in 2001. Utah reported the second largest quantity released on- and off-site, 94.6 million pounds or 22.1 percent.

TRI Data by Industry

On- and Off-site Releases

Metal mining facilities reported the largest total releases of lead and lead compounds in 2001, 335.4 million pounds or 75.7 percent of the total on- and

Table 3-34: TRI Transfers Off-site for Further Waste Management, including Disposal, 2001: Lead and Lead Compounds

CAS Number	Chemical	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs: Metals and Metal Category Compounds Pounds	Transfers to POTWs: Non-metal TRI Chemicals Pounds	Other Off-site Transfers* Pounds	Other Off-site Transfers to Disposal** Pounds	Total Transfers for Further Waste Management, including Disposal Pounds
7439-92-1	Lead	61,903,264 25	473 99	12,123 68	18,798 10	0 00	9,938 44	6,212,706 53	68,157,304 99
--	Lead compounds	193,631,495 88	7,455 80	11,296 80	30,150 46	0 00	4,518 09	58,396,721 76	252,081,638 79
	Total	**255,534,760.13**	**7,929.79**	**23,420.48**	**48,948.57**	**0.00**	**14,456.53**	**64,609,428.29**	**320,238,943.78**

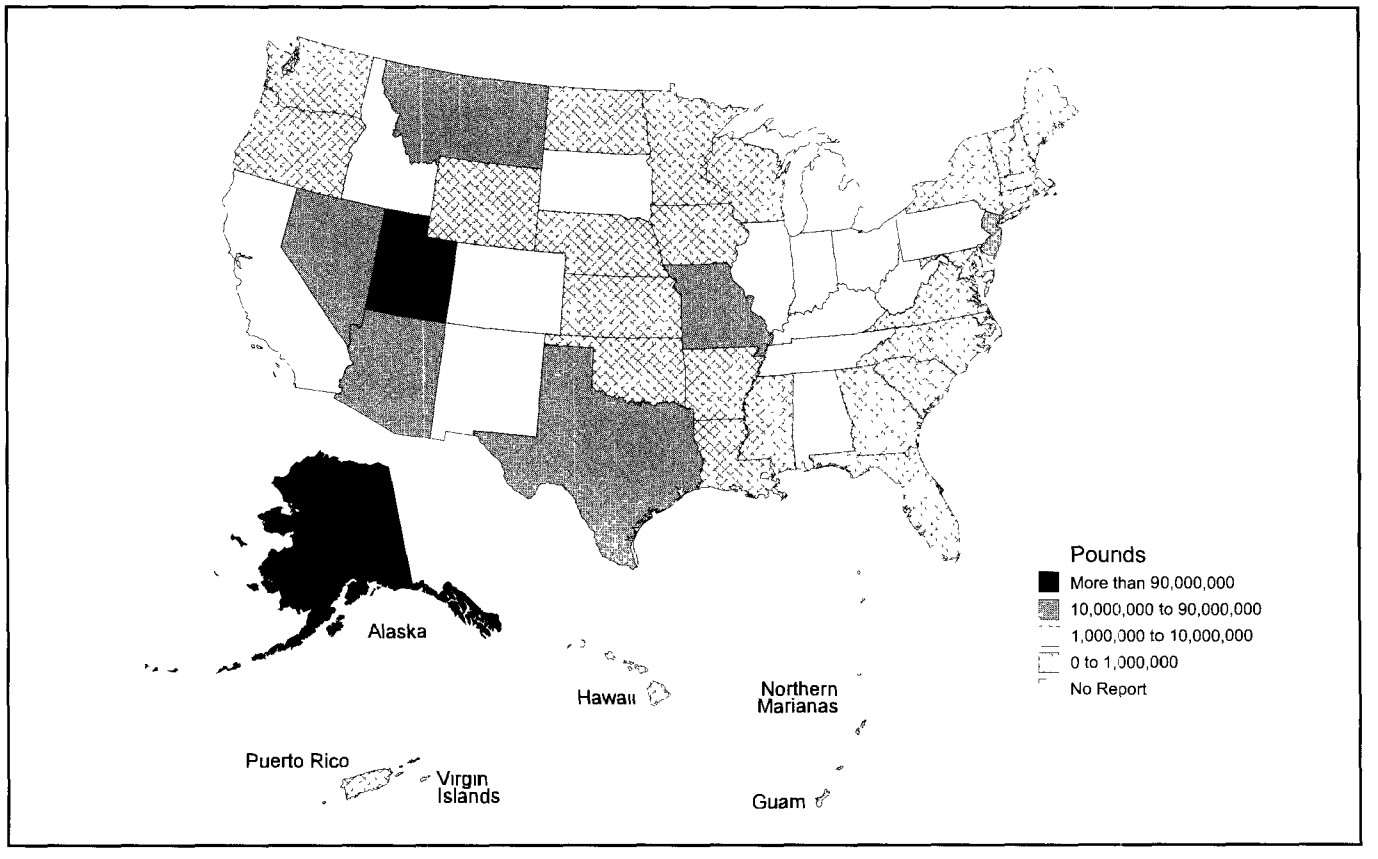
Note: Transfers Off-site for Further Waste Management, including Disposal are from Section 6 of Form R
* Other Off-site Transfers are transfers reported without a valid waste management code
** Does not include transfers to POTWs of metals and metal category compounds

Table 3-35: TRI On-site and Off-site Releases, by State, 2001: Lead and Lead Compounds

		On-site Releases							Off-site Releases	Total
				Underground Injection		On-site Land Releases				
State	Total Forms	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	On- and Off-site Releases
	Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Alabama	217	42,763 07	6,519 26	0 00	6,900 00	970,000.00	897,205 65	1,923,387.98	404,317 32	2,327,705 31
Alaska	20	11,733 10	126 40	0 00	6,000,000 00	0 00	139,186,450 40	145,198,309 90	1,162 30	145,199,472 20
Arizona	106	31,848 65	7 01	0 00	0 00	1,736 45	11,179,647.08	11,213,239.19	66,571.18	11,279,810 37
Arkansas	116	28,458 61	1,592 75	0 00	0 00	38,013 70	100,970 87	169,035 94	533,107 40	702,143 34
California	617	35,478 68	927 47	0 00	8 40	5,916,945 31	542,240.29	6,495,600.15	185,742 53	6,681,342 68
Colorado	102	32,837 26	286 57	0 00	0 00	17,937 50	3,875,220 67	3,926,282 00	93,042 12	4,019,324 12
Connecticut	149	3,391 52	607.55	0.00	0 00	0.00	1,258 05	5,257.12	718,548 80	723,805 92
Delaware	20	3,811 01	3,566 90	0 00	0 00	0 00	21,453 00	28,830.91	59,114 44	87,945 35
District of Columbia	2	0 00	0.00	0 00	0.00	0 00	0.00	0.00	956.70	956 70
Florida	233	25,984 32	1,369 53	0 00	0 00	17,829 60	405,161 25	450,344 70	287,361 46	737,706 16
Georgia	204	32,908.27	2,403 98	0 00	0 01	0.00	591,967.76	627,280.01	82,433 46	709,713 48
Guam	6	31 00	1 00	0 00	0 00	0 00	5,514 30	5,546.30	0 00	5,546 30
Hawaii	24	5,171 60	20.50	0 00	4 28	0.00	77,022 00	82,218.38	5,256 32	87,474 70
Idaho	43	2,114 97	1,294 98	0 00	0 00	3,503,180 00	3,440,272 35	6,946,862 30	71,774 15	7,018,636 45
Illinois	438	49,707 60	5,435 64	0 00	0 00	1,500,380.10	423,937 22	1,979,460.57	732,786.66	2,712,247 23
Indiana	388	55,968 98	256,269 55	1,300 00	139 90	1,006 00	1,003,819 20	1,318,503.63	3,365,542 17	4,684,045 80
Iowa	117	31,777.83	2,080 88	0.00	0 00	0.00	146,756.26	180,614.96	217,779 50	398,394.46
Kansas	87	31,916 87	28 98	0 00	0 00	0 00	112,668 50	144,614.35	44,020 65	188,634 99
Kentucky	190	34,787.17	8,416.28	0 00	0 55	0.00	1,064,819 30	1,108,023.30	143,322 87	1,251,346 17
Louisiana	101	42,666 63	10,433 28	0 00	0 00	250,001 00	407,654 95	710,755 85	141,110 56	851,866 41
Maine	51	2,108 68	1,808 28	0 00	0.00	0 00	6,515 70	10,432.66	297,291.99	307,724 65
Maryland	66	6,186 45	1,127 91	0 00	111 00	0 00	117,887 80	125,313 16	82,572 82	207,885 98
Massachusetts	255	2,551.59	32 70	0.00	0 00	452 02	5,588 03	8,624 34	302,429.60	311,053 94
Michigan	333	44,664 38	5,122 51	2 00	0 00	405,568 28	236,912 30	692,269 46	1,154,842 59	1,847,112 05
Minnesota	159	18,794 84	806.18	0 00	0.00	0.00	183,037 06	202,638 08	476,125 75	678,763 83
Mississippi	126	11,938 39	1,223 53	188,000 00	0 00	4,197 00	132,178 67	337,537 59	60,133 89	397,671 48
Missouri	204	442,978.38	3,786.42	0.00	0 00	44,269 00	27,918,861 47	28,409,895.27	3,534,045 28	31,943,940 55
Montana	26	7,241 08	373 20	0 00	10,813 00	0 00	14,137,538 70	14,155,965 98	748,749 58	14,904,715 56
Nebraska	65	15,597 05	100 81	0 00	0.00	0.00	84,026 23	99,724.08	47,120 65	146,844.74
Nevada	58	5,607 14	48 00	0 00	0 10	1,247,647 00	36,740,319 30	37,993,621 54	1,126 95	37,994,748 49
New Hampshire	74	352 09	116 10	0.00	0 00	0 00	412 00	880 19	49,775 47	50,655 66
New Jersey	183	9,087 54	797 45	0 00	0 00	4,912 10	40,932 24	55,729 33	18,774,307 45	18,830,036 78
New Mexico	37	4,098.27	50.70	0 00	0 00	0 00	7,131,885 30	7,136,034.27	39,169 47	7,175,203.73
New York	293	31,988 54	18,103 84	0 00	0 00	7,587 99	128,164 63	185,844 99	345,301 90	531,146 89
North Carolina	298	21,161.13	2,387 20	0 00	0 00	250 00	571,755.54	595,553.87	394,694 76	990,248.63
North Dakota	17	8,350 25	451 60	0 00	0 00	0 00	105,540 60	114,342 45	76,440 90	190,783 35
Northern Marianas	3	3.00	0 00	0 00	0 00	0.00	1 80	4 80	0 00	4 80
Ohio	601	91,216 91	5,746 63	15,000 00	0 00	2,243,405 13	806,775 13	3,162,143 79	3,039,116 87	6,201,260 67
Oklahoma	101	14,152.97	279 41	562 00	0 00	408,824 00	32,746 41	456,564.79	81,653.81	538,218 60
Oregon	109	7,720 61	3,106 74	0 00	0 00	786,190 79	96,045 92	893,064 06	41,780 91	934,844 96
Pennsylvania	480	87,374 40	6,318.16	0 00	0 00	243,930 30	900,485 04	1,238,107 90	3,401,219 74	4,639,327 65
Puerto Rico	43	9,904 60	424 30	0 00	0 00	0 00	8,669 50	18,998 40	6,653 04	25,651 44
Rhode Island	57	464.46	14 00	0 00	0 00	0 00	0 00	478.46	12,072 72	12,551.18
South Carolina	174	21,657 20	1,734 82	0 00	0 00	1,579 00	311,112 32	336,083 34	354,420 89	690,504 23
South Dakota	37	1,586.35	631 61	0 00	8,700.00	0 00	2,986,703.50	2,997,621 46	1,371 46	2,998,992 92
Tennessee	207	37,493 83	5,906 22	0 00	0 00	156 00	6,230,820 28	6,274,376 33	759,411 60	7,033,787 94
Texas	455	101,192.30	4,946 44	1,274 00	0.00	357,618.30	1,270,500 19	1,735,531 24	12,638,803 93	14,374,335 17
Utah	67	8,176 67	439 70	0 00	0 00	626,767 00	94,449,800 80	95,085,184 16	130,691 52	95,215,875 68
Vermont	18	295.58	2.00	0 00	0 00	178 00	0 30	475 88	22,721 86	23,197 74
Virgin Islands	4	603 00	0 00	0 00	0 00	0 00	53 00	656 00	394.00	1,050 00
Virginia	208	44,927 13	5,733 69	0 00	0 00	826 00	368,092 84	419,579 66	569,987 92	989,567 58
Washington	152	7,793 82	6,930 86	0 00	6 10	4,731 93	240,068 42	259,531 12	166,372 75	425,903 88
West Virginia	77	15,314 37	27,986.61	0 00	0 00	100 00	1,861,510 42	1,904,911 40	156,499.43	2,061,410 83
Wisconsin	318	42,136 08	3,969 51	0 00	0 00	3,979 65	78,229 97	128,315 21	353,122 14	481,437 35
Wyoming	25	5,045 45	1,524 17	0.00	0 00	0 00	142,464 89	149,034 51	18,096.70	167,131 21
Total	**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**

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

Map 3-2: Total On- and Off-site Releases, 2001: Lead and Lead Compounds



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

off-site releases (see Table 3-37). Metal mining facilities reported the largest other on-site land releases (that is, land releases other than RCRA subtitle C landfills), with 329.3 million pounds or 91.3 percent of all such releases. They also reported almost all of the on-site underground injection releases.

The primary metals industry, which includes primary and secondary smelting and refining of metals, reported the second largest total releases. Their 44.3 million pounds of releases accounted for 10.0 percent of total releases of lead and lead compounds in 2001. Primary metals facilities reported the largest off-site releases (transfers to disposal) of lead and lead compounds, with 25.5 million pounds or 46.0 percent of all off-site releases.

The hazardous waste/solvent recovery industries reported the third largest total releases, with 23.3 million pounds or 5.3 percent of the total releases of lead and lead compounds in 2001. They reported the largest on-site releases to RCRA subtitle C landfills of any industry sector, with 18.0 million pounds or 96.6 percent of all such releases of lead and lead compounds.

Waste Management

The primary metals industry reported the largest amount of lead and lead compounds in production-related waste in 2001 (see Table 3-38). With 442.4 million pounds of lead and lead compounds in production-related waste, it accounted for 35.9 percent of the total. Over 83 percent of the production-related waste reported by the primary metals industry was recycled on-site.

Table 3-36: Quantities of TRI Chemicals in Waste, by State, 2001: Lead and Lead Compounds

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	16,880,973.00	4,217,110.97	0.00	0.00	1,203.00	553 00	2,574,038.89	23,673,878.86	6,611.50
Alaska	31 00	0.00	0 00	98,000 00	0 00	0 90	144,895,523.10	144,993,555 00	17 00
Arizona	2,237,341.00	927,899.13	0.00	0.00	0 00	2,071.00	11,243,590.13	14,410,901.26	1,934 80
Arkansas	1,919,821 00	4,934,245 49	0 00	2 00	93 14	57,905 80	1,801,607 57	8,713,675 00	139,401 60
California	13,423,943.09	16,982,406.16	86,586.00	0.00	1,172,649 88	54,454.06	7,162,098.59	38,882,137.78	31,282.13
Colorado	73,442 00	3,463,637 35	0.00	0.00	52.20	2 00	4,088,841.00	7,625,974 55	7,067 45
Connecticut	8,474.42	843,447.17	0.00	10.00	56.00	13,120.83	720,523.32	1,585,631.73	69,072 98
Delaware	0 00	4,567,417.70	0.00	0 00	0 00	0 00	88,328.24	4,655,745 94	0 00
District of Columbia	30 00	4,500.00	0.00	0.00	3.00	0.00	333.00	4,866.00	0.00
Florida	46,579 00	7,043,126 37	0 00	0 00	10 00	2,172 13	676,249.98	7,768,137 49	17,612 64
Georgia	1,365,679.85	11,036,626.58	0 00	35.00	25.00	1,504.10	729,326.51	13,133,197.04	5,149.10
Guam	0 00	0.00	0 00	0 00	0 00	0 00	5,546.30	5,546.30	0 00
Hawaii	115.00	16,844.20	0.00	0.00	0 00	0.00	130,492.60	147,451.80	0 00
Idaho	4,332 00	453,122 02	0 00	0 00	0 00	1 00	7,037,753.00	7,495,208 02	3,796 17
Illinois	356,705 36	10,483,124.47	0.00	0.00	3 20	38,256.40	3,405,959.27	14,284,048 71	11,728 75
Indiana	12,499,604 23	11,397,775.98	0 00	582 00	215 37	28,481 32	4,660,934 32	28,587,593 21	42,201 71
Iowa	12,823,978.90	19,069,065.95	0.00	0.00	19,960.00	832.30	975,806 32	32,889,643 47	1,675.55
Kansas	31,544,413 29	8,088,433 35	0 00	0 00	70 00	1,555 10	188,466 38	39,822,938 12	12,789 00
Kentucky	5,404,966.90	8,390,280.00	0.00	5,209.00	666.00	82,280 50	1,235,638 16	15,119,040 56	1,565.53
Louisiana	20,923,510.48	9,005,492 27	0 00	12 00	1,284 36	61 00	865,186 98	30,795,547 09	4,950 00
Maine	0.00	35,524.68	0.00	0.00	1,000.00	0 10	25,853 36	62,378 14	4,026 00
Maryland	5,526 00	288,389.05	0 00	0 00	0 00	313 00	187,566.31	481,794 36	11 00
Massachusetts	8,111.57	640,001.91	0.00	0 00	60.00	32,021.26	297,737.84	977,932.58	578.45
Michigan	1,099,544 40	2,256,668 33	0.00	238 00	1,463 90	2,235 58	1,820,067 03	5,180,217 24	8 80
Minnesota	145,090,104 63	2,904,550.01	0.00	0.00	0 00	0 00	648,885.42	148,643,540 06	36,102.00
Mississippi	7,990,926 00	7,960,901 30	0 00	0 00	36 00	147 00	420,637 23	16,372,647 53	15,890 00
Missouri	141,212,460.40	17,036,732.88	0.00	0.00	498.40	2,974.20	31,831,008.68	190,083,674.56	18,846 00
Montana	4,626,849.00	0 00	0.00	0 00	130 70	9 29	7,029,504 42	11,656,493.41	5,679,627 00
Nebraska	25.10	312,645.07	0 00	0.00	0.00	34,061.20	1,323,823 33	1,670,554.70	0.00
Nevada	1,571,119 90	677,699 40	0 00	0 00	289 00	8 94	37,984,722 33	40,233,839 57	50.00
New Hampshire	28,615.40	417,982.64	0.00	0.00	0.20	1,450.40	40,932.04	488,980.68	27,636.75
New Jersey	42,771 80	3,057,369 38	0 00	89.40	12,000 00	47,272 47	3,255,771 96	6,415,275 01	3,127 94
New Mexico	0.00	111,935.10	0.00	0.00	0 00	0.00	7,282,224.63	7,394,159 73	13,937.00
New York	6,674,447 01	5,463,899 77	119 00	3 31	69 00	23,266 40	674,231 21	12,836,035 70	31,171 90
North Carolina	130,451.29	20,599,652.73	1,153.61	1,152.96	640.00	5,207.20	975,154.91	21,713,412 71	4,731 65
North Dakota	0 00	3,646 00	0 00	0 00	0 00	0 00	190,415 07	194,061 07	0 00
Northern Marianas	0.00	0.00	0.00	0 00	0.00	0 00	4.80	4.80	0.00
Ohio	58,920,072 65	11,359,341 33	0 00	1,174 00	171 50	4,969 63	6,778,468.62	77,064,197 73	11,599 30
Oklahoma	164,370.40	1,922,782.12	0.00	3.00	4,283.00	16.42	589,256.59	2,680,711.53	12,640.21
Oregon	5,164 59	4,339,233 18	0.00	0 00	1,506 70	503 63	1,623,141 39	5,969,549 48	992 02
Pennsylvania	42,726,955.80	10,636,192.45	0.00	0 00	21,172.20	59,919.93	5,621,165.71	59,065,406.09	72,369 59
Puerto Rico	2 00	107,164.16	0 00	0 00	1 00	153 51	57,425 55	164,746 22	0 00
Rhode Island	340,100.20	79,895.31	0.00	0.00	24.00	3,009.00	11,554.70	434,583.21	0.00
South Carolina	50,270 00	5,364,629 31	0 00	3,400 00	161 56	43,065 18	4,758,489 84	10,220,015 89	30,421 29
South Dakota	20.00	788,000.72	0.00	0 00	0.00	1 00	2,999,860.03	3,787,881.75	712.00
Tennessee	10,213,746 50	26,767,580 30	0 00	686 00	1,965 00	1,357 99	7,014,707 86	44,000,043 65	1,518 01
Texas	2,662,036.39	4,273,973.18	8,207.00	2,758.00	2,148.00	445,844.87	14,526,652.27	21,921,619.71	11,010,715.40
Utah	376 50	167,257 72	0 00	0 00	7,479 86	107 29	94,640,991 47	94,816,212 84	976,041.30
Vermont	636.00	856,836.00	0.00	0 00	0.00	183.90	23,370.04	881,025.94	0 00
Virgin Islands	0 00	131 00	0 00	0 00	0 00	0 00	1,054 00	1,185 00	0 00
Virginia	41,613.60	957,727.70	0.00	3,267.00	4,752.00	293.84	989,667.80	1,997,321.94	2,193.40
Washington	14,718 50	1,053,165 56	0.00	520 00	953 80	3,411 07	483,354 59	1,556,123 52	17,691 09
West Virginia	6,756.90	137,995.95	0.00	0.00	2,477 10	771.00	1,167,664.69	1,315,665.64	3,842.00
Wisconsin	535,187 82	7,271,016 56	0 00	1,884 00	105 30	6,712 93	520,679 39	8,335,586 00	400 00
Wyoming	0.00	6.00	0.00	0.00	0.16	0.00	369,190.82	369,196.98	0 00
Total	**543,676,920.88**	**258,775,081.96**	**96,065.61**	**119,025.67**	**1,259,679.53**	**1,002,539.67**	**428,651,479.57**	**1,233,580,792.90**	**18,333,736.00**

Note: Data are from Section 8 of Form R

Table 3-37: TRI On-site and Off-site Releases, by Industry, 2001: Lead and Lead Compounds

			On-site Releases							Off-site Releases	Total
					Underground Injection		On-site Land Releases				
SIC Code	Industry	Total Forms	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	On- and Off-site Releases
		Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
10	Metal Mining	78	141,379 61	3,939 96	0 00	6,019,513 10	0 00	329,252,815 95	335,417,648 62	8,277 85	335,425,926 47
12	Coal Mining	62	106 23	26,081 10	0 00	7,150 90	0 00	1,202,021 57	1,235,359 80	10,773 30	1,246,133 10
20	Food	67	15,907 62	624 00	0 00	0 00	0 00	6,078 72	22,610 34	26,673 30	49,283 64
21	Tobacco	4	113 20	16 10	0 00	0 00	0 00	0 00	129 30	7,331 00	7,460 30
22	Textiles	32	3,950 22	13 22	0 00	0 00	0 00	2,350 57	6,314 01	26,433 69	32,747 70
23	Apparel	2	0 00	0 00	0 00	0 00	0 00	75 00	75 00	0 00	75 00
24	Lumber	372	26,547 46	198 20	0 00	0 00	0 01	38,504 29	65,249 96	17,723 66	82,973 61
25	Furniture	105	4,160 73	476 10	0 00	0 00	0 00	26 69	4,663 53	14,036 57	18,700 10
26	Paper	244	38,616 55	29,625 15	0 00	0 00	4 60	271,474 91	339,721 20	128,076 72	467,797 92
27	Printing	39	52 64	0 00	0 00	0 00	0 00	408 00	460 64	32,680 22	33,140 86
28	Chemicals	523	37,976 05	7,754 94	188,003 00	0 00	5,476 33	1,483,776 10	1,722,986 42	18,278,880 19	20,001,866 61
29	Petroleum	177	33,245 71	3,529 40	0 00	8 40	0 00	8,735 78	45,519 29	61,097 16	106,616 46
30	Plastics	306	15,627 62	253 03	0 00	0 00	7,394 00	7,441 61	30,716 26	131,503 75	162,220 01
32	Stone/Clay/Glass	586	164,210 75	476 59	0 00	6 65	400 70	659,454 41	824,549 10	1,329,351 03	2,153,900 12
33	Primary Metals	1,047	683,842 13	271,089 65	2,626 00	0 00	507,879 56	17,425,713 26	18,891,150 59	25,457,150 43	44,348,301 03
34	Fabricated Metals	957	27,045 92	2,143 94	0 00	0 00	54,853 00	36,980 43	121,023 29	494,118 57	615,141 86
35	Machinery	301	28,049 94	30 04	0 00	0 00	3 98	1,068 82	29,152 78	81,184 56	110,337 34
36	Electrical Equip	1,252	49,317 60	1,983 71	0 00	0 00	4,213 36	1,777 81	57,292 47	1,440,503 19	1,497,795 66
37	Transportation Equip	395	31,227 17	908 61	0 00	0 00	204 78	2,756 31	35,096 87	546,544 27	581,641 14
38	Measure/Photo	174	8,582 78	1,053 33	0 00	0 00	250 00	577 10	10,463 21	46,198 74	56,661 95
39	Miscellaneous	72	857 08	62 97	0 00	0 00	26 00	374 00	1,320 05	27,193 21	28,513 26
--	Multiple codes 20-39	520	44,853 83	11,529 08	0 00	0 01	649 45	271,667 66	328,700 04	653,796 71	982,496 75
--	No codes 20-39	231	55,698 90	1,690 65	0 00	0 00	3,883 60	2,034,968 72	2,096,241 87	291,617 92	2,387,859 79
491/493	Electric Utilities	557	208,763 62	49,553 07	0 00	4 28	50,348 40	7,408,031 13	7,716,700 51	1,595,902 83	9,312,603 34
5169	Chemical Wholesale Distributors	12	20 00	0 00	0 00	0 00	5 00	0 00	25 00	4,214 60	4,239 60
5171	Petroleum Terminals/Bulk Storage	275	402 68	46 88	0 00	0 00	0 00	491 00	940 56	5,358 82	6,299 38
7389/4953	Hazardous Waste/Solvent Recovery	171	12,565 60	340 10	15,509 00	0 00	17,974,606 38	692,105 55	18,695,126 63	4,575,848 63	23,270,975 26
	Total	**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**

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 metal mining industry reported the second largest amount of lead and lead compounds in production-related waste, with 335.6 million pounds or 27.2 percent of the total for lead and lead compounds in 2001. Over 99.0 percent of the lead and lead compounds in production-related waste reported by the metal mining industry (332.3 million pounds) was released on- and off-site.

The electrical equipment manufacturers reported the third largest amount of lead and lead compounds in production-related waste, with 278.0 million pounds. This industry reported the largest amount recycled off-site, with 190.9 million pounds. Off-site recycling by the electrical equipment industry accounted for 68.6 percent of that industry's lead and lead compounds in production-related waste.

Projected Quantities of TRI Chemicals Managed in Waste, 2001-2003

TRI facilities expected to decrease their quantities of lead and lead compounds in production-related waste between 2001 and 2003 by 14.9 percent, from 1.23 billion pounds to 1.05 million pounds (see Table 3-39). The decrease was projected to occur mainly in quantities released on- and off-site, which was expected to decline by 40.4 percent. The amount recycled on-site was expected to increase by 0.5 percent. 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).

From 2001 to 2002, a decrease of 11.9 percent was projected, followed by a decrease of 3.3 percent from 2002 to 2003. On- and off-site releases were

Table 3-38: Quantities of TRI Chemicals in Waste, by Industry, 2001: Lead and Lead Compounds

SIC Code	Industry	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On- and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-production-related Waste Managed Pounds
10	Metal Mining	2,404,329 90	736,901 30	0 00	98,000.00	0.00	1.90	332,319,753 87	335,558,986.97	444,869 28
12	Coal Mining	0 00	5 00	0 00	0 00	118 00	0 00	1,236,744 88	1,236,867 88	13,615 00
20	Food	0.00	1,440 90	0 00	0 00	313 00	0 00	54,905 17	56,659 07	983 00
21	Tobacco	0 00	0 00	0 00	0 00	0 00	0 00	7,464 30	7,464 30	0 00
22	Textiles	0 00	3,000.00	0 00	871 00	0 00	0 00	29,513 92	33,384 92	21.57
23	Apparel	0 00	0 00	0 00	0 00	0 00	0 00	75 00	75 00	0 00
24	Lumber	4,061 18	29,460 20	280.00	0 00	1,413 06	122 30	82,421 90	117,758 65	1,394 11
25	Furniture	0 00	27,298 58	1,153 61	117 28	5 00	77 29	33,050 19	61,701 95	197 00
26	Paper	79 20	10,576 38	0 00	0.00	4,461.10	2,792.33	470,299.70	488,208 71	1,521 90
27	Printing	405 00	169,151 46	0 00	1,884 00	0 00	90 13	40,905 48	212,436 07	0 00
28	Chemicals	463,193 11	2,360,384 35	60 00	4,732 40	28,991 06	32,346 79	5,576,401.40	8,466,109.12	9,360 92
29	Petroleum	28,368 99	21,192 97	0 00	168 00	561 00	12,835 79	120,931 74	184,058 49	16,209 01
30	Plastics	396,065 03	653,867 91	0 00	3,553 00	12,130 00	55,917 03	165,001 87	1,286,534.84	47 50
32	Stone/Clay/Glass	82,213,690 99	1,047,595 01	7,986 00	2 00	750 36	91,063 33	2,485,825 27	85,846,912 96	30,799 36
33	Primary Metals	367,579,294 97	28,656,413.15	0 00	0 00	1,184,280.70	528,799.49	44,406,985 06	442,355,773.37	17,496,672 60
34	Fabricated Metals	1,684,526 70	10,321,968 57	0 00	2,167 00	1,978 90	71,994 75	579,979 79	12,662,615 71	48,999 07
35	Machinery	284,005 00	2,716,116.31	0.00	2,601 00	2 00	577 00	113,624 53	3,116,925.84	3,466 89
36	Electrical Equip	82,104,587 21	190,852,924 02	0 00	2,396 00	2,375 28	51,841 62	5,012,913 83	278,027,037 97	71,608 70
37	Transportation Equip	2,973,324 90	3,547,916 95	0 00	50 00	7,889 71	3,349 30	399,111 15	6,931,642.01	7,027 37
38	Measure/Photo	88,117 00	413,288 60	0 00	0 00	0 00	6,761 20	62,957 99	571,124 79	1,118 39
39	Miscellaneous	5,641 00	83,851 46	0 00	0 00	121 50	1,479 03	20,602 82	111,695 82	20 22
--	Multiple codes 20-39	3,055,034 29	14,538,497 78	0 00	1,040 99	1,385 00	32,156 48	1,215,879 99	18,843,994 53	72,318 61
--	No codes 20-39	285,915 00	733,176.44	86,586 00	0.00	4,574 00	6,352.60	2,298,460 92	3,415,064 96	70,005 14
491/493	Electric Utilities	104,460 00	70,393 34	0 00	0 00	8 00	19,453 44	8,474,178 31	8,668,493 09	34,136 30
5169	Chemical Wholesale Distributors	0 00	3,893 00	0 00	0 00	0 00	0 00	4,847 62	8,740.62	0 00
5171	Petroleum Terminals/Bulk Storage	2 40	2,031 37	0 00	856 00	0 00	721 98	3,376 36	6,988 11	1,195 10
7389/4953	Hazardous Waste/Solvent Recovery	1,819 00	1,773,736 90	0 00	587 00	8,321.86	83,805 89	23,435,266 51	25,303,537.16	8,148 96
	Total	**543,676,920.88**	**258,775,081.96**	**96,065.61**	**119,025.67**	**1,259,679.53**	**1,002,539 67**	**428,651,479.57**	**1,233,580,792.90**	**18,333,736.00**

Note: Data are from Section 8 of Form R

Table 3-39: Current Year and Projected Quantities of TRI Chemicals in Waste, 2001-2003: Lead and Lead Compounds

Waste Management Activity	Current Year 2001 Total Pounds	Current Year 2001 Percent of Total	Projected 2002 Total Pounds	Projected 2002 Percent of Total	Projected 2003 Total Pounds	Projected 2003 Percent of Total
Recycled On-site	543,676,920.88	44.1	541,666,969.44	49.8	546,160,068.02	52.0
Recycled Off-site	258,775,081 96	21 0	252,493,370 99	23.2	246,258,917 95	23.4
Energy Recovery On-site	96,065.61	0.0	125,776.60	0 0	125,776.60	0.0
Energy Recovery Off-site	119,025 67	0 0	146,694 41	0 0	146,707 52	0 0
Treated On-site	1,259,679.53	0.1	1,380,087.43	0 1	1,380,070.17	0.1
Treated Off-site	1,002,539 67	0 1	768,525 23	0 1	739,679 95	0 1
Quantity Released On- and Off-site	428,651,479.57	34.7	290,029,510.17	26 7	255,524,312.44	24.3
Total Production-related Waste Managed	**1,233,580,792.90**	**100.0**	**1,086,610,934.28**	**100.0**	**1,050,335,532.66**	**100.0**
Waste Management Activity	**Projected Change 2001-2002** Percent		**Projected Change 2002-2003** Percent		**Projected Change 2001-2003** Percent	
Recycled On-site	-0.4		0.8		0.5	
Recycled Off-site	-2 4		-2 5		-4 8	
Energy Recovery On-site	30.9		0.0		30.9	
Energy Recovery Off-site	23 2		0 0		23 3	
Treated On-site	9 6		0.0		9 6	
Treated Off-site	-23 3		-3 8		-26 2	
Quantity Released On- and Off-site	-32.3		-11.9		-40.4	
Total Production-related Waste Managed	**-11.9**		**-3.3**		**-14.9**	

Note: Data from Section 8 of Form R for 2001

Table 3-40: Number of Forms Reporting Source Reduction Activity, by Category, 2001: Lead and Lead Compounds

CAS Number	Chemical	Total Form Rs Number	Forms Reporting Source Reduction Activity: Number	Forms Reporting Source Reduction Activity: Percent of All Form Rs Percent	Category of Source Reduction Activity: Good Operating Practices Number	Inventory Control Number	Spill and Leak Prevention Number	Raw Materials Modifications Number	Process Modifications Number	Cleaning and Degreasing Number	Surface Preparation and Finishing Number	Product Modifications Number
7439-92-1	Lead	4,201	561	13 4	190	38	45	90	110	18	24	46
--	Lead compounds	4,360	753	17 3	267	54	85	138	139	10	21	39
	Total	**8,561**	**1,314**	**15.3**	**457**	**92**	**130**	**228**	**249**	**28**	**45**	**85**

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

projected to decrease by 32.3 percent from 2001 to 2002 and by 11.9 percent from 2002 to 2003.

Source Reduction

In 2001, a total of 1,314 forms were filed reporting source reduction activities for lead and lead compounds (see Table 3-40). As noted in **Waste Management** in Chapter 1, source reduction—an activity that prevents the generation of waste—is preferred to waste management. These 1,314 forms represented 15.3 percent of all forms submitted for lead and lead compounds in 2001.

The most frequently reported source reduction activity was good operating practices (listed on 457 forms). Raw materials modifications came next, with 228 forms, followed by process modifications, with 249 forms, and spill and leak prevention, with 130 forms.

Box 3-3: TRI Data for Lead and Lead Compounds before 2001

Reporting for lead and lead compounds before 2001 was based on the higher TRI thresholds of 25,000 pounds for manufacture or processing of lead or lead compounds and 10,000 pounds for otherwise using lead or lead compounds. For the reporting year 2001, these thresholds were reduced to 100 pounds for manufacture, processing or otherwise using lead or lead compounds. Lowering the threshold to 100 pounds required the reporting of releases of lead or lead compounds by those facilities that did not exceed the previous 25,000 pound and 10,000 pound activity (reporting) thresholds, and did not have to file release reports for lead or lead compounds prior to reporting year 2001. In other words, as a result of the lower reporting threshold, more facilities are now required to report their annual releases and other waste management quantities of lead and lead compounds. While the number of facilities *reporting* releases increased in 2001, and the *reported* release quantities have increased in 2001, the *actual* environmental releases of lead and lead compounds may or may not have increased. Because of the change in the reporting threshold, the release and other waste management quantities reported for 2001 are not comparable with those for prior years, nor are the number of facilities reporting releases for lead and lead compounds.

Following is a brief summary of releases and transfers of lead and lead compounds and lead and lead compounds in production-related waste for 1998, 1999 and 2000.

TRI Data for Lead and Lead Compounds, 1998-2000

	1998	1999	2000	Change 1998-2000	
	Number	Number	Number	Number	Percent
Total Forms	2,017	1,936	2,025	8	0.4
	Pounds	**Pounds**	**Pounds**	**Pounds**	**Percent**
Total On-site Releases	280,170,459	299,698,108	349,880,462	69,710,003	24.9
Off-site Releases (Transfers to Disposal)	26,678,971	28,744,346	24,303,227	-2,375,744	-8.9
Total On- and Off-site Releases	**306,849,431**	**328,442,454**	**374,183,689**	**67,334,259**	**21.9**
Total Production-related Waste Managed	**1,339,127,062**	**1,276,910,365**	**1,305,445,715**	**-33,681,348**	**-2.5**

Lead and lead compounds have been on the TRI chemical list since the list was established in 1986. The following is a summary of releases and transfers for 1988-2000. This table includes only manufacturing industries for 1998 and 2000 since other industries were not required to report to TRI before 1998.

TRI Data for Lead and Lead Compounds, 1988-2000

	1988	1998	1999	2000	Change 1988-2000	
	Number	Number	Number	Number	Number	Percent
Total Forms	1,604	1,708	1,660	1,751	147	9.2
	Pounds	**Pounds**	**Pounds**	**Pounds**	**Pounds**	**Percent**
Total On-site Releases	29,612,313	21,146,970	18,865,189	14,867,850	-14,744,463	-49.8
Off-site Releases (Transfers to Disposal)	28,205,929	34,323,439	31,355,307	31,988,095	3,782,166	13.4
Total On- and Off-site Releases	**57,818,242**	**55,470,409**	**50,220,496**	**46,855,945**	**-10,962,297**	**-19.0**

Mercury and Mercury Compounds

INTRODUCTION

Mercury is a heavy, silver-white metal that exists as a liquid at ambient temperatures. It is a precious metal used in chlor-alkali production, wiring devices, switching mechanisms, amalgam dental fillings, and measurement and control instruments. Industries also manufacture and process mercury reagents, catalysts, and medicinal chemicals. Metal ores, coal, crude oil, and fuel oils contain mercury as a trace constituent.

Mercury combines with other elements, such as chlorine, sulfur, or oxygen, to form inorganic mercury compounds or "salts", which are usually white powders or crystals. Mercury also combines with carbon to make organic mercury compounds, the most common being methylmercury which is primarily produced by small organisms in the water and soil. Methylmercury has no industrial uses; it is formed in the environment from the methylation of the inorganic mercurial ion. Inorganic mercury compounds have been used in the past in laxatives, skin-lightening creams and soaps, and in latex paint. EPA has banned the use of mercury in paints and pesticides.

More details on mercury and mercury compounds, their sources, chemical characteristics, health and environmental effects and efforts being undertaken to reduce pollution from mercury and mercury compounds can be found in the *2000 Toxics Release Inventory Public Data Release Report* (EPA 260-R-02-003).

2001 TRI DATA FOR MERCURY AND MERCURY COMPOUNDS

On-site and Off-site Releases, 2001

As shown in Table 3-41, there were 1,665 TRI forms submitted for mercury and mercury compounds for 2001. On- and off-site releases of mercury and mercury compounds totaled 4.9 million pounds, with 4.8 million pounds of this reported as mercury compounds. Over 90 percent of total releases of mercury and mercury compounds were other on-site land releases (that is, other than RCRA subtitle C landfills), which totaled 4.5 million pounds (see Figure 3-7). (Types of on-site land releases are described in Box 1-4 in Chapter 1.) The second-largest release type was off-site releases (transfers to disposal), which totaled 228,283 pounds and accounted for 4.7 percent of total releases.

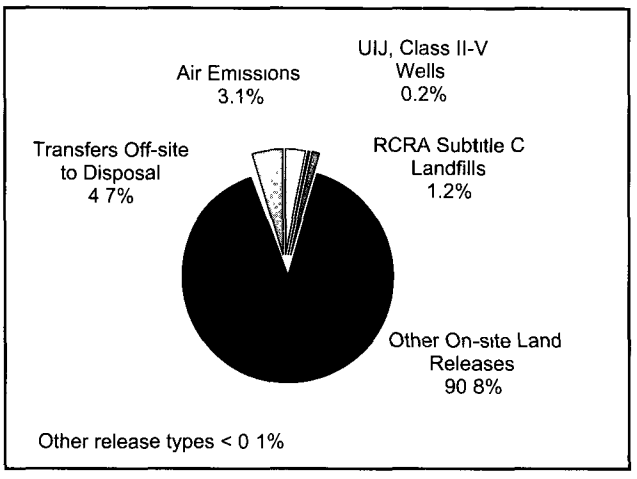
Smaller amounts of other types of releases were reported. Air emissions totaled 150,463 pounds or 3.8 percent of total releases of mercury and mercury compounds in 2001. On-site land releases to RCRA subtitle C landfills were 60,009 pounds and surface water discharges were 1,805 pounds. Underground injection of mercury and mercury compounds was 8,035 pounds to Class II-V wells and 1,741 pounds to Class I wells.

Table 3-41: TRI On-site and Off-site Releases, 2001: Mercury and Mercury Compounds

			On-site Releases							Off-site Releases	Total
					Underground Injection		On-site Land Releases				
CAS Number	Chemical	Total Forms	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	On- and Off-site Releases
		Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
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
	Total	**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**

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

Figure 3-7: Distribution of TRI On-site and Off-site Releases, 2001: Mercury and Mercury Compounds



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

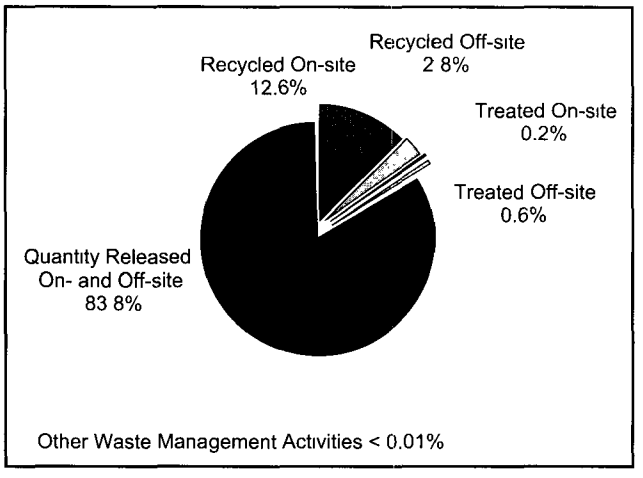
Waste Management Data, 2001

Quantities of TRI Chemicals in Waste

Mercury and mercury compounds in production-related waste totaled 5.8 million pounds in 2001, as shown in Table 3-42. Over 91 percent was reported as mercury compounds.

Almost 83.8 percent (4.9 million pounds) of the mercury and mercury compounds in production-related waste was released on- or off-site (see Figure 3-8). On-site recycling accounted for 12.6 percent, or 735,097 pounds and off-site recycling for 2.8 percent, or 161,542 pounds. Other types of waste management accounted for less than one percent of the total.

Figure 3-8: Distribution of Quantities of TRI Chemicals in Waste, 2001: Mercury and Mercury Compounds



Note: Data are from Section 8 of Form R

Transfers Off-site for Further Waste Management, including Disposal

Transfers off-site of mercury and mercury compounds for further waste management, including disposal, totaled 409,188 pounds in 2001 (see Table 3-43). Transfers of mercury compounds accounted for 61.1 percent of the total.

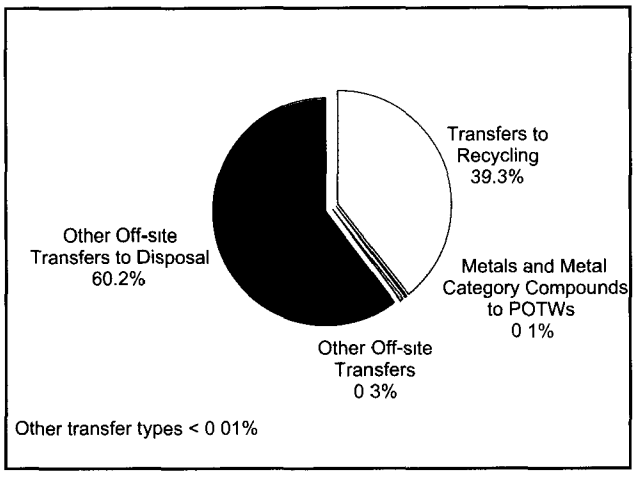
Of the total transfers off-site for further waste management, including disposal, the category other transfers off-site to disposal were 246,409 pounds or 60.2 percent of all transfers for further waste management, including disposal, and transfers to recycling were 160,905 pounds or 39.3 percent (see Figure 3-9). Transfers to treatment, transfers to POTWs of metals and metal category compounds and other off-site transfers totaled 1,875 pounds for 2001.

Table 3-42: Quantities of TRI Chemicals in Waste, 2001: Mercury and Mercury Compounds

CAS Number	Chemical	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On- and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-production-related Waste Managed Pounds
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
	Total	**735,096.83**	**161,542.34**	**77.00**	**1.80**	**10,862.96**	**37,796.80**	**4,873,159.63**	**5,818,537.36**	**16,014.15**

Note: Data are from Section 8 of Form R

Figure 3-9: Distribution of TRI Transfers Off-site for Further Waste Management, including Disposal, 2001: Mercury and Mercury Compounds



Note: Transfers Off-site for Further Waste Management, including Disposal are from Section 6 of Form R

TRI Data by State

Facilities in Pennsylvania and Texas, with 114 and 113 forms respectively, submitted the largest number of forms in 2001 for mercury and mercury compounds. California ranked third with 100 forms.

On- and Off-site Releases

In 2001, facilities in Nevada reported the largest total on- and off-site releases of mercury and mercury compounds (see Table 3-44). They reported a total of 4.2 million pounds, or 85.5 percent of the total for mercury and mercury compounds in 2001. This was almost 40 times the amount of releases from facilities in Alabama, which reported the second largest amount, 107,680 pounds or 2.2 percent.

Almost all of Nevada's releases of mercury and mercury compounds were as other on-site land releases (that is, other than RCRA subtitle C landfills). Such releases for Nevada were 4.2 million pounds or 93.7 percent of all such on-site land releases of mercury and mercury compounds in 2001.

Illinois facilities reported the largest amount of off-site releases (transfers to disposal) of any state, with 58,151 pounds or 25.5 percent of total off-site releases of mercury and mercury compounds in 2001. Texas facilities reported the largest air emissions, with 14,765 pounds or 9.8 percent of all air emissions of mercury and mercury compounds in 2001.

As shown in Map 3-3, releases of mercury and mercury compounds are dominated by Nevada, with the remaining releases spread over a number of states. Three states besides Nevada, Alabama, California and Illinois, each released more than 50,000 pounds, and an additional 14 states each released more than 10,000 pounds.

Waste Management Data

The state with the largest quantity of mercury and mercury compounds in production-related waste of mercury and mercury compounds in 2001 was

Table 3-43: TRI Transfers Off-site for Further Waste Management, including Disposal, 2001: Mercury and Mercury Compounds

CAS Number	Chemical	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs: Metals and Metal Category Compounds Pounds	Transfers to POTWs: Non-metal TRI Chemicals Pounds	Other Off-site Transfers* Pounds	Other Off-site Transfers to Disposal** Pounds	Total Transfers for Further Waste Management, including Disposal Pounds
7439-97-6	Mercury	74,756.08	0.00	13 00	103 71	0.00	1,392.00	82,958.66	159,223 45
--	Mercury compounds	86,148 48	0 00	0 40	365 89	0 00	0 00	163,449 91	249,964 67
	Total	**160,904.56**	**0.00**	**13.40**	**469.60**	**0.00**	**1,392.00**	**246,408.57**	**409,188.12**

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*

Nevada (see Table 3-45). Nevada's 4.5 million pounds of mercury and mercury compounds in production-related waste accounted for 76.8 percent of the total, almost 25 times that of any other state. Pennsylvania ranked second with 180,490 pounds and West Virginia ranked third with 135,613 pounds.

Nevada released on- and off-site 4.2 million pounds or 86.0 percent of all mercury and mercury compounds releases in 2001. Alabama reported the second largest quantity released on- and off-site, 108,152 pounds or 2.2 percent.

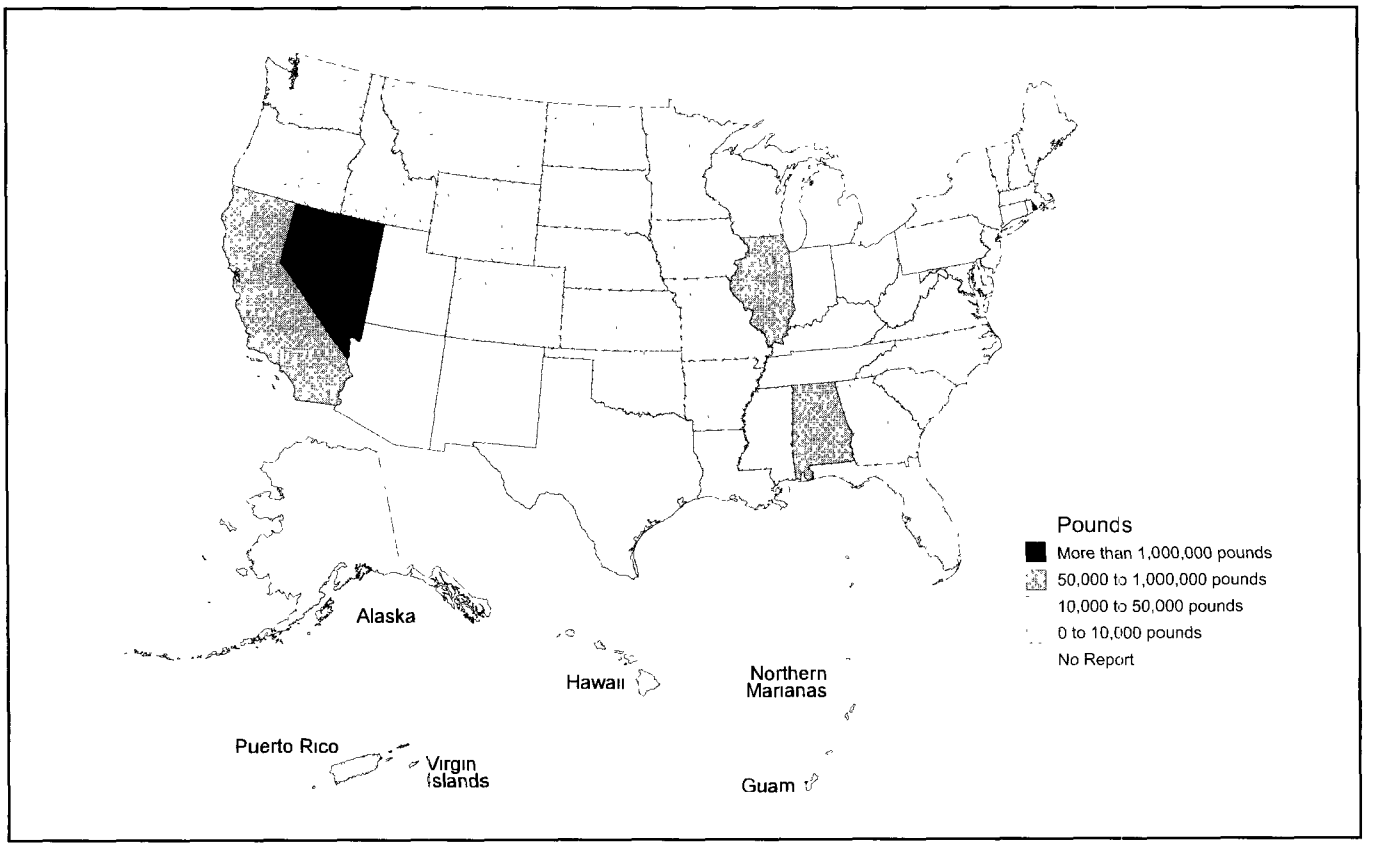
Nevada reported the largest amount of mercury and mercury compounds recycled on-site, 275,782 pounds or 37.5 percent of all on-site recycling. Pennsylvania, the second ranked state for mercury and mercury compounds in production-related waste, reported the second largest amount recycled on-site, with 139,012 pounds or 18.9 percent of all on-site recycling of mercury and mercury compounds in 2001.

TRI Data by Industry

On- and Off-site Releases

Metal mines reported the largest total releases of mercury and mercury compounds in 2001, with 4.32 million pounds or 88.1 percent of the total on- and off-site releases (see Table 3-46). Metal mines reported the largest other on-site land releases (that is, land releases other than RCRA subtitle C landfills), with 4.30 million pounds or 96.5 percent of all such releases. The hazardous waste/solvent recovery industries reported the second largest total releases. Their 164,837 pounds of releases account-

Map 3-3: Total On- and Off-site Releases, 2001: Mercury and Mercury Compounds



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

Table 3-44: TRI On-site and Off-site Releases, by State, 2001: Mercury and Mercury Compounds

		On-site Releases							Off-site Releases	
				Underground Injection		On-site Land Releases				
State	Total Forms	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
Alabama	48	5,903 26	52 69	0 00	12.00	16,400.00	84,924 18	107,292.13	387.79	107,679.92
Alaska	9	234 24	0 12	0 00	7,867 00	0 00	9,670 00	17,771.36	5 60	17,776 96
Arizona	20	1,573.42	0.00	0.00	0 00	0.00	29,029.96	30,603.39	428.55	31,031.93
Arkansas	19	1,632 15	7 47	0 00	0 00	0.00	88 84	1,728 46	340 66	2,069 12
California	100	5,667.94	10.10	0.00	0 61	14,250.80	34,753.92	54,683 36	36,664.30	91,347.66
Colorado	28	820 50	1 87	0 00	0 00	199 70	1,710 62	2,732 69	683 70	3,416 39
Connecticut	12	122.88	0 41	0.00	0.00	0.00	0.00	123 29	19,419.88	19,543 17
Delaware	9	1,482 01	20 30	0 00	0 00	0.00	215 30	1,717 61	48 97	1,766 58
Florida	53	2,538.38	12.23	0.00	0.00	431.00	2,218 19	5,199.80	280 17	5,479.97
Georgia	32	3,692 51	14 43	0 00	0 00	0 00	911 41	4,618 34	98 02	4,716 36
Hawaii	6	114.37	3 60	0.00	2 30	0.00	0.00	120.27	28 90	149.17
Idaho	6	643 74	0 00	0 00	0 00	430 00	3,815 79	4,889 53	0 00	4,889.53
Illinois	68	5,974.22	15.97	0.00	0.00	263.00	1,605.52	7,858 71	58,151.16	66,009.86
Indiana	64	7,167 75	126 25	0 40	0.00	0 00	3,000 40	10,294 80	1,193 70	11,488 50
Iowa	45	2,712 97	6 13	0 00	0 00	0.00	125 61	2,844.71	479.83	3,324.54
Kansas	23	2,117 44	0 70	0 00	0 00	0 00	298 50	2,416 64	256 17	2,672 81
Kentucky	48	5,255.87	92 02	0.00	0.00	0.00	3,857 20	9,205.09	24,260.30	33,465 40
Louisiana	48	4,467 19	85 77	1 41	0 00	800 00	1,981 18	7,335 56	4,502 21	11,837 76
Maine	6	92.50	1 28	0 00	0.00	0.00	0 00	93 78	23 50	117.28
Maryland	21	2,221 64	2 72	0 00	134 03	0 00	443 02	2,801 41	707 70	3,509 11
Massachusetts	19	236.23	0.00	0.00	0 00	0.00	4.20	240.43	275.28	515.70
Michigan	52	3,995 64	21.81	0 00	0 00	13,491 00	1,077 74	18,586 19	7,236 62	25,822.82
Minnesota	29	1,835.32	1.64	0 00	0.00	0.00	962.96	2,799 92	391.77	3,191.69
Mississippi	19	632 80	135 26	1,052 90	0 00	115 00	5,284 44	7,220 40	219 31	7,439.71
Missouri	36	3,572.45	3.15	0.00	0.00	2.93	701.75	4,280.28	3,079.42	7,359.69
Montana	16	1,842 20	2 44	0 00	18 00	0 00	7,590 30	9,452 94	380 21	9,833 15
Nebraska	13	551.68	0.01	0 00	0.00	0.00	949.00	1,500 69	350.91	1,851.59
Nevada	30	12,959 27	1 00	0 00	0 10	2,545 00	4,177,021 90	4,192,527 27	1,215 76	4,193,743 03
New Hampshire	6	29.00	0.00	0.00	0.00	0.00	5.70	34.70	53.81	88.51
New Jersey	26	758 47	12 60	0 00	1 00	37 00	0 50	809 57	740 10	1,549 67
New Mexico	10	1,554 04	0.00	0.00	0 00	0 00	12,507.06	14,061 10	361.85	14,422.95
New York	38	1,358 05	17 05	0 00	0 00	0 00	566 45	1,941 55	1,080 39	3,021 94
North Carolina	38	4,163.58	18.89	0.00	0 00	0 00	2,137 85	6,320.33	496.32	6,816.65
North Dakota	10	2,306 12	0 40	0 00	0 00	0 00	278 00	2,584 52	354 72	2,939 24
Ohio	98	11,404.56	567 38	150 00	0 00	59 48	4,283.40	16,464.82	3,601.83	20,066.65
Oklahoma	20	1,513 99	8 91	0 00	0 00	3,360 00	171 11	5,054 01	629 61	5,683 62
Oregon	18	486.99	3 51	0.00	0 00	3,957.23	77.98	4,525.70	24.06	4,549.76
Pennsylvania	114	9,088 94	67 30	0 00	0 00	0 30	5,554 69	14,711 23	17,562 43	32,273 67
Puerto Rico	14	418.04	22.80	0 00	0 00	0 00	0.00	440 84	1.80	442.64
Rhode Island	6	0 10	0 00	0 00	0 00	0.00	0 00	0 10	3 35	3 45
South Carolina	37	2,262.54	99 17	0.00	0 00	0.00	1,411.87	3,773.57	1,536.68	5,310.26
South Dakota	6	229 42	0 02	0 00	0 00	0 00	46 60	276 04	0 00	276 04
Tennessee	39	4,061.83	108.97	0 00	0 00	993 00	1,779 73	6,943.53	17,819.24	24,762.77
Texas	113	14,765 36	50 57	536 40	0 00	71 10	6,185 42	21,608 85	3,482 73	25,091 58
Utah	21	1,002 02	5.00	0.00	0 00	2,584.00	41,603.46	45,194.48	790.92	45,985 40
Vermont	1	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
Virgin Islands	3	176.00	0.00	0.00	0 00	0.00	50.00	226.00	138.00	364 00
Virginia	43	2,917 56	22 10	0 00	0 00	0 00	707 70	3,647 36	1,236 91	4,884 27
Washington	24	519 72	10.08	0.00	0 00	0.00	359 06	888.86	382.08	1,270.94
West Virginia	37	6,281 59	165 01	0 00	0 00	5 00	5,177 13	11,628 73	15,765 36	27,394 09
Wisconsin	45	3,403.11	5 92	0.00	0.00	13.30	211.99	3,634.32	1,048.55	4,682.87
Wyoming	19	1,701 25	0 10	0 00	0 00	0 00	623 15	2,324 50	61 82	2,386 32
Total	**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**

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

Table 3-45: Quantities of TRI Chemicals in Waste, by State, 2001: Mercury and Mercury Compounds

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	16,321.97	55 50	0 00	0 00	16 00	2.10	108,152.12	124,547.69	0 00
Alaska	3 10	0 00	0 00	0 00	0 00	0 00	18,248 57	18,251 67	1 00
Arizona	5,474.00	1,244.45	0 00	0.00	0.00	0.00	31,114.56	37,833 00	0 90
Arkansas	0 75	6,180 65	0 00	0 00	0 00	10 00	2,418 96	8,610 36	0 04
California	185 55	5,366.23	0 00	0 00	12 70	33,248.00	60,570.33	99,382.81	26 41
Colorado	5 20	39.00	0 00	0 00	0 00	0 00	3,487 71	3,531 91	0 00
Connecticut	0 50	21,644.08	0 00	0.00	0.00	0.00	20,013 80	41,658 38	1.93
Delaware	7,800 00	3,536.22	0 00	0 00	0 00	0 00	2,722 10	14,058 32	118.00
Florida	0.00	735.50	0 00	0.00	0.00	0.00	4,912.86	5,648.37	9.00
Georgia	6 60	1,975 29	0 00	0 00	0 00	7 89	4,726 93	6,716 71	0 00
Hawaii	0.00	0.00	0.00	0.00	0.00	0 00	190 70	190.70	0.00
Idaho	0 00	0 00	0 00	0.00	0 00	0 00	4,864 00	4,864 00	25 42
Illinois	30.22	13,301.88	0 00	0.00	0.00	0.00	69,269.76	82,601 86	0 98
Indiana	4,586 00	2,429 65	0 00	0 00	0 00	3 00	11,691 99	18,710 64	0 00
Iowa	0.00	160.03	0.00	0 00	11 00	11.00	3,343 81	3,525 84	0.00
Kansas	0 00	290.90	0 00	0 00	0 00	0 00	2,860 38	3,151 28	13 00
Kentucky	14,700 00	6,958.00	0.00	0.00	0.00	98 90	34,255.83	56,012 73	0 00
Louisiana	47,730 66	3,997 29	0 00	0 00	641 87	0 00	13,186 42	65,556 24	0 00
Maine	0.00	17.20	0 00	0.00	0.20	0.00	123.10	140 50	0.00
Maryland	1 58	32 90	0 00	0 00	0 00	2 70	3,385 31	3,422 49	0 00
Massachusetts	0 00	487.00	0 00	0.00	0.00	23.40	536 81	1,047.21	0 00
Michigan	118 00	8,231 56	0 00	0 00	0 00	108 00	25,572.50	34,030 06	61 00
Minnesota	9.42	663.74	0.00	0.00	0 00	0.00	3,154.02	3,827 18	40.00
Mississippi	48 80	212 21	0 00	0 00	0 00	0 00	7,509 39	7,770 40	0 00
Missouri	108.00	413 06	0.00	0 00	0 00	0.00	7,159.12	7,680.18	227.20
Montana	27,529 00	29 09	0 00	0 00	0 00	11 41	3,451 17	31,020 67	6,424 00
Nebraska	0.00	26.00	0.00	0 00	0 00	255.00	1,640.44	1,921.44	0.00
Nevada	275,782 40	1,469 31	0 00	0 00	0 00	1,202 50	4,192,488 88	4,470,943 09	0 00
New Hampshire	0.00	39 00	0.00	0 00	0.00	13 63	88 80	141.43	0 01
New Jersey	0 00	7,363 93	0 00	1 80	0 00	114 30	1,534 63	9,014 66	1,716 60
New Mexico	0.00	4 70	0.00	0.00	0 00	1.84	14,944 81	14,951.35	363 00
New York	0 00	321 20	0 00	0 00	0 00	0 00	2,868 45	3,189 65	69 00
North Carolina	0 00	137 80	0.00	0 00	0.00	62 84	6,862.27	7,062.91	4.20
North Dakota	0 00	0 00	0 00	0 00	0 00	0 00	2,939 50	2,939 50	0 00
Ohio	9,548 00	11,245 75	0.00	0 00	0.00	0.50	21,444 07	42,238.32	91.00
Oklahoma	0 00	6 00	0 00	0 00	0 00	11 34	5,643 56	5,660 90	0 00
Oregon	9.65	65.00	0 00	0.00	0 00	0.00	4,682.70	4,757.35	0.00
Pennsylvania	139,012 00	9,075 08	0 00	0 00	0 00	44 44	32,358 54	180,490 06	20 24
Puerto Rico	0.00	1,392.26	0.00	0 00	0.00	0.00	442.64	1,834.90	0.00
Rhode Island	0 00	0 00	0 00	0 00	0 00	0 00	3 45	3 45	0 00
South Carolina	613.51	195.80	0 00	0 00	0 00	0 00	5,546 82	6,356 13	0.00
South Dakota	0 00	5 00	0 00	0 00	0 00	0 00	278 30	283 30	0 00
Tennessee	20,085.00	262 10	0 00	0.00	0 00	93.00	24,021 94	44,462.04	0.00
Texas	16,604 57	6,476 36	77 00	0 00	9,413 01	2,338 31	24,334 12	59,243 36	1,093 97
Utah	2.60	0 00	0.00	0.00	767.18	0 00	40,292.33	41,062 12	5,700.40
Vermont	0 00	3,500 00	0 00	0 00	0 00	0 00	0 00	3,500 00	0 00
Virgin Islands	0 00	0 00	0 00	0.00	0.00	0.00	366.00	366 00	0 00
Virginia	0 00	219 51	0 00	0 00	0 00	0 00	5,455 80	5,675 31	1 86
Washington	0 00	19,476 60	0.00	0.00	0 00	0.00	1,448 70	20,925 30	5 00
West Virginia	105,510 00	575 91	0 00	0 00	1.00	39 00	29,486 75	135,612 66	0 00
Wisconsin	43,269 75	21,668.60	0 00	0 00	0.00	93 70	4,679.46	69,711.51	0.00
Wyoming	0 00	15 00	0 00	0 00	0 01	0 00	2,384 42	2,399 43	0.00
Total	**735,096.83**	**161,542.34**	**77.00**	**1.80**	**10,862.96**	**37,796.80**	**4,873,159.63**	**5,818,537.36**	**16,014.15**

Note: Data are from Section 8 of Form R

Table 3-46: TRI On-site and Off-site Releases, by Industry, 2001: Mercury and Mercury Compounds

			On-site Releases							Off-site Releases	Total
					Underground Injection		On-site Land Releases				
SIC Code	Industry	Total Forms	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	On- and Off-site Releases
		Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
10	Metal Mining	56	12,938 05	7 52	0 00	7,885 10	0 00	4,298,872 87	4,319,703 55	1,463 50	4,321,167 05
12	Coal Mining	54	7 83	175 73	0 00	146 03	0 00	6,284 35	6,613 94	56 70	6,670 64
20	Food	26	393 51	0 00	0 00	0 00	0.00	45.65	439 16	141.23	580 39
21	Tobacco	4	147 30	2 00	0 00	0 00	0 00	0 00	149 30	130 50	279 80
22	Textiles	1	15 00	0 00	0 00	0 00	0.00	0 00	15 00	0 00	15 00
24	Lumber	3	4 23	0 00	0 00	0 00	0 00	0 00	4 23	0 00	4 23
26	Paper	104	2,277 44	574 91	0 00	0 00	4 48	873 07	3,729 91	340 28	4,070 19
27	Printing	1	0 05	0 00	0 00	0 00	0 00	0 00	0 05	0 00	0 05
28	Chemicals	185	16,555 21	348 42	1,056 71	1 00	1,131 00	13,330.56	32,422 90	44,739.03	77,161 93
29	Petroleum	118	1,965 14	97 64	76 00	2 71	0 00	148 34	2,289 83	1,453 11	3,742 94
30	Plastics	10	15 84	0 00	0 00	0 00	0 00	0 00	15 84	48.67	64 51
32	Stone/Clay/Glass	181	12,848 08	3 16	0 00	0 00	0 00	84,851 87	97,703 11	146 31	97,849 43
33	Primary Metals	140	8,639 61	127 24	0 40	0 00	53 40	14,260 49	23,081 14	15,092 42	38,173 56
34	Fabricated Metals	7	12 75	0 00	0 00	0 00	0 00	0 00	12 75	70 00	82 75
35	Machinery	3	0 00	0 00	0 00	0 00	0 00	0 00	0.00	100 00	100.00
36	Electrical Equip	40	369 51	0 53	0 00	0 00	0 00	0 52	370 56	4,781 84	5,152 39
37	Transportation Equip	10	25 10	0.00	0 00	0 00	0 00	0 00	25 10	16 80	41 90
38	Measure/Photo	13	109 10	4 00	0 00	0 00	2 93	0 05	116 07	27 20	143 27
39	Miscellaneous	6	0 06	0 00	0 00	0 00	0 00	16 00	16 06	63 93	79 99
--	Multiple codes 20-39	51	1,453 05	38 52	0 00	0 00	0 30	261 75	1,753 62	1,631 03	3,384 65
--	No codes 20-39	13	370 25	0 12	0 00	0 00	0 00	2 70	373 07	33,850 58	34,223 65
491/493	Electric Utilities	506	91,143 54	418 21	0 00	0 20	547 00	36,918 92	129,027 88	19,366 39	148,394 27
5169	Chemical Wholesale Distributors	4	0 00	0 00	0 00	0 00	0 00	0 00	0 00	95 55	95 55
5171	Petroleum Terminals/Bulk Storage	67	0 89	0 10	0 00	0 00	0 00	0 00	0 99	0 11	1 10
7389/4953	Hazardous Waste/Solvent Recovery	62	1,171 30	7 04	608 00	0 00	58,269 73	113 64	60,169 71	104,667 77	164,837 47
	Total	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

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

ed for 3.4 percent of total releases of mercury and mercury compounds in 2001. The hazardous waste/solvent recovery industries also reported the largest off-site releases (transfers to disposal) of mercury and mercury compounds, with 104,668 pounds or 45.9 percent of all off-site releases.

Electric utilities reported the third largest total releases, with 148,394 pounds or 3.0 percent of the total releases of mercury and mercury compounds in 2001. They reported the largest air emissions of any industry sector, with 91,144 pounds or 60.6 percent of all air emissions of mercury and mercury compounds.

Waste Management

The metal mining industry reported the largest amount of mercury and mercury compounds in production-related waste in 2001 (see Table 3-47). With 4.6 million pounds of mercury and mercury compounds in production-related waste, it accounted for 79.0 percent of the total. Over 93.9 percent (4.3 million pounds) of mercury and mercury compounds in production-related waste reported by the metal mining industry was released on- and off-site. The metal mining industry also reported the largest amount recycled on-site (275,971 pounds, or 37.5 percent of the total amount recycled on-site).

The chemical industry reported the second largest amount of mercury and mercury compounds in production-related waste, with 357,537 pounds or 6.1 percent of the total for mercury and mercury compounds in 2001. Almost 70.9 percent of the mercury and mercury compounds in production-related waste reported by the chemical industry (253,431 pounds) was recycled on-site.

Projected Quantities of TRI Chemicals Managed in Waste, 2001-2003

TRI facilities expected to decrease their production-related waste of mercury and mercury compounds between 2001 and 2003 by 5.4 percent, from 5.8

Table 3-47: Quantities of TRI Chemicals in Waste, by Industry, 2001: Mercury and Mercury Compounds

SIC Code	Industry	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On- and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-production-related Waste Managed Pounds
10	Metal Mining	275,970.60	1,470 61	0 00	0.00	0.00	1,200 00	4,320,214.42	4,598,855.63	0.90
12	Coal Mining	0 00	0 00	0 00	0 00	1 00	0 00	6,594 33	6,595 33	363 00
20	Food	0 00	0.00	0 00	0 00	0.00	28.00	571.40	599 40	0.00
21	Tobacco	0 00	0 00	0 00	0 00	0 00	0 00	279 80	279 80	0 00
22	Textiles	0.00	0 00	0 00	0 00	0 00	0 00	176 00	176 00	0.00
24	Lumber	0 00	0 01	0 00	0 00	0 00	0 00	4 23	4 24	0 00
26	Paper	0.11	337.11	0.00	0 00	45.20	8.96	3,951 29	4,342.67	1 20
27	Printing	0 00	0 00	0 00	0 00	0 00	0 00	0 05	0 05	0 00
28	Chemicals	253,431 01	20,430 85	0 00	0.00	632.58	2,484.30	80,558.27	357,537.01	1,310 14
29	Petroleum	26 04	2,101 82	0 00	1 80	9,404 01	73 69	5,091 97	16,699 32	14 27
30	Plastics	0.50	0 00	0 00	0 00	0.00	0.00	65 10	65 60	0.10
32	Stone/Clay/Glass	3,657.74	228 93	77 00	0 00	0 00	0 00	97,718 13	101,681 80	124 38
33	Primary Metals	67,764.46	12,640 05	0 00	0 00	0 00	98 04	26,441 22	106,943 76	12,183.10
34	Fabricated Metals	0.00	59 00	0 00	0 00	0 00	65 00	17 75	141 75	0 00
35	Machinery	0.00	160 00	0 00	0 00	0 00	0.00	100.00	260.00	0.00
36	Electrical Equip	0 00	14,459 69	0 00	0 00	0 00	2 79	5,560 94	20,023 42	1,645 02
37	Transportation Equip.	0.00	516 50	0 00	0 00	0.00	3.90	35.90	556.30	6.20
38	Measure/Photo	0.00	10,313 15	0 00	0 00	0 00	19 50	139 12	10,471 77	0 00
39	Miscellaneous	0.00	21 00	0 00	0 00	0 00	0 00	63.99	84.99	0.00
--	Multiple codes 20-39	120,000 00	1,150 56	0 00	0 00	0 00	24 97	4,059 27	125,234 80	61 00
--	No codes 20-39	0.00	0 00	0 00	0 00	0.00	33,302.75	1,111.83	34,414.58	0.00
491/493	Electric Utilities	226.00	4,446 19	0 00	0 00	0 00	0 00	149,323 31	153,995 51	304 71
5169	Chemical Wholesale Distributors	0.00	32 80	0 00	0 00	0 00	0 00	133 00	165 80	0 00
5171	Petroleum Terminals/Bulk Storage	0 00	94 19	0 00	0 00	0 00	0 00	1 29	95 48	0 11
7389/4953	Hazardous Waste/Solvent Recovery	14,020.37	93,079 88	0 00	0 00	780.18	484.90	170,947.03	279,312.36	0.04
	Total	**735,096.83**	**161,542.34**	**77.00**	**1.80**	**10,862.96**	**37,796.80**	**4,873,159 63**	**5,818,537.36**	**16,014.15**

Note: Data are from Section 8 of Form R

million pounds to 5.5 million pounds (see Table 3-48). The decrease was projected to occur within most types of waste management. The quantity released on- and off-site, the largest type of waste management activity, was expected to decline by 3.8 percent. 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).

From 2001 to 2002, a decrease of 5.4 percent was projected, with no change projected from 2002 to 2003. The actual change from the prior year of 2000

Table 3-48: Prior Year, Current Year and Projected Quantities of TRI Chemicals in Waste, 2000-2003: Mercury and Mercury Compounds

Waste Management Activity	Prior Year 2000 Total Pounds	Prior Year 2000 Percent of Total	Current Year 2001 Total Pounds	Current Year 2001 Percent of Total	Projected 2002 Total Pounds	Projected 2002 Percent of Total	Projected 2003 Total Pounds	Projected 2003 Percent of Total
Recycled On-site	598,106 06	12.8	735,096.83	12 6	659,130.82	12 0	667,523.62	12.1
Recycled Off-site	125,891 13	2 7	161,542 34	2 8	139,373 36	2 5	136,081 52	2 5
Energy Recovery On-site	56.00	0 0	77 00	0 0	77 00	0 0	77.00	0 0
Energy Recovery Off-site	24.91	0.0	1 80	0 0	10 00	0 0	10 00	0 0
Treated On-site	23,647 86	0 5	10,862 96	0 2	10,255.41	0.2	10,253.41	0.2
Treated Off-site	1,026 20	0 0	37,796 80	0 6	2,014 23	0 0	2,014 73	0 0
Quantity Released On- and Off-site	3,927,400 01	84 0	4,873,159 63	83.8	4,695,069.12	85.3	4,690,287.62	85 2
Total Production-related Waste Managed	**4,676,152.17**	**100.0**	**5,818,537.36**	**100.0**	**5,505,929.94**	**100.0**	**5,506,247.90**	**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	22.9	-10.3	1.3	-9 2
Recycled Off-site	28 3	-13 7	-2 4	-15 8
Energy Recovery On-site	37 5	0 0	0.0	0 0
Energy Recovery Off-site	-92 8	455 6	0 0	455 6
Treated On-site	-54 1	-5.6	0 0	-5 6
Treated Off-site	3,583 2	-94 7	0 0	-94 7
Quantity Released On- and Off-site	24 1	-3 7	-0.1	-3 8
Total Production-related Waste Managed	**24.4**	**-5.4**	**0.0**	**-5.4**

Note: Data from Section 8 of Form R for 2001

Table 3-49: Number of Forms Reporting Source Reduction Activity, by Category, 2001: Mercury and Mercury Compounds

CAS Number	Chemical	Total Form Rs	Forms Reporting Source Reduction Activity		Category of Source Reduction Activity							
				Percent of All Form Rs	Good Operating Practices	Inventory Control	Spill and Leak Prevention	Raw Materials Modifications	Process Modifications	Cleaning and Degreasing	Surface Preparation and Finishing	Product Modifications
		Number	Number	Percent	Number	Number	Number	Number	Number	Number	Number	Number
7439-97-6	Mercury	537	65	12 1	16	1	17	5	24	0	0	2
--	Mercury compounds	1,128	77	6 8	30	10	8	8	20	0	0	1
	Total	**1,665**	**142**	**8.5**	**46**	**11**	**25**	**13**	**44**	**0**	**0**	**3**

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

to 2001 was an increase of 24.4 percent, from 4.7 million pounds to 5.8 million pounds.

Source Reduction

In 2001, 142 forms were filed reporting source reduction activities for mercury and mercury compounds (see Table 3-49). As noted in **Waste Management** in Chapter 1, source reduction—an activity that prevents the generation of waste—is preferred to waste management. These 142 forms represented 8.5 percent of all forms submitted for mercury and mercury compounds in 2001.

The most frequently reported source reduction activity was good operating practices (listed on 46 forms). Process modifications came next, with 44 forms, followed by spill and leak prevention, with 25 forms.

On- and Off-site Releases, 2000-2001

On- and off-site releases of mercury and mercury compounds increased from 4.3 million pounds to 4.9 million pounds from 2000 to 2001, an increase of 13.7 percent (see Table 3-50). On-site releases increased by 35.2 percent, or 1.2 million pounds. This was due to an increase in other on-site landfills releases (that is, other than RCRA subtitle C landfills), which increased by 1.3 million pounds or 39.1 percent. All other types of on-site releases of mercury and mercury compounds decreased from 2000 to 2001. On-site releases to RCRA subtitle C landfills decreased by 21,998 pounds or 26.8 percent. On-site air releases decreased by 11,180 pounds or 6.9 percent, surface water discharges decreased by 622 pounds or 25.6 percent and underground injection decreased by 1,937 pounds or 16.5 percent.

Off-site releases (transfers to disposal) of mercury and mercury compounds also decreased from 2000 to 2001, by 73.3 percent, or 626,185 pounds. This was primarily due to decreases in mercury and mercury compounds being sent for solidification/stabilization and sent to landfills/surface impoundments. Transfers for solidification/stabilization decreased by 347,076 pounds or 83.6 percent. Transfers to landfills/surface impoundments decreased by 285,043 pounds or 74.9 percent.

Waste Management Data, 2000-2001

Quantities of TRI Chemicals in Waste, 2000-2001

Mercury and mercury compounds in production-related waste increased from 4.9 million pounds in 2000 to 5.8 million pounds in 2001, an increase of 17.7 percent (see Table 3-51). The quantity released on- and off-site increased by 833,228 pounds or 20.6 percent. The amount treated off-site increased by 34,181 pounds and the amount recycled on-site increased by 25,290 pounds.

Decreases were reported in the amount of mercury and mercury compounds in production-related waste treated on-site, a decrease of 13,098 pounds or 54.7 percent. The amount of mercury and mercury compounds in waste recycled off-site also decreased, by 6,139 pounds or 3.7 percent.

Table 3-50: TRI On-site and Off-site Releases, 2000-2001: Mercury and Mercury Compound

	2000	2001	Change 2000-2001	
	Number	Number	Number	Percent
Forms	1,627	1,665	38	2.3
On-site Releases	**Pounds**	**Pounds**	**Pounds**	**Percent**
Total Air Emissions	161,643.04	150,462 84	-11,180.20	-6.9
Surface Water Discharges	2,427 37	1,805 15	-622 22	-25.6
Underground Injection	11,713.52	9,776.15	-1,937.37	-16.5
Class I Wells	1,931 72	1,741 11	-190 61	-9 9
Class II-V Wells	9,781.80	8,035.04	-1,746.76	-17 9
On-site Land Releases	3,285,051 41	4,515,989 61	1,230,938 20	37 5
RCRA Subtitle C Landfills	82,007.27	60,008.84	-21,998.44	-26.8
Other On-site Land Releases	3,203,044.14	4,455,980 78	1,252,936 63	39 1
Total On-site Releases	**3,460,835.34**	**4,678,033.75**	**1,217,198.42**	**35.2**
Off-site Releases				
Storage Only*	10,196 55	7,447.94	-2,748.61	-27.0
Solidification/Stabilization** Metals and Metal Category Compounds Only	415,330 48	68,254 65	-347,075 83	-83 6
Wastewater Treatment (Excluding POTWs)*** Metals and Metal Category Compounds Only	6,850 32	2,679 38	-4,170 94	-60 9
Transfers to POTWs**** Metals and Metal Category Compounds Only	413 09	469 60	56 51	13.7
Underground Injection	0.00	118 13	118 13	--
Landfills/Surface Impoundments	380,563.81	95,521 11	-285,042.70	-74.9
Land Treatment	516.03	717 37	201.34	39 0
Other Land Disposal	1,966.63	2,061.28	94.65	4.8
Other Off-site Management	6,919 27	9,147.05	2,227 77	32.2
Transfers to Waste Broker for Disposal	17,753.21	24,965.38	7,212.17	40.6
Unknown*****	13,958 38	16,901 06	2,942 68	21.1
Total Off-site Releases (Transfers Off-site to Disposal)	**854,467.77**	**228,282.95**	**-626,184.82**	**-73.3**
Total On- and Off-site Releases	**4,315,303.11**	**4,906,316.70**	**591,013.59**	**13.7**

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 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)

Table 3-51: Quantities of TRI Chemicals in Waste by Waste Management Activity, 2000-2001: Mercury and Mercury Compounds

Waste Management Activity	2000	2001	Change 2000-2001	
	Pounds	Pounds	Pounds	Percent
Recycled On-site	709,807.11	735,096.83	25,289.72	3.6
Recycled Off-site	167,681.83	161,542 34	-6,139.48	-3 7
Energy Recovery On-site	77.73	77.00	-0.73	-0.9
Energy Recovery Off-site	71.01	1.80	-69.21	-97 5
Treated On-site	23,960.88	10,862.96	-13,097.92	-54.7
Treated Off-site	3,615 53	37,796 80	34,181 27	945.4
Quantity Released On- and Off-site	4,039,931.39	4,873,159 63	833,228.24	20.6
Total Production-related Waste Managed	**4,945,145.47**	**5,818,537.36**	**873,391.89**	**17.7**
Non-production-related Waste Managed	18,143.88	16,014.15	-2,129.72	-11.7

Note: Data are from Section 8 of Form R of year indicated

Table 3-52: TRI Transfers Off-site for Further Waste Management, including Disposal, 2000-2001: Mercury and Mercury Compounds

	2000	2001	Change 2000-2001	
	Pounds	Pounds	Pounds	Percent
Transfers to Recycling	166,536.05	160,904.56	-5,631.49	-3.4
Transfers to Energy Recovery	1.00	0.00	-1 00	-100.0
Transfers to Treatment	58.00	13.40	-44.60	-76.9
Transfers to POTWs	413.09	469.60	56.51	13 7
Metals and Metal Category Compounds Only	413.09	469.60	56.51	13.7
Non-metal TRI Chemicals	0.00	0 00	0.00	--
Other Off-site Transfers*	0.00	1,392.00	1,392.00	--
Other Off-site Transfers to Disposal**	897,709.71	246,408 57	-651,301 14	-72.6
Total Transfers for Further Waste Management, including Disposal	**1,064,717.85**	**409,188.12**	**-655,529.73**	**-61.6**

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.

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

As shown in Table 3-52, transfers off-site for further waste management, including disposal, of mercury and mercury compounds decreased from 2000 to 2001, by 655,530 pounds or 61.6 percent. Other off-site transfers to disposal decreased by 651,301 pounds or 72.6 percent. Mercury and mercury compounds in waste sent for recycling also decreased, by 5,631 pounds or 3.4 percent.

Other types of transfers showed increases. Transfers to POTWs of mercury and mercury compounds increased from 2000 to 2001, by 57 pounds or 13.7 percent.

Polycyclic Aromatic Compounds

INTRODUCTION

Polycyclic aromatic compounds (PACs), also known as polycyclic aromatic hydrocarbons (PAHs), are a group of over 100 different chemicals that are characterized by hydrogen and carbon arranged in two or more fused benzene rings. PACs originate from both natural and anthropogenic sources. As pure chemicals, PACs generally exist as colorless, white, or pale yellow-green solids. Most PACs do not occur alone in the environment; rather, they are found as a mixture of two or more PACs. High concentrations of PACs are present in substances such as fuel oil, coal, coal tar pitch, creosote, and road and roofing tar. The TRI PACs category consists of 21 specifically listed compounds as listed in Box 3-4.

Box 3-4: Polycyclic Aromatic Compounds Category

CAS Number	Chemical Name
56-55-3	Benzo(a)anthracene
205-99-2	Benzo(b)fluoranthene
205-82-3	Benzo(j)fluoranthene
207-08-9	Benzo(k)fluoranthene
206-44-0	Benzo(j,k)fluorine
189-55-9	Benzo(r,s,t)pentaphene
218-01-9	Benzo(a)phenanthrene
50-32-8	Benzo(a)pyrene
226-36-8	Dibenz(a,h)acridine
224-42-0	Dibenz(a,j)acridine
53-70-3	Dibenzo(a,h)anthracene
194-59-2	7H-dibenzo(c,g)carbazole
5385-75-1	Dibenzo(a,e)fluoranthene
192-65-4	Dibenzo(a,e)pyrene
189-64-4	Dibenzo(a,h)pyrene
191-30-0	Dibenzo(a,l)pyrene
57-97-6	7,12-dimethylbenz(a)anthracene
193-39-5	Indeno(1,2,3-cd)pyrene
56-49-5	3-Methylcholanthrene
3697-24-3	5-Methylchrysene
5522-43-0	1-Nitropyrene

For the purpose of this report, these chemicals are profiled as a group. Benzo(g,h,i)perylene is another PAC which is listed separately from the PAC category in TRI and is discussed separately in this section. Benzo(g,h,i)perylene is listed separately because unlike all the members of the PACs category which were added to TRI based on concerns for carcinogenicity, benzo(g,h,i)perylene was added based on concerns for ecotoxicity.

More details on the TRI PACs, their sources, chemical characteristics, health and environmental effects and efforts being undertaken to reduce pollution from PACs can be found in the *2000 Toxics Release Inventory Public Data Release Report* (EPA 260-R-02-003).

2001 TRI DATA FOR POLYCYCLIC AROMATIC COMPOUNDS

On-site and Off-site Releases, 2001

As shown in Table 3-53, there were 3,813 TRI forms submitted for polycyclic aromatic compounds for 2001. On- and off-site releases for polycyclic aromatic compounds totaled 3.0 million pounds, with 2.9 million pounds of this reported as the chemical category of polycyclic aromatic compounds.

Off-site releases (transfers to disposal) were the largest type of release for both the chemical category polycyclic aromatic compounds and the chemical benzo(g,h,i)perylene. Off-site releases accounted for 54.3 percent of total releases or 1.6 million pounds (see Figure 3-10). The second largest release type was air emissions, which accounted for 39.4 percent or 1.2 million pounds. The next largest types of releases were on-site land releases to RCRA subtitle C landfills of 97,094 pounds, accounting for 3.3 percent, and other on-site land releases of 71,293 pounds or 2.4 percent. (Types of on-site land releases are described in Box 1-4 in Chapter 1.)

Table 3-53: TRI On-site and Off-site Releases, 2001: Polycyclic Aromatic Compounds

			On-site Releases							Off-site Releases	
					Underground Injection		On-site Land Releases				
CAS Number	Chemical	Total Forms	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
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
	Total	**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**

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

Much smaller amounts of the other types of releases were reported for 2001. Surface water discharges were 17,070 pounds, and underground injection of polycyclic aromatic compounds was 335 pounds.

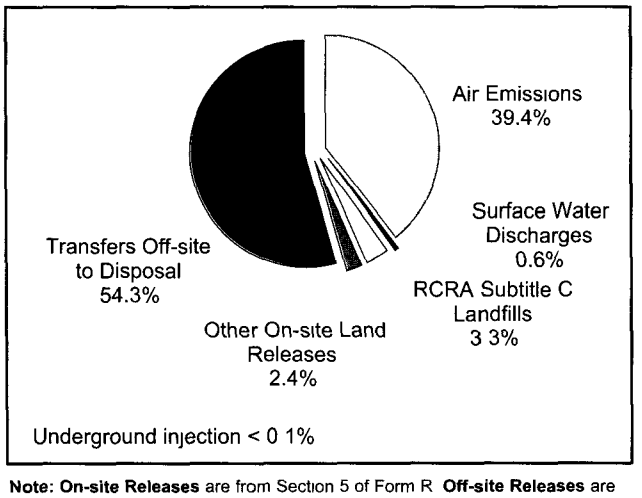
Waste Management Data, 2001

Quantities of TRI Chemicals in Waste

Polycyclic aromatic compounds in production-related waste totaled 25.0 million pounds in 2001, as shown in Table 3-54. Over 94.7 percent was reported as the chemical category polycyclic aromatic compounds.

A total of 10.4 million pounds (41.6 percent) of polycyclic aromatic compounds in production-related waste was burned for energy recovery on-site in 2001 (see Figure 3-11). Treatment on-site accounted for 32.7 percent or 8.2 million pounds and releases on- and off-site site accounted for 12.1 percent, or 3.0 million pounds. Recycling on-site was 2.2 million pounds or 8.7 percent, and the other types of waste management accounted for 4.9 percent of the total.

Figure 3-10: Distribution of TRI On-site and Off-site Releases, 2001: Polycyclic Aromatic Compounds



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

Transfers Off-site for Further Waste Management, including Disposal

Transfers off-site for further waste management, including disposal, of polycyclic aromatic compounds totaled 2.9 million pounds in 2001 (see Table 3-55). Transfers of the chemical category polycyclic aromatic compounds accounted for 2.8 million pounds or 95.5 percent of the total.

More than half of the transfers for further waste management, including disposal, of polycyclic aromatic compounds were other transfers off-site to disposal (1.7 million pounds) (see Figure 3-12). Transfers to recycling accounted for 31.6 percent (917,122 pounds), transfers to energy recovery were 6.4 percent (186,015 pounds) and transfers to treatment were 4.1 percent (119,572 pounds). Other types of transfers were less than one percent of total transfers for further waste management, including disposal, of polycyclic aromatic compounds for 2001.

TRI Data by State

Facilities in Massachusetts, with 274 forms, submitted the largest number of forms in 2001 for polycyclic aromatic compounds. Three other states,

Table 3-54: Quantities of TRI Chemicals in Waste, 2001: Polycyclic Aromatic Compounds

CAS Number	Chemical	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On- and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-production-related Waste Managed Pounds
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
	Total	**2,181,079.52**	**860,183.75**	**10,401,981.02**	**178,811.78**	**8,181,690.39**	**180,866.39**	**3,017,847.94**	**25,002,460.79**	**18,875.05**

Note: Data are from Section 8 of Form R

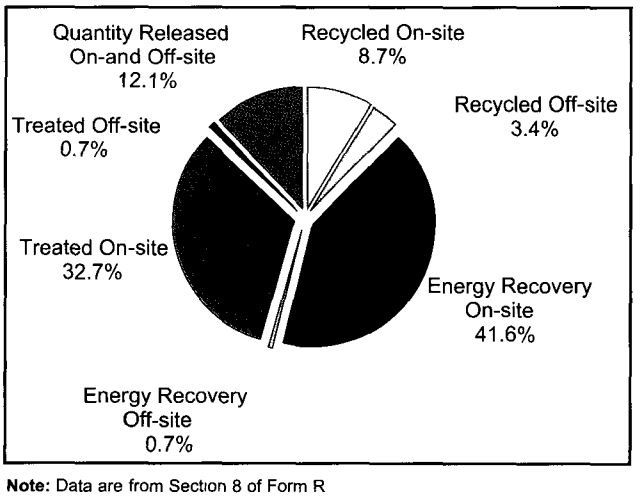
Texas, Pennsylvania, and New York, also had more than 200 forms, with 269, 217, and 213 forms respectively.

On- and Off-site Releases

In 2001, facilities in the state of Ohio reported the largest total on- and off-site releases of polycyclic aromatic compounds (see Table 3-56). They reported a total of 789,015 pounds, or one-quarter of the total releases of polycyclic aromatic compounds for 2001. The state of Washington accounted for 377,284 pounds of releases or 12.6 percent of the total, and the state of West Virginia was third with 341,762 pounds or 11.4 percent.

More than half (52.5 percent or 414,421 pounds) of Ohio's releases of polycyclic aromatic compounds were air emissions, with most of the rest of Ohio's releases being off-site releases (transfers off-site to disposal). Ohio facilities reported the largest amount of air emissions of any state, with 35.2 percent of total air emissions of polycyclic aromatic compounds.

Figure 3-11: Distribution of Quantities of TRI Chemicals in Waste, 2001: Polycyclic Aromatic Compounds



Note: Data are from Section 8 of Form R

As shown in Map 3-4, releases of polycyclic aromatic compounds show some degree of geographic concentration. Five states, Ohio, Washington, West Virginia, Louisiana and South Carolina, each released more than 100,000 pounds, and another seven states each released more than 50,000 pounds of polycyclic aromatic compounds in 2001.

Waste Management Data

Tennessee had the largest quantity of polycyclic aromatic compounds in production-related waste of any state in 2001 (see Table 3-57). Tennessee facilities reported 4.2 million pounds of polycyclic aromatic compounds in total production-related waste and accounted for 16.8 percent of polycyclic aromatic compounds in production-related waste. Texas ranked second with 3.3 million pounds (13.1 percent of the total), and Louisiana was third with 2.7 million pounds (10.6 percent of the total).

A total of 3.4 million pounds of polycyclic aromatic compounds in production-related waste in Tennessee was burned for energy recovery on-site. This represented 81.6 percent of the total reported by Tennessee and accounted for 32.9 percent of all on-site energy recovery of polycyclic aromatic compounds in 2001.

For Texas, the largest component of polycyclic aromatic compounds in production-related waste was also on-site energy recovery, a total of 2.2 million pounds, representing 21.1 percent of the nation's total on-site energy recovery of these compounds and 66.7 percent of Texas' polycyclic aromatic compounds in production-related waste. Michigan reported the largest amount treated on-site, 1.9 mil-

Table 3-55: TRI Transfers Off-site for Further Waste Management, including Disposal, 2001: Polycyclic Aromatic Compounds

CAS Number	Chemical	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs: Metals and Metal Category Compounds Pounds	Transfers to POTWs: Non-metal TRI Chemicals Pounds	Other Off-site Transfers* Pounds	Other Off-site Transfers to Disposal** Pounds	Total Transfers for Further Waste Management, including Disposal Pounds
191-24-2	Benzo(g,h,i)perylene	37,468 68	3,754 58	1,755 55	0 00	328.62	0 00	86,393 81	129,701 24
--	Polycyclic aromatic compounds	879,653 57	182,260 28	117,815 97	0 00	6,048 97	105 82	1,585,032 64	2,770,917 24
	Total	**917,122.25**	**186,014.86**	**119,571.52**	**0.00**	**6,377.58**	**105.82**	**1,671,426.45**	**2,900,618.49**

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

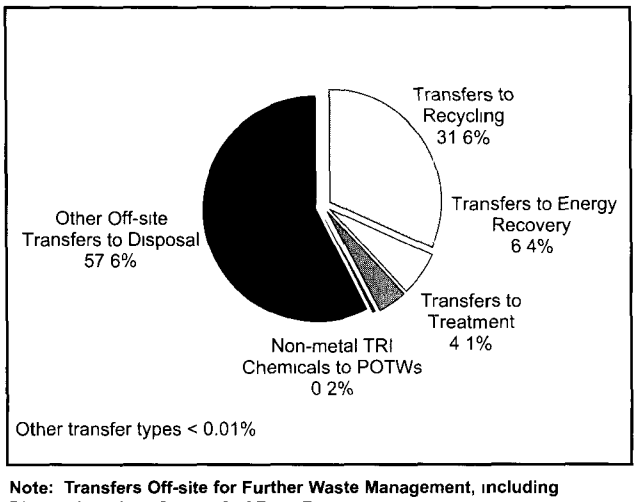
lion pounds, which was 23.4 percent of total on-site treatment of polycyclic aromatic compounds in 2001. Ohio reported the largest quantity released on- and off-site, with 797,973 pounds, accounting for 26.4 percent of all releases on- and off-site of polycyclic aromatic compounds in 2001.

TRI Data by Industry

On- and Off-site Releases

The primary metals industry reported the largest total releases of any industry sector, 1.2 million pounds or 38.7 percent of the total on- and off-site releases of polycyclic aromatic compounds in 2001 (see Table 3-58). The chemical manufacturing industry had the second largest total releases, with 504,964 pounds of total releases. Two other sectors, petroleum refining and plastics manufacturing, had over 200,000 pounds of releases of polycyclic aromatic compounds in 2001.

Figure 3-12: Distribution of TRI Transfers Off-site for Further Waste Management, including Disposal, 2001: Polycyclic Aromatic Compounds



Note: Transfers Off-site for Further Waste Management, including Disposal are from Section 6 of Form R

A total of 624,009 pounds or 54.0 percent of the releases from the primary metals industry were off-site releases (transfers to disposal), and 528,212 pounds or 45.7 percent were air emissions. Off-site releases from the primary metals industry accounted for 38.5 percent of the total for all industries, and air emissions from the primary metals industry were 44.9 percent of total air emissions.

Over 85 percent of the chemical industry's total releases, the sector with the second largest releases, were off-site releases (transfers to disposal). The chemical industry reported 433,828 pounds of off-site releases. Petroleum refining, with the third largest releases (392,777 pounds) reported over half (232,776 pounds or 59.3 percent) as off-site releases (transfers to disposal).

Waste Management

The electrical equipment industry reported the largest amount of polycyclic aromatic compounds in production-related waste of polycyclic aromatic compounds in 2001 (see Table 3-59). With 5.3 million pounds of polycyclic aromatic compounds in production-related waste, this industry sector accounted for 21.3 percent of all production-related waste for these compounds.

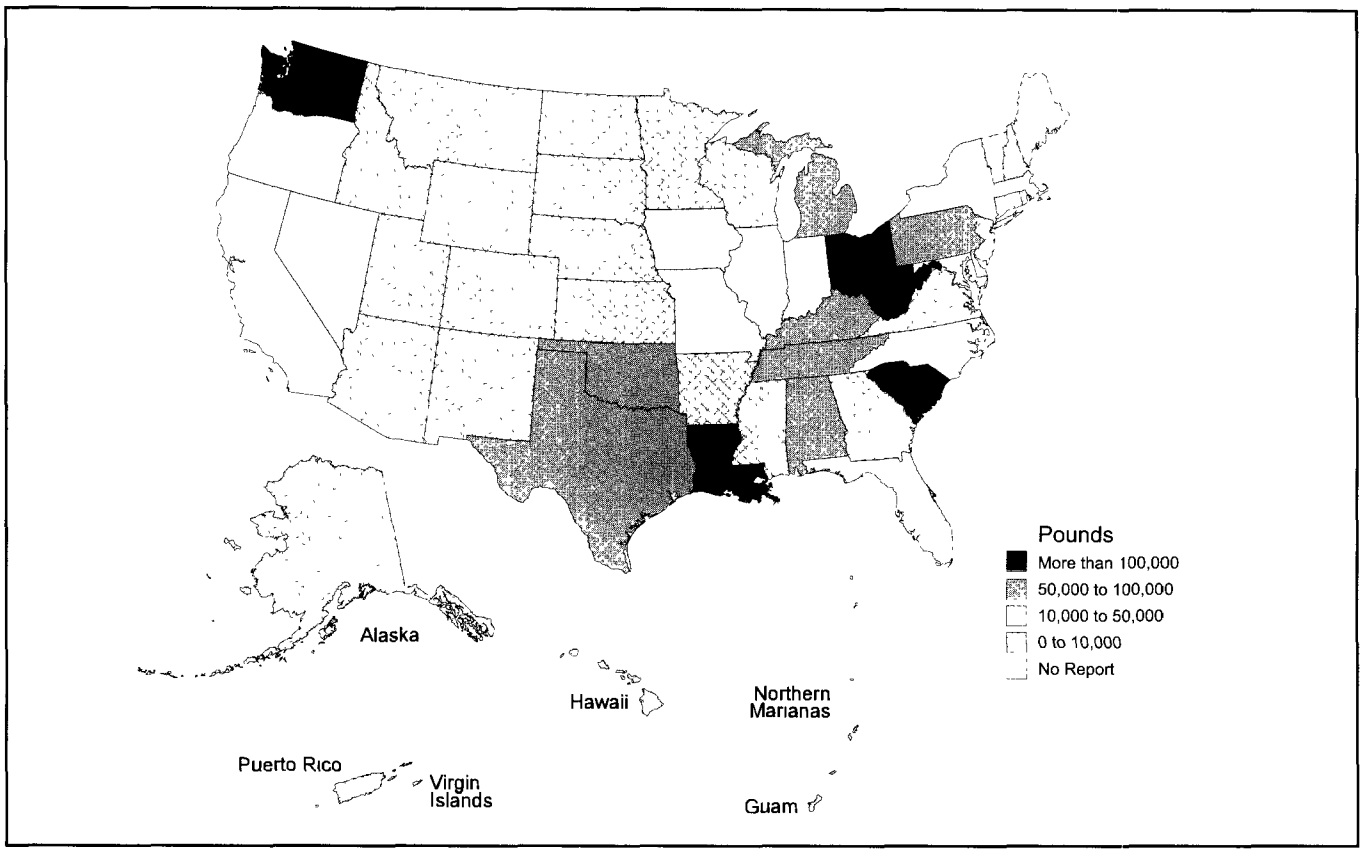
More than two-thirds (3.6 million pounds) of the polycyclic aromatic compounds in production-relat-

Table 3-56: TRI On-site and Off-site Releases, by State, 2001: Polycyclic Aromatic Compounds

		On-site Releases							Off-site Releases	Total
				Underground Injection		On-site Land Releases				
State	Total Forms	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	On- and Off-site Releases
	Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Alabama	91	16,842.75	400.94	0.00	0 00	9,022 00	5,642 08	31,907.77	62,941 24	94,849 01
Alaska	12	1,235 60	20 10	0 00	0 00	0 00	39 00	1,294.70	28 80	1,323 50
American Samoa	1	0.00	0 00	0.00	0 00	0.00	0 00	0.00	0 00	0 00
Arizona	38	1,215 69	0 00	0 00	0 00	0 00	423 40	1,639 09	0 40	1,639 49
Arkansas	35	5,077 63	189 10	0.00	0 00	0 00	711.81	5,978 54	621.53	6,600 07
California	167	1,519 86	360 94	0 00	0 00	31,061 04	3,406 95	36,348 78	144 81	36,493 59
Colorado	50	358.83	6.06	0 00	0.00	0 00	0.00	364.89	20 64	385.53
Connecticut	153	17,866 51	0 00	0 00	0 00	0 00	92 55	17,959 06	500 41	18,459 47
Delaware	23	122.05	4 00	0 00	0.00	0.00	0.00	126.05	0 00	126 05
District of Columbia	3	0 10	0 00	0 00	0 00	0 00	0 00	0 10	1 90	2 00
Florida	133	12,084.39	68 46	0 00	0.00	0.00	9,297.40	21,450.25	812.73	22,262 97
Georgia	100	3,392 30	146 13	0 00	0.00	0.00	370 02	3,908.45	2,498 69	6,407 14
Guam	10	772 65	0.00	0.00	0.00	3.00	4 70	780.35	0.00	780.35
Hawaii	32	1,220 16	253 00	0.00	0 00	0 00	0 42	1,473 58	3 00	1,476 58
Idaho	4	161.30	27.40	0.00	0 00	0 00	89.80	278.50	0 30	278 80
Illinois	75	17,385 77	58 10	0 00	0 00	2,112 00	147 59	19,703 46	24,833 71	44,537 17
Indiana	90	29,568.16	89.00	0 00	0.00	0.00	860.00	30,517.16	14,461 03	44,978.19
Iowa	40	24,623 26	0 00	0 00	0 00	0 00	0 00	24,623 26	5,614 00	30,237 26
Kansas	38	1,835.17	20.40	0.00	0.00	0 00	327.80	2,183.37	119.99	2,303 36
Kentucky	55	74,466 33	39 50	0 00	332 95	0 00	673 65	75,512 43	3,326 30	78,838 73
Louisiana	85	83,215.11	8,837.45	0 00	0.00	7,270.00	265.05	99,587 61	186,309 39	285,897 00
Maine	86	4,167 57	74 94	0 00	0 00	0 00	183 39	4,425 90	177 25	4,603 15
Maryland	66	21,523.32	0.00	0 00	0 00	0.00	403 00	21,926.32	7,624.57	29,550 89
Massachusetts	274	33,368 01	0 61	0 00	0 00	0 00	12 20	33,380 82	107 80	33,488 62
Michigan	83	38,238.94	46.53	0 00	0 00	15,962.00	614.38	54,861.85	12,226 35	67,088.21
Minnesota	67	4,248 88	0 00	0 00	0 00	0 00	52 65	4,301 53	742 06	5,043 59
Mississippi	30	2,481.66	140.20	0 00	0.00	0.00	278 21	2,900 07	2,564.30	5,464 37
Missouri	49	6,871 20	0 40	0 00	0.00	0 00	0 20	6,871 80	15,580 58	22,452 38
Montana	18	2,366.90	7 00	0 00	0.00	0.00	886.10	3,260 00	53.10	3,313 10
Nebraska	14	376 60	0 00	0 00	0 00	0 00	0 00	376 60	76 23	452 82
Nevada	9	1,022.11	0 00	0 00	0.00	0 00	2,669 00	3,691.11	8,203 30	11,894 41
New Hampshire	48	231 87	106 02	0 00	0 00	0 00	0 00	337 89	314 49	652 38
New Jersey	116	1,150 90	35.90	0.00	0.00	381.50	0.40	1,568.70	1,319 27	2,887.97
New Mexico	21	26 25	0 00	0 00	0 00	0 00	0 00	26 25	4 50	30 75
New York	213	22,211.50	25 02	0.00	0.00	0.00	13 90	22,250 43	10,522 50	32,772 93
North Carolina	140	31,560 52	108 80	0 00	0 00	0 00	140 30	31,809.62	8,295 19	40,104 81
North Dakota	14	242 94	0 00	0.00	0.00	0.00	29.48	272.42	6 45	278 87
Northern Marianas	6	0 69	0 00	0 00	0 00	0 00	0 30	0 99	0 00	0 99
Ohio	163	414,421 38	111 42	0 00	0.00	0 00	1,360 38	415,893 18	373,121.79	789,014 97
Oklahoma	35	2,461 48	21 20	0 00	0 00	0 00	176 99	2,659 67	87,321 59	89,981 26
Oregon	35	3,128.24	66.20	0.00	0.00	31,238.51	59.29	34,492 24	155.15	34,647.39
Pennsylvania	217	43,154 27	143 49	0 00	0 00	0 00	5,147 93	48,445 68	33,052 99	81,498 67
Puerto Rico	42	810 32	5 20	0.00	0.00	0 00	0 00	815.52	0 00	815 53
Rhode Island	45	990 75	5 09	0 00	0 00	0 00	0 00	995 85	72 83	1,068 68
South Carolina	119	96,369 12	70 96	0 00	0.00	0.00	251 94	96,692 02	60,488 76	157,180.78
South Dakota	9	8 15	0 90	0 00	0 00	0 00	0 00	9 05	492 50	501 55
Tennessee	77	29,675.65	190 42	0.00	0.00	0 00	35,080.45	64,946 52	1,423.25	66,369 77
Texas	269	59,748 35	4,855 29	2 10	0 00	44 00	1,046 26	65,695 99	17,584 37	83,280 37
Utah	23	5,016 18	73 50	0.00	0.00	0.00	10.00	5,099 68	4,031 52	9,131.20
Vermont	18	284 62	0 00	0 00	0 00	0 00	0 00	284.62	0 00	284 62
Virgin Islands	8	2,539.03	1.00	0.00	0 00	0.00	0 00	2,540 03	2 00	2,542.03
Virginia	93	9,140 35	48 94	0 00	0 00	0 00	7 50	9,196 79	180 61	9,377 40
Washington	69	22,812 13	292.00	0.00	0 00	0 00	464.37	23,568.50	353,715.93	377,284.43
West Virginia	34	22,260 96	72 38	0 00	0 00	0 00	0 00	22,333 34	319,428 59	341,761 93
Wisconsin	59	1,492 91	44 70	0.00	0 00	0.00	51.68	1,589.28	1,537.66	3,126.94
Wyoming	9	213 92	1 06	0.00	0 00	0 00	0 00	214 98	118 55	333 53
Total	**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**

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

Map 3-4: Total On- and Off-site Releases, 2001: Polycyclic Aromatic Compounds



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

ed waste reported by the electrical equipment industry was burned for energy recovery on-site. The electrical equipment industry reported 1.4 million pounds treated on-site (26.1 percent of the production-related waste of polycyclic aromatic compounds from the sector).

Electric utilities had the second largest amount of polycyclic aromatic compounds in production-related waste, with 4.9 million pounds or 19.7 percent of the total for polycyclic aromatic compounds in 2001. Almost two-thirds of it (3.3 million pounds) was treated on-site and one-third (1.6 million pounds) was burned for energy recovery on-site.

The chemical manufacturing industry reported the third largest amount of polycyclic aromatic compounds in production-related waste, with 4.6 million pounds or 18.5 percent of total polycyclic aromatic compounds in production-related waste in 2001. Most of this (3.2 million pounds) was burned for on-site energy recovery.

Projected Quantities of TRI Chemicals Managed in Waste, 2001-2003

TRI facilities expected to decrease their amount of polycyclic aromatic compounds in production-related waste between 2001 and 2002 by 9.7 percent, from 25.0 million pounds to 22.6 million pounds. An increase was projected from 2002 to 2003 of 4.8 percent, to 23.7 million pounds (see Table 3-60). The overall decrease projected from 2001 to 2003 was 5.3 percent.

The decrease from 2001 to 2002 was projected to occur primarily in the quantity burned for energy recovery on-site, which was projected to decrease

Table 3-57: Quantities of TRI Chemicals in Waste, by State, 2001: Polycyclic Aromatic Compounds

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	12,290.30	6,821.40	0.00	848.80	30,963.11	4,075.10	84,990 24	139,988 95	143.41
Alaska	0 00	0 00	0 00	0 20	1,013 78	0 40	1,318 40	2,332 78	13 10
American Samoa	0.00	0.00	128.50	0.00	0 00	0.00	0.00	128.50	0 00
Arizona	0 00	0.00	106,979 90	0.00	539,677 08	167 10	1,639.47	648,463.55	0 00
Arkansas	466 00	4.40	2,312 00	8,037 20	735,476.05	13,355.80	5,827.25	765,478.70	222.50
California	73 00	1,858 97	1 00	0 20	2 20	1,898 25	36,909 57	40,743 19	383 10
Colorado	0.00	1,599.29	0 00	8.70	135,762 05	1,221.00	377.63	138,968.68	0.30
Connecticut	296.00	187 20	3,234 10	0 10	12,000 00	611.67	18,368 57	34,697 64	0.00
Delaware	0.00	0.00	210.00	0.00	400 00	0.00	126.13	736.13	0.00
District of Columbia	0 00	0.00	0 00	0 00	0 00	0.00	2 00	2 00	0 00
Florida	0.00	2,440.03	22,626.90	146.61	374 07	1,302.03	22,232.08	49,121.72	68.05
Georgia	0 00	1,260.88	20,714 00	1.00	70 00	94 60	6,508 02	28,648 50	0.00
Guam	0 00	0 00	0.00	0.00	0.00	3 00	763.35	766.35	17.00
Hawaii	0 00	0 08	0 00	0.00	0 00	15.01	1,491 19	1,506 28	1 41
Idaho	0.00	0.00	0.00	0.00	0 00	0.00	284.30	284.30	0.00
Illinois	4,858 10	12,587 69	0.00	58,345 00	18,320 30	2,852.62	40,059 88	137,023 59	6,881.38
Indiana	129,139.50	11,268.00	6,208 00	746.60	354,941.00	164.20	44,608.58	547,075.88	2,058.75
Iowa	75 37	6,602 80	6,773 00	738 70	0.00	128 00	30,145 25	44,463 12	0 00
Kansas	9.00	26 50	0 00	3 00	15.00	21.50	561.03	636.03	0.00
Kentucky	0 00	5,589 00	183,938 00	3 00	530,306 40	3,444 84	79,158 55	802,439 79	544 80
Louisiana	252,083.00	329,781 00	1,171,350.00	20,249.00	551,149 93	41,885.62	293,053.34	2,659,551.89	0.40
Maine	0 00	0 00	471,782 00	1,036 70	93 80	1,215 00	5,616.30	479,743 80	21 30
Maryland	332,511.20	2,040.35	611,450.20	0.00	12,483 20	1,463 97	29,921.51	989,870.43	0.00
Massachusetts	798.35	2,052 05	32,177 22	1,026 12	17,868 00	57 55	34,620 34	88,599 63	672 66
Michigan	37.00	4,319.40	3,073.80	151 70	1,918,326.80	94.05	66,802.61	1,992,805.36	3 64
Minnesota	5,250 70	5,949.53	103,081 00	1,019 04	198 06	118 96	5,043 40	120,660.70	202 76
Mississippi	829.07	1,764.00	144,097.80	3,410 40	15.20	45,160 10	8,674.95	203,951.52	581.90
Missouri	0 14	19,606.00	170 00	906 00	2,027 60	6,179 22	21,323 16	50,212 12	4 00
Montana	370.42	183 20	0.00	0.00	5 78	0.00	3,312.33	3,871.72	0.77
Nebraska	35 64	3,894 00	0.00	1 13	431 00	0 37	452 80	4,814 95	0 00
Nevada	0.00	0 00	993,336.00	6 90	0 00	0.00	11,849.60	1,005,192.50	6 01
New Hampshire	125 44	0 00	10,085 94	62 10	0 00	5.06	787 04	11,065 58	22 63
New Jersey	15.53	2,232.04	0 00	37 87	20,605.53	580.23	2,546.89	26,018.08	150 20
New Mexico	0 00	4,311 00	234,392 00	0 00	26,128 00	22 00	30 75	264,883 75	0 00
New York	76,346.60	3,581.24	3,874.30	115.02	156,461 90	2,479 57	32,794.29	275,652 92	0 00
North Carolina	25,643 00	7,052.10	1 65	183 91	224,547 80	538.82	40,390 56	298,357 85	0 00
North Dakota	0 00	0.00	0.00	0.00	0.00	0.00	282 45	282.45	0 00
Northern Marianas	0 00	0 00	0 00	0 00	0 00	0 00	1.09	1 09	0 00
Ohio	1,179 32	114,619.61	594.20	24,407.00	701,014.90	2,688.95	797,972.72	1,642,476.71	0 00
Oklahoma	75,000 20	93,942 22	141,695 00	357 50	0.00	1,572 60	92,344 56	404,912 08	0 96
Oregon	0 00	75 30	1,983.00	13,901.69	0 00	191 12	48,545 78	64,696 89	2.00
Pennsylvania	379,501 60	89,755 52	304,180 87	388 30	202,628 57	8,166.38	76,417 67	1,061,038.91	4,615 04
Puerto Rico	0.00	1,617 00	35,963.00	0.00	0.00	6.91	815.45	38,402 36	1 52
Rhode Island	0 00	1 10	0 01	26 00	0 00	0 10	1,008 16	1,035.37	166.90
South Carolina	503,728 00	35,616 12	52,055.96	0 00	97,084 20	3,307 74	155,630 00	847,422 02	0.00
South Dakota	0 00	0 00	0 00	0.00	0 00	1,169 90	502.35	1,672 25	0 00
Tennessee	100,693 34	21,428.18	3,420,437.56	968.60	566,810 27	1,171 90	82,681.92	4,194,191 77	0.00
Texas	188,967 01	54,847 10	2,190,260 63	41,350 50	693,963 32	31,625 53	81,440 70	3,282,454 79	446 45
Utah	972.59	1.60	0.00	0.00	7,703 53	379.32	9,133 34	18,190.38	42.72
Vermont	0 00	719 00	0 00	3 20	0.00	0 00	284 62	1,006 82	0 00
Virgin Islands	0 00	0.00	0 00	0 00	0.00	0 00	2,542.03	2,542.03	0.00
Virginia	13 10	5,021 76	0 00	214 29	60,078 30	568 26	9,069 05	74,964 76	320.27
Washington	78,702 00	0.00	102,727.70	3.70	488,625 96	632.10	390,844.14	1,061,535.60	1,173 80
West Virginia	3,460 00	1,952 00	13 68	0 00	9,304 70	0.00	328,426 61	343,156 99	59 00
Wisconsin	7,609 00	3,575 10	7 10	106 00	63,513.00	161.20	3,126 53	78,097 93	0.00
Wyoming	0 00	0 00	20,065 00	0 00	1,300 00	68 73	4,187 40	25,621 13	46.33
Total	**2,181,079.52**	**860,183.75**	**10,401,981.02**	**178,811.78**	**8,181,690.39**	**180,866.39**	**3,017,847.94**	**25,002,460.79**	**18,875.05**

Note: Data are from Section 8 of Form R

by 20.6 percent from 2001 to 2002. The increase between 2002 and 2003 was projected to occur primarily in quantities burned for energy recovery on-site and in quantities released on- and off-site. 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).

The actual change in polycyclic aromatic compounds in production-related waste from the prior

Table 3-58: TRI On-site and Off-site Releases, by Industry, 2001: Polycyclic Aromatic Compounds

			On-site Releases							Off-site Releases	
					Underground Injection		On-site Land Releases				
SIC Code	Industry	Total Forms	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
10	Metal Mining	9	2,421 36	0 00	0 00	0 00	0 00	423 40	2,844 76	0 00	2,844 76
20	Food	259	108,618 46	0 00	0 00	0 00	3 50	38 84	108,660 80	51 50	108,712 30
21	Tobacco	2	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
22	Textiles	173	44,581 09	0 00	0 00	0 00	0 00	0 00	44,581 09	0 02	44,581 11
24	Lumber	77	3,754 74	175 92	0 00	0 00	0 00	17 75	3,948 40	14,833 60	18,782 00
26	Paper	310	59,978 57	1,118 17	0 00	0 00	0 00	1,716 72	62,813 46	703 48	63,516 94
27	Printing	8	5,465 00	0 00	0 00	0 00	0 00	0 00	5,465 00	0 00	5,465 00
28	Chemicals	294	52,203 71	8,796 49	1 10	0 00	422 00	9,712 59	71,135 89	433,827 77	504,963 66
29	Petroleum	573	149,722 37	5,482 49	0 00	0 00	38 84	4,756 79	160,000.48	232,776 31	392,776 79
30	Plastics	130	20,238 12	0 25	0 00	0 00	0 00	5 69	20,244 06	226,120 16	246,364 23
31	Leather	6	26 16	0 00	0 00	0 00	0 00	0 00	26 16	0 00	26 16
32	Stone/Clay/Glass	49	20,126 01	0 00	0 00	332 95	0 00	4,611 05	25,070 0[illegible]	687 20	25,757 21
33	Primary Metals	114	528,211 56	628 07	0 00	0 00	0 00	1,756 00	530,595 63	624,008 70	1,154,604 33
34	Fabricated Metals	34	3,257 92	0 00	0 00	0 00	0 00	0 00	3,257 92	0 00	3,257 92
35	Machinery	30	9,684 85	0 00	0 00	0 00	0 00	5 00	9,689 85	0 00	9,689 85
36	Electrical Equip	63	43,921 83	165 64	0 00	0 00	0 00	33,533 70	77,621 17	42,753 94	120,375 11
37	Transportation Equip	89	19,341 60	0 00	0 00	0 00	0 00	79 05	19,420 65	158 00	19,578 65
38	Measure/Photo	27	12,594 44	2 00	0 00	0 00	0 00	0 00	12,596 44	7 81	12,604 25
39	Miscellaneous	20	840 04	0 00	0 00	0 00	0 00	0 00	840 04	577 20	1,417 24
--	Multiple codes 20-39	152	64,256 76	507 18	0 00	0 00	2,112 00	4,862 90	71,738 84	20,025 30	91,764 14
--	No codes 20-39	26	5,099 64	0 00	0 00	0 00	0 00	4,887 01	9,986 65	5,801 00	15,787 65
491/493	Electric Utilities	654	8,558 64	39 91	0 00	0 00	0 00	3,705 11	12,303 66	8,990 69	21,294 35
5169	Chemical Wholesale Distributors	5	3 40	0 00	0 00	0 00	0 00	0 00	3 40	0 00	3 40
5171	Petroleum Terminals/Bulk Storage	607	14,352 76	147 44	0 00	0 00	3 00	786 43	15,289 63	2,723 89	18,013 52
7389/4953	Hazardous Waste/Solvent Recovery	102	322 25	6 21	1 00	0 00	94,514 71	394 49	95,238 66	8,738 32	103,976 98
	Total	**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**

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.

Table 3-59: Quantities of TRI Chemicals in Waste, by Industry, 2001: Polycyclic Aromatic Compounds

		Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Wast Managed	Non-production-related Waste Managed
SIC Code	Industry	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	Pounds	Pounds	Pounds
10	Metal Mining	0 00	0 00	0 00	29 60	0 00	118 70	2,844 76	2,993 06	0 00
20	Food	0 00	1 25	1,128,843 97	0 00	69,350 94	48 00	106,633 86	1,304,878 02	528 90
21	Tobacco	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
22	Textiles	0 00	0 00	34,699 00	0 00	0 00	2 42	44,261 26	78,962 68	320 29
24	Lumber	7,905 30	15 30	433,915 20	24,489 10	12,214 90	94,519 60	38,412 60	611,472 00	837 30
26	Paper	0 00	0 10	45,999 04	98 00	17,422 18	1,293 70	81,199 00	146,012 02	1 21
27	Printing	0 00	0 00	0 00	0 00	0 00	0 00	5,465 00	5,465 00	0 00
28	Chemicals	15,262 20	148,826 00	3,225,185 99	65,381 49	615,394 55	55,433 95	502,085 12	4,627,569 30	943 13
29	Petroleum	412,150 57	339,821 55	162,106 80	77,433.64	816,361 86	8,516 14	406,938 35	2,223,328 91	8,422 10
30	Plastics	75,237 61	108,654 39	3,234 00	2,055 30	24,000 00	2,894 44	238,179 17	454,254 91	10 00
31	Leather	0 00	0 00	577 00	2 91	0 00	0 00	26 16	606 07	0 00
32	Stone/Clay/Glass	0 00	0 00	6,208 00	14 80	746 30	0 00	25,100 50	32,069 60	676 20
33	Primary Metals	1,278,683 60	39,739 70	5,336 00	216 30	1,198,353 70	5,034 20	1,167,679 87	3,695,043 37	917 00
34	Fabricated Metals	0 00	0 00	0 00	2 00	0 00	0 00	3,258 00	3,260 00	0 00
35	Machinery	0 00	0 00	0 00	21 71	0 00	0 00	9,689 85	9,711 56	0.37
36	Electrical Equip	191,849 00	18,855 55	3,607,429 24	730 08	1,390,775 92	161 93	109,582 74	5,319,384 46	16 13
37	Transportation Equip	0 00	19 35	0 00	1 20	90 10	178 40	19,531 25	19,820 30	21 30
38	Measure/Photo	0 00	1 00	0 00	28 00	24 00	0 00	12,609 12	12,662 12	0 00
39	Miscellaneous	0 00	0 00	0 00	0 00	0.00	1,960 00	1,417 24	3,377 24	0 00
--	Multiple codes 20-39	103,288 79	71,667 50	105,161 00	0 70	62,723 50	630 21	90,710 24	434,181 94	4,756 41
--	No codes 20-39	96,151 00	0 00	1,081 22	0.00	77 00	4,914 00	10,908 65	113,131 87	1,069 00
491/493	Electric Utilities	37 00	1,630 79	1,639,892 55	652 71	3,263,994 50	96 45	21,301 32	4,927,605 31	81 15
5169	Chemical Wholesale Distributors	0 00	0 00	0 00	0 00	0 00	0 22	3 40	3 62	0 00
5171	Petroleum Terminals/Bulk Storage	514 45	1,166 28	0 01	824 65	47 00	1,970 46	16,032 68	20,555 53	274 55
7389/4953	Hazardous Waste/Solvent Recovery	0 00	129,785 00	2,312 00	6,829 59	710,113 94	3,093 56	103,977 81	956,111 90	0 00
	Total	**2,181,079.52**	**860,183.75**	**10,401,981.02**	**178,811 78**	**8,181,690 39**	**180,866 39**	**3,017,847.94**	**25,002,460.79**	**18,875.05**

Note. Data are from Section 8 of Form R

Table 3-60: Prior Year, Current Year and Projected Quantities of TRI Chemicals in Waste, 2000-2003: Polycyclic Aromatic Compounds

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	2,647,037 50	8 2	2,181,079.52	8.7	2,214,718 13	9.8	2,284,627.14	9.7
Recycled Off-site	597,242 14	1 9	860,183 75	3 4	871,214 83	3 9	833,543 63	3 5
Energy Recovery On-site	10,916,400 73	33.8	10,401,981 02	41 6	8,256,968.81	36 6	8,711,357.68	36.8
Energy Recovery Off-site	207,581 52	0 6	178,811 78	0 7	160,980 06	0 7	148,867 05	0 6
Treated On-site	12,964,525 14	40.2	8,181,690 39	32 7	8,165,114 33	36 2	8,385,797 73	35.4
Treated Off-site	245,409 93	0 8	180,866 39	0 7	144,337 75	0 6	156,810 59	0 7
Quantity Released On- and Off-site	4,700,580 14	14.6	3,017,847 94	12 1	2,769,650.40	12 3	3,145,009 26	13.3
Total Production-related Waste Managed	**32,278,777.10**	**100.0**	**25,002,460.79**	**100.0**	**22,582,984.30**	**100.0**	**23,666,013.07**	**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	-17.6	1.5	3.2	4.7
Recycled Off-site	44 0	1 3	-4.3	-3 1
Energy Recovery On-site	-4 7	-20.6	5.5	-16 3
Energy Recovery Off-site	-13 9	-10 0	-7 5	-16.7
Treated On-site	-36 9	-0.2	2.7	2.5
Treated Off-site	-26 3	-20 2	8 6	-13 3
Quantity Released On- and Off-site	-35 8	-8.2	13 6	4 2
Total Production-related Waste Managed	**-22.5**	**-9.7**	**4.8**	**-5.3**

Note: Data from Section 8 of Form R for 2001

year of 2000 to 2001 was a decrease of 22.5 percent, from 32.3 million pounds to 25.0 million pounds. This decrease occurred primarily in the amount treated on-site, which decreased by 36.9 percent. All types of waste management except for off-site recycling decreased from 2000 to 2001.

Source Reduction

In 2001, 284 forms were filed reporting source reduction activities for polycyclic aromatic compounds (see Table 3-61). As noted in **Waste Management** in Chapter 1, source reduction—an activity that prevents the generation of waste—is preferred to waste management. These 284 forms represented 7.4 percent of all forms submitted for polycyclic aromatic compounds in 2001.

The most frequently reported source reduction activity was good operating practices (listed on 120 forms). Spill and leak prevention came next, with 77 forms, followed by process modifications, with 53 forms.

On- and Off-site Releases, 2000-2001

On- and off-site releases of polycyclic aromatic compounds decreased from 5.0 million pounds to 3.0 million pounds from 2000 to 2001, a decrease of 39.8 percent (see Table 3-62). On-site releases of polycyclic aromatic compounds decreased by 25.6 percent (468,125 pounds), including a decrease in air emissions of 337,452 pounds or 22.3 percent. On-site land releases decreased by 129,946 pounds or 43.6 percent, including a decrease of 26.3 per-

Table 3-61: Number of Forms Reporting Source Reduction Activity, by Category, 2001: Polycyclic Aromatic Compounds

CAS Number	Chemical	Total Form Rs Number	Forms Reporting Source Reduction Activity: Number	Forms Reporting Source Reduction Activity: Percent of All Form Rs Percent	Category of Source Reduction Activity: Good Operating Practices Number	Inventory Control Number	Spill and Leak Prevention Number	Raw Materials Modifications Number	Process Modifications Number	Cleaning and Degreasing Number	Surface Preparation and Finishing Number	Product Modifications Number
191-24-2	Benzo(g,h,i)perylene	1,509	106	7 0	51	3	26	6	18	0	1	1
–	Polycyclic aromatic compounds	2,304	178	7 7	69	8	51	11	35	0	1	3
	Total	**3,813**	**284**	**7.4**	**120**	**11**	**77**	**17**	**53**	**0**	**2**	**4**

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

Table 3-62: TRI On-site and Off-site Releases, 2000-2001: Polycyclic Aromatic Compounds

	2000	2001	Change 2000-2001	
	Number	Number	Number	Percent
Forms	3,684	3,813	129	3 5
	Pounds	Pounds	Pounds	Percent
Total Air Emissions	1,515,033.49	1,177,581.28	-337,452 21	-22.3
Surface Water Discharges	18,130.85	17,069 76	-1,061 10	-5 9
Underground Injection	0.00	335.05	335.05	--
Class I Wells	0 00	2 10	2 10	--
Class II-V Wells	0.00	332.95	332.95	--
On-site Land Releases	298,333 04	168,386 56	-129,946.48	-43.6
RCRA Subtitle C Landfills	201,581.64	97,094 05	-104,487.60	-51.8
Other On-site Land Releases	96,751 40	71,292 51	-25,458 88	-26 3
Total On-site Releases	1,831,497.38	1,363,372.65	-468,124 73	-25.6
Off-site Releases				
Storage Only*	922.16	409.90	-512.26	-55.6
Solidification/Stabilization**	0.00	0 00	0 00	--
Metals and Metal Category Compounds Only Wastewater Treatment (Excluding POTWs)***	0 00	0.00	0.00	--
Metals and Metal Category Compounds Only Transfers to POTWs****	0 00	0.00	0 00	--
Metals and Metal Category Compounds Only Underground Injection	0 00	1,183.00	1,183.00	--
Landfills/Surface Impoundments	2,859,999 68	1,486,035.30	-1,373,964.38	-48.0
Land Treatment	365 63	185.99	-179.64	-49.1
Other Land Disposal	113,211.93	97,790.86	-15,421 07	-13.6
Other Off-site Management	209 59	98 21	-111 38	-53 1
Transfers to Waste Broker for Disposal	52,541.06	32,262.44	-20,278 62	-38.6
Unknown*****	101,051.53	4,819 19	-96,232 34	-95.2
Total Off-site Releases (Transfers Off-site to Disposal)	**3,128,301.59**	**1,622,784.90**	**-1,505,516.69**	**-48.1**
Total On- and Off-site Releases	**4,959,798.97**	**2,986,157.55**	**-1,973,641.42**	**-39.8**

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 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)

cent in on-site releases to RCRA subtitle C landfills and a 25.6 percent decrease in releases to other on-site landfills. Surface water discharges also decreased, by 5.9 percent or 1,061 pounds.

Off-site releases (transfers to disposal) also decreased from 2000 to 2001. The decrease was 1.5 million pounds or 48.1 percent. This was primarily due to decreases in the amount of polycylic aromatic compounds sent to landfills/surface impoundments. Such transfers decreased by 1.4 million pounds or 48.0 percent from 2000 to 2001.

Waste Management Data, 2000-2001

Quantities of TRI Chemicals in Waste, 2000-2001

Polycyclic aromatic compounds in production-related waste decreased from 30.0 million pounds in 2000 to 25.0 million pounds in 2001, a decrease of 16.6 percent (see Table 3-63). The amount treated on-site decreased by 2.6 million pounds or 24.4 percent. The quantity released on- and off-site decreased by 2.1 million pounds or 40.8 percent and on-site recycling decreased by 448,444 pounds or 17.1 percent.

Table 3-63: Quantities of TRI Chemicals in Waste by Waste Management Activity, 2000-2001: Polycyclic Aromatic Compounds

	2000 Pounds	2001 Pounds	Change 2000-2001 Pounds	Change 2000-2001 Percent
Recycled On-site	2,629,523.72	2,181,079.52	-448,444.20	-17.1
Recycled Off-site	628,115 68	860,183 75	232,068 07	36.9
Energy Recovery On-site	10,317,360.58	10,401,981.02	84,620.43	0.8
Energy Recovery Off-site	212,600.51	178,811 78	-33,788 73	-15.9
Treated On-site	10,824,267.94	8,181,690.39	-2,642,577.55	-24.4
Treated Off-site	258,769.07	180,866 39	-77,902.68	-30.1
Quantity Released On- and Off-site	5,094,811 48	3,017,847 94	-2,076,963.55	-40.8
Total Production-related Waste Managed	**29,965,448.99**	**25,002,460.79**	**-4,962,988.20**	**-16.6**
Non-production-related Waste Managed	64,761.24	18,875.05	-45,886.19	-70.9

Note: Data are from Section 8 of Form R of year indicated

Increases were reported in the amount of polycyclic aromatic compounds in waste recycled off-site, an increase of 232,068 pounds or 36.9 percent. The amount of polycyclic aromatic compounds in waste burned for energy recovery on-site also increased, by 84,620 pounds.

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

As shown in Table 3-64, transfers off-site for further waste management, including disposal, of polycyclic aromatic compounds decreased from 2000 to 2001, by 1.5 million pounds or 34.3 percent. Other off-site transfers to disposal decreased by 1.6 million pounds or 49.5 percent. Polycyclic aromatic compounds in waste sent for treatment also decreased, by 126,546 pounds or 51.4 percent.

Increases were reported in the amount of polycyclic aromatic compounds sent off-site for recycling. Such transfers increased by 273,949 pounds or 42.6 percent from 2000 to 2001. Transfers to POTWs of polycyclic aromatic compounds also increased, by 1,242 pounds or 24.2 percent.

Table 3-64: TRI Transfers Off-site for Further Waste Management, including Disposal, 2000-2001: Polycyclic Aromatic Compounds

	2000 Pounds	2001 Pounds	Change 2000-2001 Pounds	Change 2000-2001 Percent
Transfers to Recycling	643,173.29	917,122.25	273,948.97	42.6
Transfers to Energy Recovery	213,601.42	186,014 86	-27,586.57	-12 9
Transfers to Treatment	246,117.52	119,571.52	-126,545.99	-51.4
Transfers to POTWs	5,135.53	6,377 58	1,242 06	24 2
Metals and Metal Category Compounds Only	0.00	0.00	0.00	--
Non-metal TRI Chemicals	5,135.53	6,377 58	1,242 06	24.2
Other Off-site Transfers*	12.00	105.82	93.82	781.8
Other Off-site Transfers to Disposal**	3,309,397 06	1,671,426 45	-1,637,970.62	-49.5
Total Transfers for Further Waste Management, including Disposal	**4,417,436.82**	**2,900,618.49**	**-1,516,818.33**	**-34.3**

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

Polychlorinated Biphenyls (PCBs)

INTRODUCTION

Polychlorinated biphenyls, otherwise known as PCBs, were first created in 1881, and commercial manufacture began in 1929. PCBs were commercially produced by the chlorination of a biphenyl with anhydrous chlorine using iron filings or ferric chloride as a catalyst. Domestic production of PCBs was banned in 1976 under the Toxic Substances Control Act (TSCA). PCBs were used in a wide range of applications (electrical transformers and capacitors, hydraulic systems, heat transfer systems, and carbonless copy paper, among others), owing to a rare combination of properties, including high dielectric constant (good insulator), low flammability, high heat capacity, low chemical reactivity, long-term resistance to degradation, and low acute toxicity. PCBs are a group of 209 halogenated aromatic hydrocarbons that were commercially used and sold as a mixture of isomers. Of the 209 possible PCBs, only about 100 individual isomers are likely to occur at significant concentrations in commercial PCB mixtures.

More details on PCBs, their sources, chemical characteristics, health and environmental effects and efforts being undertaken to reduce pollution from PCBs can be found in the *2000 Toxics Release Inventory Public Data Release Report* (EPA 260-R-02-003).

2001 TRI DATA FOR POLYCHLORINATED BIPHENYLS

On-site and Off-site Releases, 2001

As shown in Table 3-65, there were 137 TRI forms submitted for polychlorinated biphenyls for 2001. On- and off-site releases for polychlorinated biphenyls totaled 2.5 million pounds. On-site releases to land to RCRA subtitle C landfills were the largest type of release, accounting for 90.4 percent of total releases or 2.3 million pounds (see Figure 3-13). The second largest release type was other on-site land releases, which accounted for 9.0 percent or 225,686 pounds. (Types of on-site land releases are described in Box 1-4 in Chapter 1.)

Much smaller amounts of other types of releases were reported. Off-site releases (transfers to disposal) totaled 12,251 pounds; air emissions were 1,360 pounds; and releases to surface water and underground injection of polychlorinated biphenyls totaled less than 3 pounds.

Waste Management Data, 2001

Quantities of TRI Chemicals in Waste

Polychlorinated biphenyls in production-related waste totaled 4.1 million pounds in 2001, as shown in Table 3-66. Most (2.5 million pounds or 61.7 percent) of the total was released on- and off-site (see Figure 3-14).

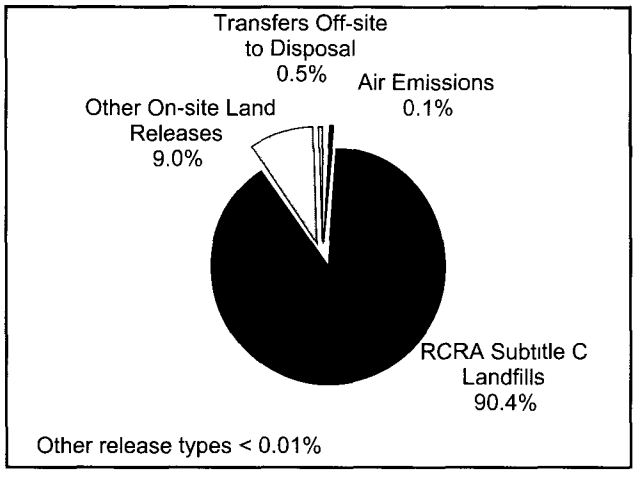
Another 1.3 million pounds of polychlorinated biphenyls were treated on-site, accounting for 31.8

Table 3-65: TRI On-site and Off-site Releases, 2001: Polychlorinated Biphenyls

			On-site Releases							Off-site Releases	
					Underground Injection		On-site Land Releases				
CAS Number	Chemical	Total Forms	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
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

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

Figure 3-13: Distribution of TRI On-site and Off-site Releases, 2001: Polychlorinated Biphenyls



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

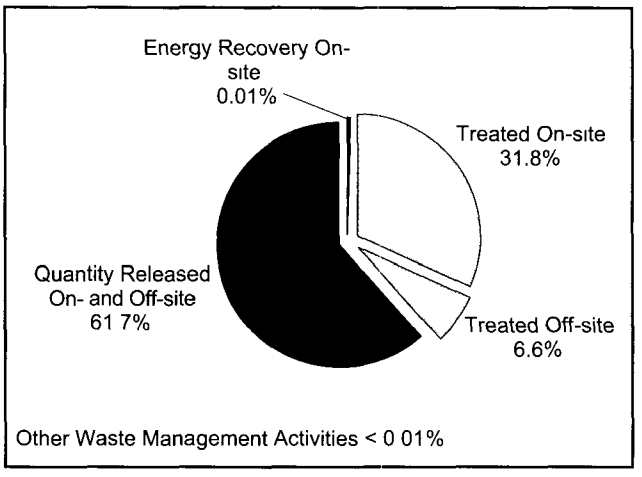
percent of the total in production-related waste in 2001. Treatment off-site was 270,767 pounds or 6.6 percent. Other types of waste management totaled less than 1,000 pounds.

Transfers Off-site for Further Waste Management, including Disposal

Transfers off-site for further waste management, including disposal, of polychlorinated biphenyls totaled 375,854 pounds in 2001 (see Table 3-67).

Transfers to treatment accounted for 84.1 percent of the transfers off-site for further waste management, including disposal, of polychlorinated biphenyls in 2001 (see Figure 3-15). Transfers to treatment totaled 316,076 pounds. Other transfers to disposal were 58,828 pounds or 15.7 percent of total transfers for further waste management, including disposal, of polychlorinated biphenyls for

Figure 3-14: Distribution of Quantities of TRI Chemicals in Waste, 2001: Polychlorinated Biphenyls



Note: Data are from Section 8 of Form R

2001. Other types of transfers totaled less than 1,000 pounds.

TRI Data by State

Facilities in North Carolina, with 10 forms, submitted the largest number of forms in 2001 for polychlorinated biphenyls. Texas facilities submitted 9 forms and Ohio facilities submitted 8 forms.

On- and Off-site Releases

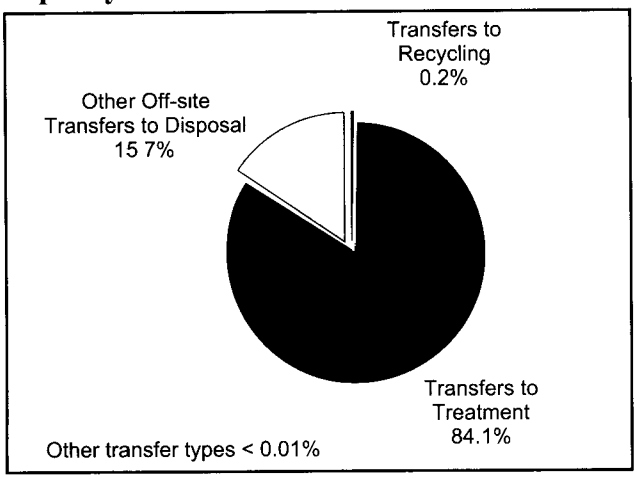
In 2001, facilities in Michigan reported the largest total on- and off-site releases of polychlorinated biphenyls (see Table 3-68). They reported a total of 1.2 million pounds, or 49.9 percent of the total for 2001. Oregon accounted for 672,885 pounds, which was 26.9 percent of the total. The states with the third and fourth largest amounts were Alabama, which reported 200,230 pounds or 8.0 percent of the total, and Utah, which reported 184,759 pounds or 7.4 percent of the total.

Table 3-66: Quantities of TRI Chemicals in Waste, 2001: Polychlorinated Biphenyls

CAS Number	Chemical	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On- and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-production-related Waste Managed Pounds
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

Note: Data are from Section 8 of Form R

Figure 3-15: Distribution of TRI Transfers Off-site for Further Waste Management, including Disposal, 2001: Polychlorinated Biphenyls



Note: Transfers Off-site for Further Waste Management, including Disposal are from Section 6 of Form R

Almost all (over 99.8 percent or 1.2 million pounds) of Michigan's releases of polychlorinated biphenyls were on-site land releases to RCRA subtitle C landfills. The same was true for Oregon and Alabama. Oregon reported 94.6 percent of its total releases as on-site land releases to RCRA subtitle C landfills and Alabama reported 99.9 percent (636,791 pounds and 200,000 pounds, respectively). Almost all of Utah's total releases were other on-site land releases (that is, other than RCRA subtitle C landfills), with 183,565 pounds or 99.4 percent of its total releases.

As shown in Map 3-5, releases of polychlorinated biphenyls are quite concentrated geographically. Four states, Michigan, Oregon, Alabama, and Utah, released over 100,000 pounds. The total releases from these four states represented 92.1 percent of total releases of polychlorinated biphenyls in 2001.

Waste Management Data

Michigan had the largest quantity of polychlorinated biphenyls in production-related waste of any state in 2001 (see Table 3-69). Michigan reported 1.3 million pounds of total production-related waste and accounted for 30.3 percent of the total. Utah ranked second with 1.1 million pounds (27.3 percent of the total).

Over 99 percent of production-related waste in Michigan was released on- or off-site. The 1.3 million pounds released on- or off-site in Michigan accounted for 49.1 percent of all on- or off-site release of polychlorinated biphenyls in 2001. Utah facilities reported 942,270 pounds treated on-site, which was 71.9 percent of the total polychlorinated biphenyls treated on-site in 2001.

TRI Data by Industry

On- and Off-site Releases

The hazardous waste/solvent recovery industries reported the largest total releases of any industry sector, with 2.5 million pounds or 99.5 percent of the total releases on- and off-site of polychlorinated biphenyls in 2001 (see Table 3-70). The hazardous waste/solvent recovery industries also reported the largest amounts of on-site land releases, both releases to RCRA subtitle C landfills and other on-site land releases, with 2.3 million pounds to RCRA subtitle C landfills and 220,048 pounds of other on-site land releases.

Table 3-67: TRI Transfers Off-site for Further Waste Management, including Disposal, 2001: Polychlorinated Biphenyls

CAS Number	Chemical	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs: Metals and Metal Category Compounds Pounds	Transfers to POTWs: Non-metal TRI Chemicals Pounds	Other Off-site Transfers* Pounds	Other Off-site Transfers to Disposal** Pounds	Total Transfers for Further Waste Management, including Disposal Pounds
1336-36-3	Polychlorinated biphenyls (PCBs)	927.79	19.69	316,076 12	0.00	3.08	0.00	58,827.72	375,854 40

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

Table 3-68: TRI On-site and Off-site Releases, by State, 2001: Polychlorinated Biphenyls

		On-site Releases							Off-site Releases	
				Underground Injection		On-site Land Releases				
State	Total Forms	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
Alabama	4	130 33	0 00	0 00	0 00	200,000.00	0 00	200,130 33	100 00	200,230 33
Arizona	1	0 00	0 00	0 00	0 00	0 00	0 00	0 00	726 00	726 00
Arkansas	2	0 25	0.00	0 00	0 00	0 00	0 00	0 25	0 00	0 25
California	7	0 11	0 00	0 00	0 00	16,353 00	3 00	16,356 11	24 02	16,380 12
Connecticut	3	0.00	0 00	0 00	0 00	0 00	0 00	0.00	0 00	0 00
Delaware	1	0 00	0 28	0 00	0 00	0 00	0 32	0 60	71 20	71 80
Florida	3	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 10	0 10
Georgia	2	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
Idaho	1	1 66	0 00	0 00	0.00	6,097.00	0 00	6,098 66	0.00	6,098 66
Illinois	3	0 01	0 00	0 00	0 00	0 00	0 00	0 01	0 49	0 50
Indiana	4	11 17	0 00	0 00	0 00	0 00	2,042 00	2,053 17	0.24	2,053 41
Iowa	3	0 00	0 00	0 00	0 00	0 00	0 00	0 00	47 00	47 00
Kansas	3	146 00	0.28	0 00	0 00	0 00	0.00	146 28	822 24	968.52
Kentucky	5	18 25	0 00	0 00	0 00	0 00	395 45	413 70	0 80	414 50
Louisiana	4	0 00	0 00	0 00	0 00	30 00	0 00	30 00	706 00	736 00
Maine	2	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
Maryland	1	0 00	0 00	0 00	0 00	0 00	0 00	0 00	10 00	10 00
Massachusetts	2	0 00	0 00	0 00	0 00	0 00	0 00	0 00	277 00	277 00
Michigan	5	95 00	0 00	0 00	0 00	1,247,638 00	0 00	1,247,733 00	1,974 14	1,249,707 14
Minnesota	2	0 00	0 00	0 00	0 00	0 00	0 00	0 00	1,295 21	1,295 21
Mississippi	2	0.00	0 00	0 00	0.00	0 00	163 70	163.70	0 00	163 70
Missouri	1	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
Nebraska	1	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0.00
Nevada	2	0 00	0 00	0 00	0 00	88,326 00	0 00	88,326 00	0 00	88,326 00
New Jersey	3	0 61	0 00	0 00	0 00	0.00	0 00	0 61	20 53	21 14
New York	7	235 40	0 24	0 00	0 00	0 00	1,600 00	1,835 64	3,689 86	5,525 50
North Carolina	10	647 10	0 00	0 00	0 00	0 00	0 00	647 10	0 00	647 10
Ohio	8	0 00	0 00	0 00	0 00	51 00	0 00	51 00	460 60	511 60
Oklahoma	2	20 00	0 00	0 00	0 00	69,557 00	0.00	69,577.00	0 00	69,577.00
Oregon	4	0 00	0 00	0 00	0 00	636,791 30	36,093 38	672,884 68	0 00	672,884 68
Pennsylvania	7	17 32	0 00	0 00	0 00	0 00	0 00	17 32	156 00	173.32
Puerto Rico	2	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
Rhode Island	1	0 00	0 00	0.00	0 00	0 00	0 00	0 00	0 83	0 83
South Carolina	4	21 01	0 00	0 00	0 00	0 00	0 00	21 01	0 00	21 01
South Dakota	1	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0.00
Tennessee	5	1 24	0 00	0 00	0 00	0 00	1,823 00	1,824 24	275 63	2,099 87
Texas	9	7 05	2 00	0 00	0 00	616 00	0 00	625.05	46 33	671.38
Utah	3	4 00	0 00	0 00	0 00	17 00	183,565 00	183,586 00	1,173 10	184,759 10
Virginia	2	1 24	0 00	0 00	0 00	0 00	0 00	1 24	294 70	295.94
Washington	1	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
West Virginia	1	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
Wisconsin	3	2 15	0 00	0 00	0 00	0 00	0 00	2 15	79 00	81 15
Total	**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**

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

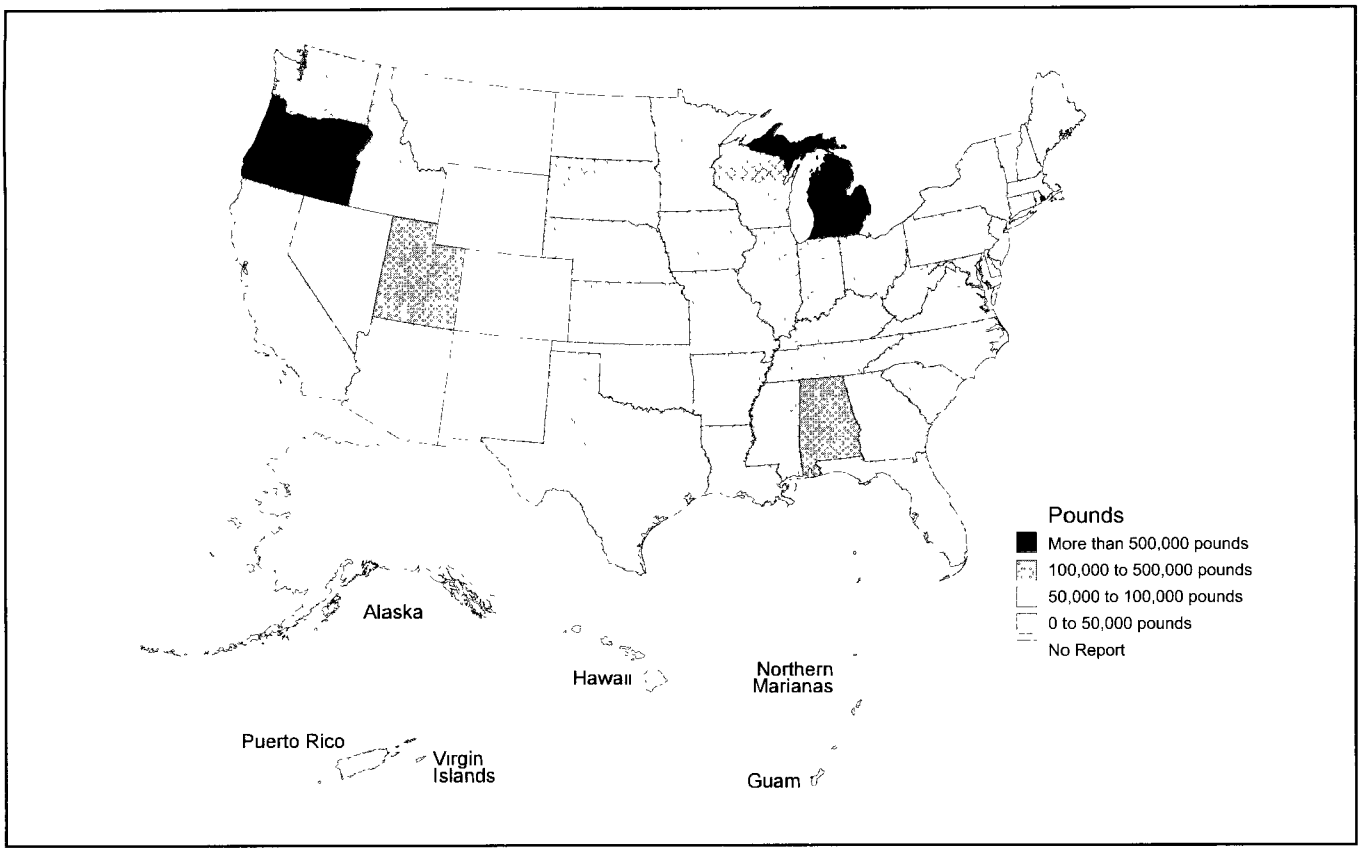
The primary metals industry had the second largest total releases, with 9,061 pounds of total releases, 63.5 percent of which were off-site releases (transfers off-site to disposal). These transfers off-site to disposal of 5,751 pounds were the largest amount of polychlorinated biphenyls in 2001 released off-site for any industry.

The machinery industry reported the third largest total releases of polychlorinated biphenyls in 2001, with 2,042 pounds of total releases, all of which were other on-site land releases (that is, other than RCRA subtitle C landfills). The electric utilities industry reported the largest amount of air emissions, with 685 pounds.

Waste Management

The hazardous waste/solvent recovery industries reported the largest amount of polychlorinated biphenyls in production-related waste in 2001 (see Table 3-71). With 4.1 million pounds of polychlorinated biphenyls in production-related waste, the

Map 3-5: Total On- and Off-site Releases, 2001: Polychlorinated Biphenyls



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

hazardous waste/solvent recovery industries accounted for 98.6 percent of the polychlorinated biphenyls in waste. A total of 2.5 million pounds of polychlorinated biphenyls were released on- or off-site by the hazardous waste/solvent recovery industries. These 2.5 million pounds represented 62.3 percent of these industries' polychlorinated biphenyls in production-related waste. The hazardous waste/solvent recovery industries also treated on-site 1.3 million pounds, which was 31.8 percent of its total production-related waste.

The chemical manufacturing industry reported the second largest amount of polychlorinated biphenyls in production-related waste in 2001, with a total of 36,664 pounds. This was less than one percent of total production-related waste of polychlorinated biphenyls in 2001. More than half (55.4 percent or 20,294 pounds) of the chemical industry's polychlorinated biphenyls in production-related waste was treated off-site, more than one-third (40.5 percent or 14,841 pounds) was treated on-site and 3.3 percent or 1,217 pounds were released on- and off-site.

The primary metals industry reported the third largest amount of polychlorinated biphenyls in production-related waste of polychlorinated biphenyls in 2001, with a total of 10,475 pounds, with 6,202 pounds (59.2 percent of its polychlorinated biphenyls in production-related waste) treated off-site and 4,208 pounds (40.2 percent) released on- and off-site.

Table 3-69: Quantities of TRI Chemicals in Waste, by State, 2001: Polychlorinated Biphenyls

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	0.00	0 00	0.00	0.00	0.00	81,021.00	200,261.50	281,282 50	0.00
Arizona	0 00	0 00	0 00	0 00	0 00	25,745 40	726 00	26,471 40	0 00
Arkansas	0.00	0.00	0.00	0 00	0.00	2 04	12.80	14.84	0.00
California	355 10	36 08	0.00	0 00	0 00	26,325 00	16,763.03	43,479 21	0 00
Connecticut	0 00	0.00	0.00	0.00	14 41	0 00	0.00	14.41	0.00
Delaware	0 00	0.00	0 00	0 00	0 00	0 00	71 80	71 80	0 00
Florida	0.00	0 10	0 50	0.00	0.00	2.80	0 10	3.50	2.80
Georgia	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
Idaho	0.00	0.00	0.00	0 00	0.00	0.00	6,097.00	6,097 00	0.00
Illinois	0 00	0 00	0 00	0 00	98 00	190 00	0 50	288 50	0 00
Indiana	0.00	0 00	0 00	0.00	1.99	2,042.00	2,172 20	4,216.19	2,042.00
Iowa	0 00	26 70	0 00	0 00	29 00	0 00	47 00	102 70	213 00
Kansas	0.00	0 00	0.00	0 00	0.00	26,333.00	45,932 00	72,265 00	0.00
Kentucky	0 00	0 00	0 00	0 00	773 00	656 00	414 50	1,843 50	0 00
Louisiana	0 00	0.00	0 00	0.00	14,585.00	167 97	737.00	15,489.97	115 76
Maine	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
Maryland	0 00	0 00	0.00	0 00	0 00	10 00	0.00	10 00	0.00
Massachusetts	0 00	0 00	0 00	0 00	0 00	83,594 00	277 00	83,871 00	0 00
Michigan	0.00	6 00	0.00	18 00	850 90	21 68	1,250,115.17	1,251,011.75	0.00
Minnesota	0 00	0 00	0 00	0 00	0 00	0 15	1,066 21	1,066 36	229 00
Mississippi	0 00	0 00	0.00	0.00	0.00	0.00	163 70	163.70	0 00
Missouri	0 00	0 00	15 00	0 00	0 00	0 00	0 00	15 00	0 00
Nebraska	0 00	0 00	0.00	0 00	1,438 00	0.00	0 00	1,438 00	0 00
Nevada	0 00	0 00	0 00	36 40	0 00	212 00	88,326 00	88,574 40	0 00
New Jersey	0 00	0.00	0.00	0.00	45.00	0.00	21 94	66 94	0 00
New York	0 00	0 00	0 00	0 00	0 00	89 24	264.46	353 70	20,200 00
North Carolina	0.00	0 00	25.10	0 00	0 00	254 02	648 00	927 12	0 00
Ohio	0.00	0 00	0 00	0.00	136 00	54 10	104 10	294 20	400 00
Oklahoma	0 00	0 00	0.00	0 00	0.00	0.00	69,577 00	69,577.00	0.00
Oregon	0 00	0 00	0 00	0 00	0 00	3,565 60	672,884 50	676,450 10	0 03
Pennsylvania	0 00	53.00	15 40	0.00	0 00	390.00	188 95	647 35	0 00
Puerto Rico	0 00	0 00	0 00	0 00	0 00	468 00	0 00	468 00	0 00
Rhode Island	0 00	0.00	0 00	0.00	0.00	0.00	0 83	0.83	0.00
South Carolina	0 00	0 00	0 00	0 00	0 00	0 00	21 01	21 01	0 00
South Dakota	0.00	0 00	0 00	0.00	0 00	0.00	0 00	0 00	0.00
Tennessee	0 00	0 00	0 00	0 00	26,521 00	18,879 00	2,159 60	47,559 60	0 00
Texas	0 00	0.00	312.00	0.00	323,973.00	281.30	1,217.23	325,783 53	0.00
Utah	0 00	0 00	0 00	0 00	942,270 00	2 00	184,759 10	1,127,031 10	0 00
Virginia	0 00	0.00	0 00	0 00	0.00	0.00	295.94	295.94	0.00
Washington	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
West Virginia	0.00	0.00	0 00	0.00	0 00	436.00	0 00	436.00	0.00
Wisconsin	0 00	0 00	32 00	0 00	0 00	25 00	81 15	138 15	0 00
Total	**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**

Note: Data are from Section 8 of Form R

Projected Quantities of TRI Chemicals Managed in Waste, 2001-2003

TRI facilities expected to decrease the quantity of polychlorinated biphenyls in production-related waste between 2001 and 2003 by 11.0 percent, from 4.1 million pounds to 3.7 million pounds (see Table 3-72). The decrease was projected to occur in the amount released on- and off-site, which was expected to decrease by 17.8 percent. 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). The projected decrease from 2001 to 2002 was 4.0 percent (from 4.1 million pounds to 4.0 million pounds), and the projected decrease from 2002 to 2003 was 7.3 percent.

The actual change from the prior year of 2000, to 2001 was a decrease of 63.3 percent, from 11.2 million pounds to 4.1 million pounds.

Source Reduction

In 2001, 13 forms were filed reporting source reduction activities for polychlorinated biphenyls (see Table 3-73). As noted in **Waste Management** in Chapter 1, source reduction—an activity that pre-

Table 3-70: TRI On-site and Off-site Releases, by Industry, 2001: Polychlorinated Biphenyls

			On-site Releases							Off-site Releases	
					Underground Injection		On-site Land Releases				
SIC Code	Industry	Total Forms	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
20	Food	1	0 00	0.00	0 00	0.00	0 00	0 00	0 00	0 00	0 00
22	Textiles	2	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
24	Lumber	1	0 00	0.00	0.00	0 00	0.00	0 00	0 00	0.00	0 00
26	Paper	11	0 00	0 00	0 00	0 00	0 00	0 00	0 00	138 15	138 15
28	Chemicals	32	18 06	2.28	0 00	0.00	0 00	311 02	331 36	770 79	1,102 15
29	Petroleum	3	0 10	0 00	0 00	0 00	0 00	0 00	0 10	0 00	0 10
32	Stone/Clay/Glass	2	226.00	0.00	0.00	0.00	0 00	0.00	226.00	0 00	226 00
33	Primary Metals	20	24 41	0 24	0 00	0 00	0 00	3,285 00	3,309 65	5,751 03	9,060 68
35	Machinery	2	0 00	0 00	0.00	0.00	0.00	2,042 00	2,042.00	0 00	2,042 00
36	Electrical Equip	1	0 00	0 00	0 00	0 00	0 00	0 00	0 00	61 00	61 00
37	Transportation Equip.	1	0 00	0 00	0.00	0.00	0.00	0 00	0 00	100 00	100 00
38	Measure/Photo	1	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
39	Miscellaneous	2	0 00	0.00	0.00	0.00	0 00	0 00	0 00	0 00	0 00
--	Multiple codes 20-39	4	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
--	No codes 20-39	4	0.00	0 00	0.00	0.00	0 00	0 00	0 00	0 00	0 00
491/493	Electric Utilities	18	685 11	0 00	0 00	0 00	0 00	0 00	685 11	0 12	685 22
5171	Petroleum Terminals/Bulk Storage	4	2 15	0.00	0.00	0.00	0.00	0 00	2 15	0 67	2.82
7389/4953	Hazardous Waste/Solvent Recovery	28	404 07	0 28	0 00	0 00	2,265,476 30	220,047 83	2,485,928 48	5,429 26	2,491,357 74
	Total	**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**

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

vents the generation of waste—is preferred to waste management. These 13 forms represented 9.5 percent of all forms submitted for polychlorinated biphenyls in 2001.

The most frequently reported source reduction activities were spill and leak prevention and raw materials modifications, each listed on 4 forms.

On- and Off-site Releases, 2000-2001

On- and off-site releases of polychlorinated biphenyls increased from 1.4 million pounds to 2.5 million pounds from 2000 to 2001, an increase of 73.6 percent (see Table 3-74). This was due to an increase in on-site land releases, which increased by 1.1 million pounds or 74.0 percent. Releases to

Table 3-71: Quantities of TRI Chemicals in Waste, by Industry, 2001: Polychlorinated Biphenyls

		Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Wast Managed	Non-production-related Waste Managed
SIC Code	Industry	On-site	Off-site	On-site	Off-site	On-site	Off-site			
		Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
20	Food	0 00	0.00	0.00	0.00	0.00	0.00	0.00	0 00	0 00
22	Textiles	0 00	0 00	0 00	0.00	0 00	0 00	0 00	0 00	0 00
24	Lumber	0.00	0.00	0.00	0.00	0.00	3,427.00	0 00	3,427.00	0.00
26	Paper	0 00	0 00	32 00	0 00	0 00	25 32	138 98	196 30	0 00
28	Chemicals	0 00	0 00	312.00	0.00	14,841.41	20,293.78	1,216.60	36,663.79	515.76
29	Petroleum	355 10	24 00	0 00	0 00	0 00	44 20	0 01	423 31	0 00
32	Stone/Clay/Glass	0.00	0.00	15.40	0 00	0.00	0.00	226.00	241.40	0 00
33	Primary Metals	0 00	0 00	0 00	36 40	29 00	6,202 37	4,207 53	10,475 30	20,642 00
35	Machinery	0 00	0.00	0.00	0.00	0 00	2,042 00	2,042.00	4,084.00	2,042 00
36	Electrical Equip	0 00	0 00	0 00	0 00	0 00	61 00	0 00	61 00	0 00
37	Transportation Equip.	0.00	0.00	0 00	0.00	0 00	121 00	121.00	242.00	0 00
38	Measure/Photo	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
39	Miscellaneous	0 00	26.70	0 00	0 00	0 00	0 00	0.00	26 70	0 00
--	Multiple codes 20-39	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
--	No codes 20-39	0.00	0 00	0.00	0 00	0.00	264.02	0.00	264 02	0 00
491/493	Electric Utilities	0 00	65 18	40 60	0 00	12 90	2 80	686 12	807 60	2 80
5171	Petroleum Terminals/Bulk Storage	0 00	0.00	0 00	0 00	1.99	12.90	15.48	30.37	0 00
7389/4953	Hazardous Waste/Solvent Recovery	0 00	6 00	0 00	18 00	1,295,850 00	238,270 91	2,536,753 60	4,070,898 51	0 03
	Total	**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**

Note: Data are from Section 8 of Form R

Table 3-72: Prior Year, Current Year and Projected Quantities of TRI Chemicals in Waste, 2000-2003: Polychlorinated Biphenyls

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	358 00	0 0	355.10	0.0	360.00	0.0	360.00	0 0
Recycled Off-site	141 30	0 0	121 88	0 0	90 20	0 0	90 20	0 0
Energy Recovery On-site	1,410.77	0.0	400 00	0 0	388 70	0 0	388.90	0 0
Energy Recovery Off-site	17 00	0 0	54 40	0 0	25 43	0 0	25 43	0 0
Treated On-site	10,085,373 28	89.8	1,310,735 30	31.8	1,302,814 88	32.9	1,302,854.88	35.5
Treated Off-site	264,209 63	2 4	270,767 30	6 6	279,543 90	7 1	277,170 29	7 5
Quantity Released On- and Off-site	881,985 35	7 9	2,545,407 33	61 7	2,380,342 58	60 1	2,091,882 36	57 0
Total Production-related Waste Managed	**11,233,495.33**	**100.0**	**4,127,841.31**	**100.0**	**3,963,565.69**	**100.0**	**3,672,772.06**	**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	-0 8	1.4	0 0	1.4
Recycled Off-site	-13 7	-26 0	0 0	-26 0
Energy Recovery On-site	-71.6	-2 8	0 1	-2.8
Energy Recovery Off-site	220 0	-53 3	0 0	-53 3
Treated On-site	-87 0	-0 6	0 0	-0.6
Treated Off-site	2 5	3 2	-0 8	2 4
Quantity Released On- and Off-site	188 6	-6.5	-12 1	-17.8
Total Production-related Waste Managed	**-63.3**	**-4.0**	**-7.3**	**-11.0**

Note: Data from Section 8 of Form R for 2001

RCRA subtitle C landfills increased by 891,282 pounds and to other on-site landfills by 168,142 pounds.

On-site air releases of polychlorinated biphenyls also increased from 2000 to 2001, by 202 pounds or 17.4 percent. Other on-site releases, including surface water discharges and underground injection, decreased.

Off-site releases (transfers to disposal) of polychlorinated biphenyls increased from 2000 to 2001. The increase was 2,045 pounds or 20.0 percent. Transfers to landfills/surface impoundments increased by 6,064 pounds, from 4,370 pounds in 2000 to 10,434 pounds in 2001. Not all types of transfers to disposal showed increases, however. Transfers to waste brokers for disposal showed decreases overall, of 4,419 pounds, or 86.7 percent.

Waste Management Data, 2000-2001

Quantities of TRI Chemicals in Waste, 2000-2001

Polychlorinated biphenyls in production-related waste decreased from 13.8 million pounds in 2000 to 4.1 million pounds in 2001, a decrease of 70.1 percent (see Table 3-75). The amount treated on-site decreased by 10.6 million pounds or 89.0 percent. The amount treated off-site also decreased, by 144,396 pounds or 34.8 percent.

However, the quantity of polychlorinated biphenyls released on- and off-site increased by 1.1 million pounds or 71.6 percent from 2000 to 2001.

Table 3-73: Number of Forms Reporting Source Reduction Activity, by Category, 2001: Polychlorinated Biphenyls

CAS Number	Chemical	Total Form Rs Number	Forms Reporting Source Reduction Activity: Number	Forms Reporting Source Reduction Activity: Percent of All Form Rs Percent	Category of Source Reduction Activity: Good Operating Practices Number	Inventory Control Number	Spill and Leak Prevention Number	Raw Materials Modifications Number	Process Modifications Number	Cleaning and Degreasing Number	Surface Preparation and Finishing Number	Product Modifications Number
1336-36-3	Polychlorinated biphenyls (PCBs)	137	13	9 5	2	1	4	4	2	0	0	0

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

Table 3-74: TRI On-site and Off-site Releases, 2000-2001: Polychlorinated Biphenyls

	2000	2001	Change 2000-2001	
	Number	Number	Number	Percent
Forms	162	137	-25	-15 4
	Pounds	Pounds	Pounds	Percent
Total Air Emissions	1,158.00	1,359.90	201.89	17.4
Surface Water Discharges	28.82	2.80	-26.02	-90.3
Underground Injection	0.60	0.00	-0.60	-100.0
Class I Wells	0.60	0.00	-0 60	-100.0
Class II-V Wells	0.00	0.00	0.00	--
On-site Land Releases	1,431,738 80	2,491,162.15	1,059,423 35	74.0
RCRA Subtitle C Landfills	1,374,194.80	2,265,476.30	891,281.50	64.9
Other On-site Land Releases	57,544.00	225,685 85	168,141 85	292.2
Total On-site Releases	**1,432,926.22**	**2,492,524.85**	**1,059,598.63**	**73.9**
Off-site Releases				
Storage Only*	386.30	10.00	-376.30	-97.4
Solidification/Stabilization**	0 00	0 00	0 00	--
Metals and Metal Category Compounds Only				
Wastewater Treatment (Excluding POTWs)***	0 00	0.00	0 00	--
Metals and Metal Category Compounds Only				
Transfers to POTWs****	0 00	0 00	0 00	--
Metals and Metal Category Compounds Only				
Underground Injection	0 00	4 00	4.00	--
Landfills/Surface Impoundments	4,369.55	10,433 85	6,064.30	138.8
Land Treatment	0.00	0 00	0 00	--
Other Land Disposal	75 90	127.60	51.70	68.1
Other Off-site Management	188 41	174 74	-13 67	-7.3
Transfers to Waste Broker for Disposal	5,097.11	678.34	-4,418.77	-86.7
Unknown*****	88 33	822 49	734.16	831 2
Total Off-site Releases (Transfers Off-site to Disposal)	**10,205.60**	**12,251.02**	**2,045.42**	**20.0**
Total On- and Off-site Releases	**1,443,131.82**	**2,504,775.86**	**1,061,644.04**	**73.6**

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 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)

Table 3-75: Quantities of TRI Chemicals in Waste by Waste Management Activity, 2000-2001: Polychlorinated Biphenyls

Waste Management Activity	2000	2001	Change 2000-2001	
	Pounds	Pounds	Pounds	Percent
Recycled On-site	358.00	355.10	-2.90	-0 8
Recycled Off-site	611.65	121.88	-489 77	-80 1
Energy Recovery On-site	1,410.77	400.00	-1,010 77	-71.6
Energy Recovery Off-site	10,517 00	54 40	-10,462.60	-99 5
Treated On-site	11,906,010.11	1,310,735.30	-10,595,274 81	-89.0
Treated Off-site	415,163 21	270,767 30	-144,395 91	-34 8
Quantity Released On- and Off-site	1,483,299 33	2,545,407.33	1,062,107.99	71.6
Total Production-related Waste Managed	**13,817,370.07**	**4,127,841.31**	**-9,689,528.77**	**-70.1**
Non-production-related Waste Managed	22,247.24	23,202.59	955.35	4 3

Note: Data are from Section 8 of Form R of year indicated

Table 3-76: TRI Transfers Off-site for Further Waste Management, including Disposal, 2000-2001: Polychlorinated Biphenyls

	2000	2001	Change 2000-2001	
	Pounds	Pounds	Pounds	Percent
Transfers to Recycling	765.22	927.79	162.57	21.2
Transfers to Energy Recovery	10,481.15	19.69	-10,461.46	-99 8
Transfers to Treatment	408,787.25	316,076.12	-92,711.13	-22.7
Transfers to POTWs	224.71	3 08	-221 63	-98.6
Metals and Metal Category Compounds Only	0.00	0.00	0.00	--
Non-metal TRI Chemicals	224 71	3 08	-221 63	-98 6
Other Off-site Transfers*	0.00	0.00	0.00	--
Other Off-site Transfers to Disposal**	34,528.32	58,827 72	24,299.40	70.4
Total Transfers for Further Waste Management, including Disposal	**454,786.65**	**375,854.40**	**-78,932.25**	**-17.4**

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

Much smaller amounts of polychlorinated biphenyls were reported as recycled or in waste burned for energy recovery and the amounts decreased from 2000 to 2001 in these categories.

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

As shown in Table 3-76, total transfers off-site for further waste management, including disposal, of polychlorinated biphenyls decreased from 2000 to 2001, by 78,932 pounds or 17.4 percent. Transfers to treatment decreased by 92,711 pounds or 22.7 percent. Polychlorinated biphenyls in waste sent for energy recovery also decreased, by 10,461 pounds or 99.8 percent.

Increases were reported in the amount of polychlorinated biphenyls in other off-site transfers to disposal. Such transfers increased by 24,299 pounds or 70.4 percent.

Pesticides

INTRODUCTION

This section contains a discussion of the pesticides that have been classified as PBT chemicals: aldrin, chlordane, heptachlor, isodrin, methoxychlor, pendimethalin, toxaphene, and trifluralin.

Aldrin is an organochlorine compound first introduced to the U.S. in 1950 as a cotton pesticide. Pure aldrin is a white powder with a mild chemical odor. The less pure commercial powders have a tan color. Aldrin does not occur naturally in the environment. It was used as an insecticide from the 1950s to early 1970s on cotton and corn crops. In 1974, all uses except termite control were canceled under FIFRA[1] and production in the United States ceased. Aldrin has not been imported since 1985 due to health concerns and insect resistance.

Chlordane is an organochlorine compound used as a general pesticide. Pure chlordane is a white crystalline solid with a mild, pungent odor. It was first marketed in 1948 in a variety of formulations. Chlordane was once widely used as an insecticide on corn, citrus, and home gardens and as a fumigant in termite and carpenter ant control. Concern over the health effects and particularly the carcinogenicity of chlordane lead to an eventual ban on all domestic uses of chlordane in 1988.

Heptachlor is an organochlorine insecticide produced by the chlorination of chlordane. Technical heptachlor contains 20 percent chlordane and is a mixture of heptachlor and many related chemicals. Heptachlor does not occur naturally in the environment. It is a white powder that smells like mothballs. Heptachlor was first registered in the U.S. in 1952 for use as a general insecticide on a wide range of agricultural crops. Heptachlor was also used for home and garden insect control, for termite control, and as a seed treatment. In 1974, EPA issued a Notice of Intent to Cancel all registered uses of heptachlor except those for subterranean termite control and dipping of non-food plants. In March 1978, most other uses of heptachlor were canceled. Its use is now severely restricted and is presently only used in the U.S. to control fire ants in buried, pad-mounted electric power transformers and in underground cable television and telephone cable boxes.

Isodrin is an insecticide which is no longer used or manufactured in the U.S. Isodrin is a white crystalline solid. Isodrin is made from the slow reaction of cyclopentadiene with the condensation product of vinyl chloride and hexachlorocyclopentadiene.

Methoxychlor is an organochlorine used as a general insecticide. It is a pale-yellow powder with a slightly fruity or musty odor. However, it is available in many forms, including powders, emulsifiable concentrates, granules, and an aerosol. Methoxychlor is similar in structure to dichlorodiphenyltrichloroethane (DDT), but it is less toxic. Methoxychlor is used on agricultural crops, livestock, grain storage, home gardens, and pets. EPA has approved the use of methoxychlor as a pesticide and fumigant on more than 85 crops such as fruits, vegetables, forage crops, and shade trees. It may also be applied to large areas such as beaches, estuaries, and marshes for control of flies and mosquito larvae and may be used for spray treatment of barns, grain bins, mushroom houses, other agricultural premises, and garbage and sewage areas.

Pendimethalin is used as an insecticide and herbicide. It is also known as benzenamine. Pendimethalin was first registered as a pesticide in 1972 and marketed in 1976. Pendimethalin is an orange-yellow crystalline solid and is formulated as a liquid, solid, granular, and an emulsifiable concentrate. It is used as a pre-emergence and post-emergence herbicide on cotton, dry bulbs, onions, dry bulb shallots, edible beans, corn, legumes, garlic, grain, nonbearing fruit, nut crops, peanuts, pota-

[1]FIFRA Federal Insecticide, Fungicide, and Rodenticide Act

toes, rice, soybeans, sugar cane, sunflowers, sweet corn, and sweet lupine. It is also used for pre-emergence control of many annual grasses and certain broadleaf weeds. Pendimethalin is applied by broadcasting, directed spray, and soil treatment.

Toxaphene is a polychlorinated camphene, which was widely used as an insecticide in the U.S. until 1990. Toxaphene is a man-made mixture containing more than 670 chemicals. It is a yellow or amber, waxy solid that smells like turpentine. Toxaphene is an insecticide that was primarily used in the southern U.S. to control pests on cotton, vegetables, livestock and poultry, soybeans, and alfalfa, wheat, and sorghum. Other uses included controlling unwanted fish growth in lakes and pests on livestock. All registered uses of toxaphene in the U.S. were canceled in 1990. It is still commonly used as an insecticide on bananas and pineapples in Puerto Rico and the Virgin Islands.

Trifluralin is an herbicide used primarily on cotton and soybean crops. Trifluralin is a yellow-orange crystalline solid. Production of trifluralin has declined since restrictions on product formulation were implemented in 1982 due to carcinogenicity and mutagenicity concerns. It is used on soybean crops, cotton, wheat, alfalfa, sunflowers and many other crops.

More details on these pesticides, their sources, chemical characteristics, health and environmental effects and efforts being undertaken to reduce pollution from the pesticides can be found in the *2000 Toxics Release Inventory Public Data Release Report* (EPA 260-R-02-003).

2001 TRI DATA FOR PESTICIDES

On-site and Off-site Releases, 2001

As shown in Table 3-77, there were 130 TRI forms submitted for the group of eight pesticides subject to the lower reporting thresholds for PBT chemicals for 2001. On- and off-site releases for these pesticides totaled 111,262 pounds.

Pendimethalin had the largest releases of this group, with 79,488 pounds or 71.4 percent of the total releases of the eight pesticides. Trifluralin had the second largest releases, with 22,516 pounds or 20.2 percent of the total releases.

Off-site releases (transfers to disposal) were the largest type of release for the group of pesticides, accounting for 45.7 percent of total releases or 50,845 pounds (see Figure 3-16). The second largest release type was other on-site land releases (that is, other than RCRA subtitle C landfills), which accounted for 34.4 percent or 38,278 pounds. (Types of on-site land releases are described in Box 1-4 in Chapter 1.)

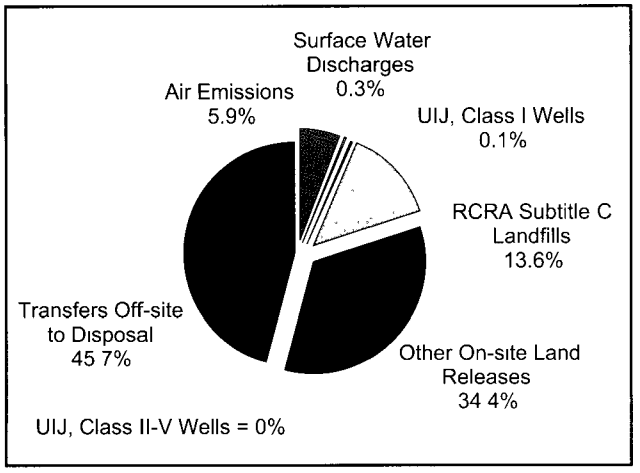
On-site releases to RCRA subtitle C landfills totaled 15,183 pounds or 13.6 percent and air emissions were 6,560 pounds or 5.9 percent. Surface water discharges and underground injection of these pesticides totaled 397 pounds.

Table 3-77: TRI On-site and Off-site Releases, 2001: Pesticides

			On-site Releases							Off-site	
					Underground Injection		On-site Land Releases			Releases	Total
CAS Number	Chemical	Total Forms	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	On- and Off-site Releases
		Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
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
	Total	**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**

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

Figure 3-16: Distribution of TRI On-site and Off-site Releases, 2001: Pesticides



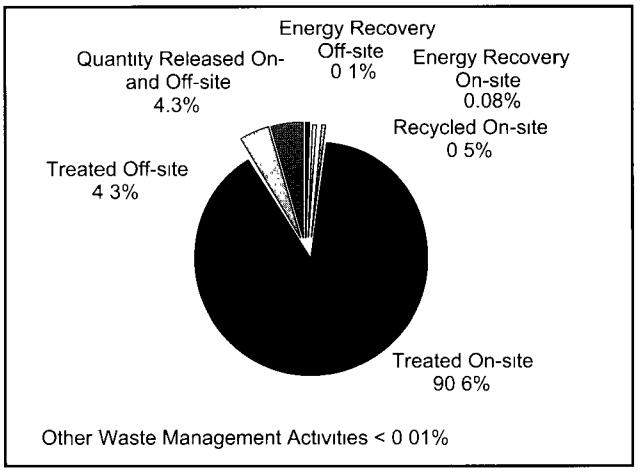
Note: On-site Releases are from Section 5 of Form R **Off-site Releases** are from Section 6 (transfers off-site to disposal) of Form R **Off-site Releases** include metals and metal category compounds transferred off-site for solidification/stabilization and for wastewater treatment, including to POTWs **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

Trifluralin had the largest on-site land releases to RCRA subtitle C landfills, with 7,668 pounds which was one-half of the releases to RCRA subtitle C landfills reported for all eight pesticides in 2001.

Pendimethalin had the largest other on-site land releases, with 28,832 pounds or 75.3 percent of the total of such releases for the eight pesticides, the largest off-site releases (transfers to disposal) with 46,702 pounds or 91.9 percent of the total off-site releases, and the largest air emissions, with 3,574 pounds or 54.5 percent of the total air releases of the pesticides in 2001.

Figure 3-17: Distribution of Quantities of TRI Chemicals in Waste, 2001: Pesticides



Note: Data are from Section 8 of Form R

Waste Management Data, 2001

Quantities of TRI Chemicals in Waste

The quantity of pesticides in production-related waste totaled 2.7 million pounds in 2001, as shown in Table 3-78. Most (2.4 million pounds or 90.6 percent) of the quantity in production-related waste was treated on-site (see Figure 3-17). Another 4.3 percent (115,494 pounds) was released on- and off-site and 4.3 percent (115,391 pounds) was treated off-site. Other types of waste management totaled less than one percent.

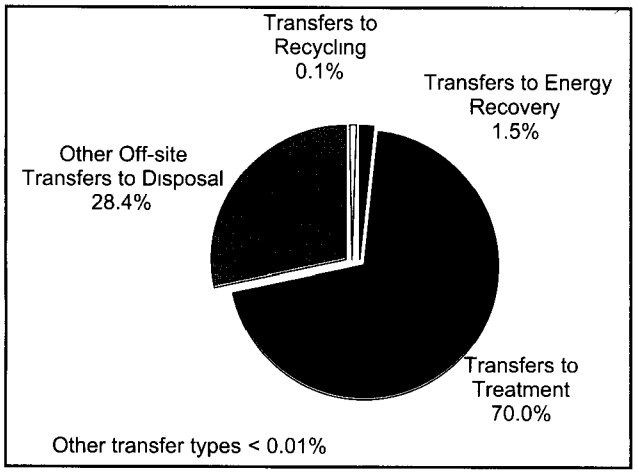
The chemical heptachlor had the largest production-related waste, accounting for 28.3 percent (752,719 pounds) of production-related waste for all eight pesticides. Most of the heptachlor in production-related waste was treated on-site. The 751,862 pounds of heptachlor treated on-site represented

Table 3-78: Quantities of TRI Chemicals in Waste, 2001: Pesticides

CAS Number	Chemical	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On- and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-production-related Waste Managed Pounds
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
	Total	**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**

Note: Data are from Section 8 of Form R

Figure 3-18: Distribution of TRI Transfers Off-site for Further Waste Management, including Disposal, 2001: Pesticides



Note: Transfers Off-site for Further Waste Management, including Disposal are from Section 6 of Form R

99.9 percent of total production-related waste of heptachlor in 2001.

The chemical pendimethalin accounted for 503,199 pounds or 18.9 percent of the total of this group of pesticides in production-related waste. Pendimethalin also accounted for the largest quantity released on- or off-site, with 71,546 pounds or 61.9 percent of the total amount released on- or off-site.

The chemical chlordane accounted for 17.6 percent or 468,565 pounds of the pesticide chemicals in production-related waste, most of which was treated on-site. Trifluralin accounted for 408,075 pounds (15.3 percent of the total).

Transfers Off-site for Further Waste Management, including Disposal

Transfers off-site for further waste management, including disposal, of this group of eight pesticides totaled almost 181,969 pounds in 2001 (see Table 3-79). Transfers to treatment accounted for 70.0 percent of the total transfers for further waste management, including disposal, of the pesticides in 2001 (see Figure 3-18). Transfers to treatment were 127,371 pounds. Other transfers to disposal were 51,760 pounds or 28.4 percent of total transfers for further waste management, including disposal, of these pesticides for 2001. Other types of transfers were about 2,838 pounds.

The chemical trifluralin accounted for 46.0 percent (83,676 pounds) of total transfers for further waste management, including disposal, of these pesticides for 2001. Most (95.6 percent or 79,974 pounds) of this was transferred to treatment.

Pendimethalin accounted for 44.7 percent or 81,358 pounds of total transfers for further waste management, including disposal. A total of 57.4 percent of it (46,702 pounds) was transferred to disposal and 42.6 percent (34,656 pounds) to treatment.

Table 3-79: TRI Transfers Off-site for Further Waste Management, including Disposal, 2001: Pesticides

CAS Number	Chemical	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs: Metals and Metal Category Compounds Pounds	Transfers to POTWs: Non-metal TRI Chemicals Pounds	Other Off-site Transfers* Pounds	Other Off-site Transfers to Disposal** Pounds	Total Transfers for Further Waste Management, including Disposal Pounds
309-00-2	Aldrin	0 00	306 00	11 00	0.00	0 00	0 00	1.07	318 07
57-74-9	Chlordane	0 00	0 00	425.00	0 00	0 00	0 00	331 61	756 61
76-44-8	Heptachlor	8 00	334 00	116 00	0 00	0 00	0 00	28 24	486 24
465-73-6	Isodrin	2 00	0 00	142 00	0 00	0 00	0 00	443 63	587 63
72-43-5	Methoxychlor	0 00	1,376.00	11,846.00	0 00	0 00	0 00	95.93	13,317.93
40487-42-1	Pendimethalin	0 00	0 00	34,656 00	0 00	0 00	0 00	46,702 21	81,358 21
8001-35-2	Toxaphene	169 00	7 15	200 82	0 00	1 00	0 00	1,090 14	1,468 11
1582-09-8	Trifluralin	0 00	625 00	79,974 00	0 00	10 00	0 00	3,067 11	83,676 11
	Total	**179.00**	**2,648.15**	**127,370.82**	**0.00**	**11.00**	**0.00**	**51,759.94**	**181,968.91**

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

TRI Data by State

Facilities in Ohio, with 18 forms, and Texas, with 11 forms, submitted the largest number of forms in 2001 for the group of eight PBT chemical pesticides. All other states had 10 or fewer forms submitted.

On- and Off-site Releases

In 2001, facilities in Florida reported the largest total on- and off-site releases of these pesticides (see Table 3-80), a total of 62,875 pounds, or 56.5 percent of the total for 2001.

Georgia reported the second largest total releases, with 10,429 pounds representing 9.4 percent of total releases of this group of pesticides. Kansas reported the third largest amount with 9,580 pounds, which was 8.6 percent of the total.

Most of Florida's releases of these pesticides were off-site releases (transfers to disposal). The 40,724 pounds of such releases in Florida represented 80.1 percent of the total of off-site releases for this group of pesticides. Florida also accounted for the largest amount of other on-site land releases (that is, other than RCRA subtitle C landfills) with 20,889 pounds, or 54.6 percent of the total amount of other on-site land releases.

As shown in Map 3-6, two states, Florida and Georgia, each released over 10,000 pounds of the eight PBT chemical pesticides in 2001. Nine other states each released over 1,000 pounds.

Waste Management Data

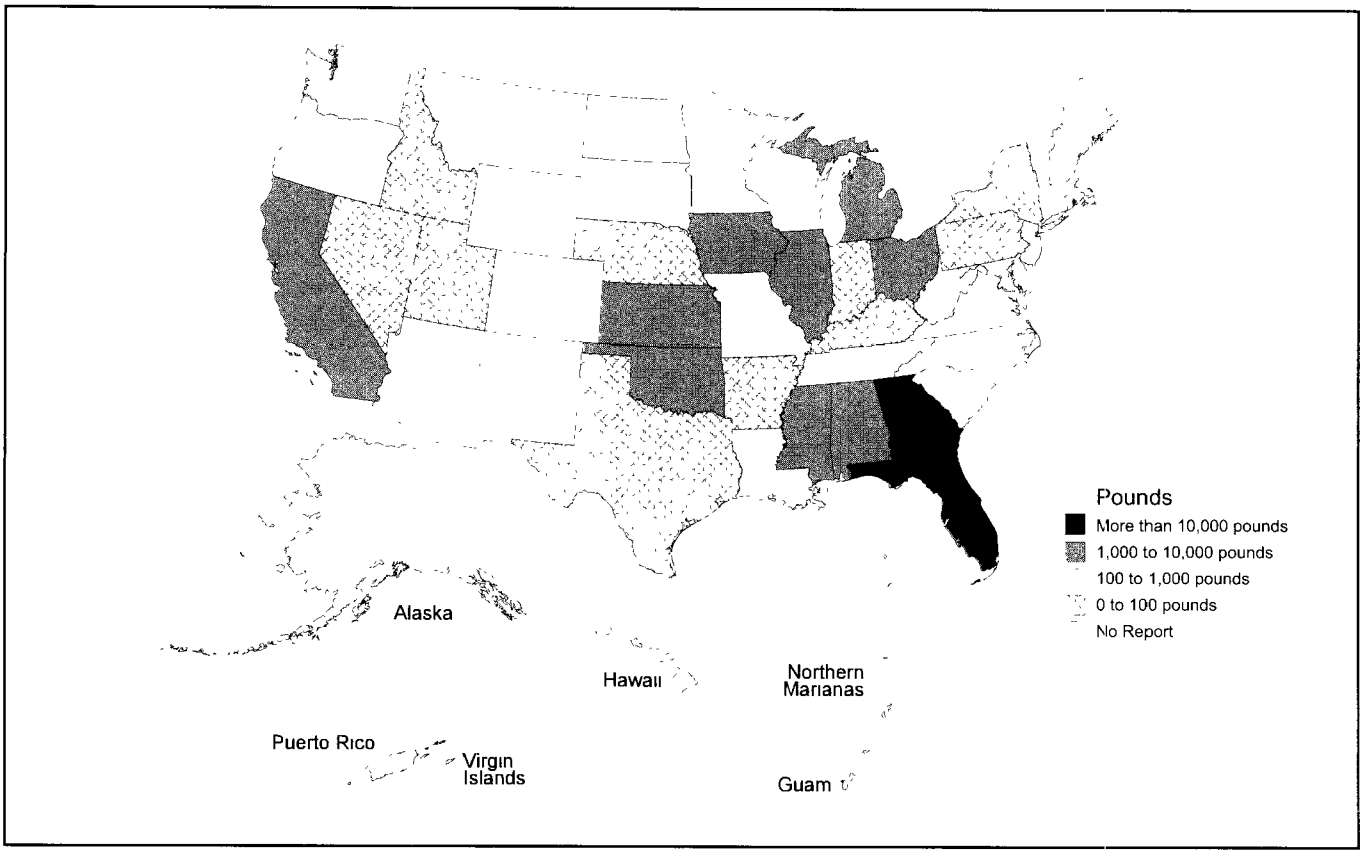
The state with the largest quantity of this group of eight pesticides in production-related waste in 2001 was Texas (see Table 3-81). Texas reported 681,452 pounds and accounted for 25.6 percent of these chemicals in production-related waste. Ohio ranked second with 654,754 pounds (24.6 percent of the

Table 3-80: TRI On-site and Off-site Releases, by State, 2001: Pesticides

		On-site Releases							Off-site Releases	
				Underground Injection		On-site Land Releases				
State	Total Forms	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
Alabama	5	1.56	0.00	0.00	0 00	2,661 00	418.00	3,080.56	0.00	3,080.56
Arkansas	9	24 10	0 00	0.00	0 00	0 00	0 00	24.10	0 00	24 10
California	7	316 00	0.00	0.00	0 00	3,666.70	0 00	3,982.70	450.00	4,432 70
Florida	3	1,262 00	0 00	0 00	0 00	0 00	20,889 00	22,151.00	40,724 00	62,875 00
Georgia	3	180 00	0.00	0.00	0 00	2,275.00	7,974.00	10,429.00	0.00	10,429 00
Idaho	1	0 53	0.00	0 00	0 00	52.09	0 00	52.62	0.00	52 62
Illinois	7	75 16	0 00	0 00	0 00	0.00	0 00	75.16	2,766.42	2,841.58
Indiana	1	2 00	0 00	0 00	0 00	0 00	0 00	2.00	0 00	2 00
Iowa	6	1,335.00	0.00	0 00	0.00	0.00	0 00	1,335.00	0.00	1,335.00
Kansas	2	780 00	0 00	0 00	0 00	0 00	8,800 00	9,580.00	0 40	9,580 40
Kentucky	7	2 67	0 00	0.00	0 00	0.00	0 00	2.67	20 39	23 06
Louisiana	3	1 00	0 00	115.00	0 00	6 00	0 00	122 00	0 00	122 00
Michigan	6	44 00	0 00	0.00	0.00	2,009.00	0 00	2,053.00	1,059.00	3,112 00
Mississippi	2	1,050 00	0 00	0 00	0 00	0 00	0 00	1,050 00	0 00	1,050 00
Missouri	4	68 03	24.00	0.00	0 00	0 00	1.00	93.03	48.00	141 03
Nebraska	6	3 00	0 00	0 00	0 00	0 00	0 00	3 00	64 00	67 00
Nevada	1	0 00	0 00	0.00	0.00	0.00	0 00	0.00	0 00	0 00
New Jersey	10	24 70	252 10	0 00	0 00	621 00	0 00	897 80	25 80	923 60
New York	1	0 00	0 00	0.00	0.00	0.00	0 00	0.00	0 00	0.00
North Dakota	1	0 00	0 00	0 00	0 00	0 00	194 70	194 70	0 00	194 70
Ohio	18	1,388.70	0.00	0.00	0 00	0 00	0.00	1,388.70	5,685.38	7,074.08
Oklahoma	3	0 00	0 00	0 00	0 00	3,090 00	0 00	3,090 00	0 00	3,090 00
Oregon	4	0.00	0 00	0.00	0 00	801 78	0.00	801.78	0.00	801 78
Pennsylvania	4	0 10	0 00	0 00	0 00	0 00	0 00	0.10	0 00	0 10
Texas	11	1 00	6.19	0 14	0 00	0.00	1 00	8.33	0 60	8 93
Utah	5	0 00	0 00	0 00	0 00	0 00	0 00	0 00	1 11	1 11
Total	**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**

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

Map 3-6: Total On- and Off-site Releases, 2001: Pesticides



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

total). Illinois was third with 553,912 pounds or 20.8 percent of the total.

Each of these three states reported most of the quantity of these chemicals in production-related waste as treated on-site. Texas, with the largest total waste and treatment on-site, reported 681,442 pounds treated on-site, which was almost all of the quantity of these chemicals in production-related waste for the state and 28.3 percent of all of the eight pesticides in waste treated on-site in 2001. Ohio's treatment on-site totaled 630,115 pounds or 96.2 percent of the state's total and 26.1 percent of the quantity treated on-site reported by all the states. Illinois reported 551,070 pounds treated on-site, almost 99.5 percent of the state's total.

The state with the largest quantity released on- and off-site was Florida, with 62,875 pounds or 54.4 percent of the total released on- and off-site for all states in 2001.

TRI Data by Industry

On- and Off-site Releases

Only seven industry sectors reported releases of this group of pesticides in 2001. The chemical manufacturing industry reported the largest total releases of any industry sector, 61,546 pounds or 55.3 percent of the total releases (see Table 3-82).

The chemical manufacturing industry also reported the largest amounts of off-site releases (transfers to disposal), with 45,662 pounds representing 89.8 percent of the total off-site releases, and the largest amount of air emissions, with 4,318 pounds or 65.8 percent of the total air emissions.

Table 3-81: Quantities of TRI Chemicals in Waste, by State, 2001: Pesticides

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	0 00	0.00	0.00	0.00	0.00	3.00	2,662.00	2,665.00	0.00
Arkansas	0 00	0 00	330 00	2,642 00	289,124 00	988 00	24 10	293,108 10	0 00
California	2,000.00	0.00	0.00	0.00	0 00	0.20	5,109 80	7,110.00	679.00
Florida	2,000 00	0 00	0 00	0 00	0 00	0 00	62,875 00	64,875 00	0 00
Georgia	0.00	0 00	0.00	0.00	0.00	7,610 00	2,455.00	10,065.00	0.00
Idaho	0 00	0 00	0 00	0 00	0 00	0 00	52 09	52 09	0 00
Illinois	0.00	0.00	0.00	0.00	551,070.00	0.00	2,841.86	553,911.86	0 00
Indiana	0 00	0 00	0 00	0 00	0 00	0 00	11,667 00	11,667 00	0 00
Iowa	0.00	0 00	0.00	0 00	140.00	75,827 00	1,335 00	77,302 00	0.00
Kansas	0 00	0 00	0 00	0 00	0 00	0 40	9,500 00	9,500 40	0 00
Kentucky	0.00	0.00	0.00	0.00	22,529.80	0 00	23.06	22,552.86	0.00
Louisiana	0 00	0 00	0 00	0 00	12 00	38 00	121 00	171 00	0 00
Michigan	0 00	3 00	0.00	7.20	415 00	8 60	3,288 00	3,721 80	0 00
Mississippi	0 00	0 00	0 00	0 00	0 00	80 00	1,050 00	1,130 00	0 00
Missouri	1.00	0 00	0.00	0.00	95,000.00	22,895 00	141.00	118,037.00	0 00
Nebraska	0 00	0 00	0 00	0 00	29,019 00	64 00	3 00	29,086 00	0 00
Nevada	0.00	0 00	0.00	0 00	0.00	103.00	0.00	103.00	0 00
New Jersey	0 00	0 00	0 00	0 00	111,282 10	161 00	923 60	112,366 70	0 00
New York	0.00	0 00	0 00	0 00	0.00	0.00	0.00	0.00	0.00
North Dakota	0 00	0 00	0 00	0 00	0 00	0 00	194 70	194 70	0 00
Ohio	9,700.00	0 00	0.00	0.00	630,115 00	7,613 00	7,325 72	654,753.72	0 00
Oklahoma	0 00	0 00	0 00	0 00	0 00	0 00	3,090 00	3,090 00	0 00
Oregon	0.00	0.00	0.00	0.00	3.10	0 00	801.78	804 88	0.00
Pennsylvania	0 00	0 00	1,666 00	0 00	0 00	0 00	0 10	1,666 10	0 00
Texas	1.00	0 00	0.00	0 00	681,442.00	0 00	9.00	681,452.00	0.00
Utah	0 00	0 00	0 00	0 00	445 72	0 00	1 21	446 93	0 02
Total	**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**

Note: Data are from Section 8 of Form R

The food industry had the second largest total releases, with 30,470 pounds of total releases, most of which were other on-site land releases (that is, other than RCRA subtitle C landfills). These releases by the food industry were 77.6 percent of all other on-site land releases of this group of pesticides in 2001.

The hazardous waste/solvent recovery industry reported the third largest amount of total releases, with 17,440 pounds. This industry had the largest amount of on-site releases to RCRA subtitle C landfills, with 12,287 pounds or 80.9 percent of the total releases in this category for 2001.

Waste Management

The hazardous waste/solvent recovery industry reported the largest amount of these pesticides in production-related waste in 2001 (see Table 3-83). With 2.35 million pounds of these chemicals in pro-

Table 3-82: TRI On-site and Off-site Releases, by Industry, 2001: Pesticides

SIC Code	Industry	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
12	Coal Mining	1	0 00	0 00	0 00	0 00	0 00	194 70	194 70	0 00	194 70
20	Food	4	781 00	0 00	0 00	0 00	0 00	29,689 00	30,470 00	0 00	30,470 00
28	Chemicals	29	4,318 03	276 00	0 00	0 00	2,896 00	8,394 00	15,884 03	45,662 40	61,546 43
30	Plastics	1	180 00	0 00	0 00	0 00	0 00	0 00	180 00	321 00	501 00
32	Stone/Clay/Glass	4	0 10	0 00	0 00	0 00	0 00	0 00	0 10	0 00	0 10
39	Miscellaneous	1	1,110 00	0.00	0 00	0 00	0 00	0 00	1,110 00	0 00	1,110 00
7389/4953	Hazardous Waste/Solvent Recovery	90	170 42	6 29	115 14	0 00	12,286 57	0 00	12,578 42	4,861 70	17,440 11
	Total	**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**

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

Table 3-83: Quantities of TRI Chemicals in Waste, by Industry, 2001: Pesticides

SIC Code	Industry	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On- and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-production-related Waste Managed Pounds
12	Coal Mining	0 00	0 00	0 00	0 00	0 00	0 00	194 70	194 70	0 00
20	Food	0 00	0 00	0 00	0 00	86 00	10 00	30,399 00	30,495 00	0 00
28	Chemicals	8,002 00	0 00	0 00	0 00	95,615 00	113,857 40	53,830 00	271,304 40	679 00
30	Plastics	0 00	0 00	0 00	0 00	0 00	0 00	501 00	501 00	0 00
32	Stone/Clay/Glass	0 00	0 00	1,666 00	0 00	0 00	0 00	0 10	1,666 10	0 00
39	Miscellaneous	5,700 00	0 00	0 00	0 00	0 00	0 00	1,100 00	6,800 00	0 00
7389/4953	Hazardous Waste/Solvent Recovery	0 00	3 00	330 00	2,649 20	2,314,896 72	1,523 80	29,469 22	2,348,871.94	0 02
	Total	**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**

Note: Data are from Section 8 of Form R

duction-related waste, this industry sector accounted for 88.3 percent of the total for these chemicals. A total of 2.31 million pounds of these pesticides were treated on-site by the hazardous waste/solvent recovery industries, representing 98.6 percent of this industry's total for these chemicals in waste.

The chemical manufacturing industry reported the second largest amount of this group of pesticides in production-related waste, with a total of 271,304 pounds. This was 10.2 percent of total production-related waste of these pesticides in 2001. The chemical industry's amount treated off-site (113,857 pounds) represented 98.7 percent of the total amount of these pesticides treated off-site in 2001.

Projected Quantities of TRI Chemicals Managed in Waste, 2001-2003

TRI facilities expected to decrease the quantity of this group of pesticides in production-related waste between 2001 and 2002 by 8.6 percent, from 2.7 million pounds to 2.4 million pounds, with an increase of 0.8 percent to 2.5 million pounds by 2003 (see Table 3-84). This would add up to an overall decrease of 7.8 percent from 2001 to 2003.

The decrease was projected to occur in amounts treated on- and off-site. Treatment on-site was projected to decrease by 5.4 percent from 2001 to 2003 and treatment off-site by 61.8 percent. The quantity released on- and off-site was projected to decrease by 4.3 percent from 2001 to 2003. On- and off-site

Table 3-84: Prior Year, Current Year and Projected Quantities of TRI Chemicals in Waste, 2000-2003: Pesticides

Waste Management Activity	Prior Year 2000 Total Pounds	Prior Year 2000 Percent of Total	Current Year 2001 Total Pounds	Current Year 2001 Percent of Total	Projected 2002 Total Pounds	Projected 2002 Percent of Total	Projected 2003 Total Pounds	Projected 2003 Percent of Total
Recycled On-site	13,501 00	0 5	13,702.00	0.5	13,702 00	0.6	13,702.00	0.6
Recycled Off-site	0 00	0.0	3.00	0 0	0 00	0 0	0 00	0 0
Energy Recovery On-site	1,569 00	0.1	1,996.00	0.1	2,045.00	0.1	2,096 00	0.1
Energy Recovery Off-site	983 00	0 0	2,649 20	0 1	2,026 00	0 1	2,026 00	0 1
Treated On-site	2,333,821.97	91.8	2,410,597.72	90.6	2,257,396 77	92 8	2,279,300.30	93.0
Treated Off-site	110,506 14	4 3	115,391 20	4 3	46,103 10	1 9	44,029 15	1 8
Quantity Released On- and Off-site	82,422.90	3 2	115,494.02	4.3	111,046 87	4.6	110,552 82	4 5
Total Production-related Waste Managed	**2,542,804.01**	**100.0**	**2,659,833.14**	**100.0**	**2,432,319.74**	**100.0**	**2,451,706.27**	**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	1 5	0.0	0 0	0.0
Recycled Off-site	--	-100.0	--	-100 0
Energy Recovery On-site	27 2	2.5	2 5	5.0
Energy Recovery Off-site	169 5	-23 5	0 0	-23 5
Treated On-site	3 3	-6 4	1.0	-5.4
Treated Off-site	4 4	-60 0	-4 5	-61 8
Quantity Released On- and Off-site	40.1	-3.9	-0.4	-4.3
Total Production-related Waste Managed	**4.6**	**-8.6**	**0.8**	**-7.8**

Note: Data from Section 8 of Form R for 2001

Table 3-85: Number of Forms Reporting Source Reduction Activity, by Category, 2001: Pesticides

			Forms Reporting Source Reduction Activity		Category of Source Reduction Activity							
CAS Number	Chemical	Total Form Rs Number	Number	Percent of All Form Rs Percent	Good Operating Practices Number	Inventory Control Number	Spill and Leak Prevention Number	Raw Materials Modifications Number	Process Modifications Number	Cleaning and Degreasing Number	Surface Preparation and Finishing Number	Product Modifications Number
309-00-2	Aldrin	8	1	12.5	1	0	0	0	0	0	0	0
57-74-9	Chlordane	20	2	10 0	2	0	0	0	0	0	0	0
76-44-8	Heptachlor	15	2	13 3	2	0	0	0	0	0	0	0
465-73-6	Isodrin	5	1	20 0	1	0	0	0	0	0	0	0
72-43-5	Methoxychlor	15	3	20 0	3	0	0	0	0	0	0	0
40487-42-1	Pendimethalin	18	5	27 8	5	0	0	0	0	0	0	0
8001-35-2	Toxaphene	18	5	27 8	3	0	1	0	1	0	0	0
1582-09-8	Trifluralin	31	9	29 0	7	1	1	0	0	0	0	0
	Total	**130**	**28**	**21.5**	**24**	**1**	**2**	**0**	**1**	**0**	**0**	**0**

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

releases are the least-desirable outcome under the waste management hierarchy described in **Waste Management** in Chapter 1 (Figure 1-2).

The actual change from the prior reporting year of 2000 to 2001 was an increase of 4.6 percent, from 2.5 million pounds to 2.7 million pounds.

Source Reduction

In 2001, 28 forms were filed reporting source reduction activities for this group of pesticides (see Table 3-85). As noted in **Waste Management** in Chapter 1, source reduction—an activity that prevents the generation of waste—is preferred to waste management. These 28 forms represented 21.5 percent of all forms submitted for these pesticides in 2001.

Good operating practices was the type of source reduction used for the majority of forms (24 out of 28).

On- and Off-site Releases, 2000-2001

On- and off-site releases of this group of pesticides increased from 81,730 pounds to 111,262 pounds from 2000 to 2001, an increase of 36.1 percent (see Table 3-86). This was due to an increase in off-site releases (transfers to disposal), which increased by 38,184 pounds or over 300 percent. On-site releases decreased, by 8,652 pounds or 12.5 percent.

The increase in off-site releases (transfers to disposal) of this group of pesticides was primarily due to the increase in transfers to waste brokers for disposal. Such transfers increased by 37,265 pounds. Transfers to landfills/surface impoundments also increased, by 1,918 pounds. On the other hand, transfers to storage only decreased by 2,130 pounds.

The decreases in on-site releases of this group of pesticides was primarily due to decreases in on-site releases to RCRA subtitle C landfills, which decreased by 18,525 pounds or 55.0 percent. Except for surface water discharges, other types of on-site releases increased from 2000 to 2001. Releases to other on-site landfills (that is, other than RCRA subtitle C landfills) increased by 9,780 pounds or 34.3 percent. Air emissions and underground injection also showed small increases.

Waste Management Data, 2000-2001

Quantities of TRI Chemicals in Waste, 2000-2001

The quantity of these pesticides in production-related waste increased from 2.6 million pounds in 2000 to 2.7 million pounds in 2001, an increase of 4.2 percent (see Table 3-87). The amount treated on-site increased by 97,858 pounds or 4.2 percent. The quantity released on- and off-site increased by 28,196 pounds or 32.3 percent.

Table 3-86: TRI On-site and Off-site Releases, 2000-2001: Pesticides

	2000	2001	Change 2000-2001	
	Number	Number	Number	Percent
Forms	7,092	7,233	141	2 0
On-site Releases	**Pounds**	**Pounds**	**Pounds**	**Percent**
Total Air Emissions	6,529 64	6,559.55	29.91	0 5
Surface Water Discharges	330 62	282 29	-48 33	-14 6
Underground Injection	3 16	115 14	111.97	3,542 4
Class I Wells	3 16	115 14	111 97	3,542 4
Class II-V Wells	0.00	0.00	0 00	--
On-site Land Releases	62,205 32	53,460 27	-8,745 05	-14 1
RCRA Subtitle C Landfills	33,707.32	15,182.57	-18,524.75	-55.0
Other On-site Land Releases	28,498 00	38,277 70	9,779 70	34 3
Total On-site Releases	**69,068.74**	**60,417.25**	**-8,651.50**	**-12.5**
Off-site Releases				
Storage Only*	5,613.00	3,483 00	-2,130.00	-37.9
Solidification/Stabilization** Metals and Metal Category Compounds Only	0 00	0 00	0 00	--
Wastewater Treatment (Excluding POTWs)*** Metals and Metal Category Compounds Only	0 00	0 00	0 00	--
Transfers to POTWs**** Metals and Metal Category Compounds Only	0 00	0 00	0 00	--
Underground Injection	0 00	0 00	0 00	--
Landfills/Surface Impoundments	1,865 87	3,783.72	1,917.85	102.8
Land Treatment	0 00	0 00	0 00	--
Other Land Disposal	41.00	0.00	-41 00	-100.0
Other Off-site Management	0 00	0 00	0 00	--
Transfers to Waste Broker for Disposal	4,905.10	42,170 00	37,264.90	759.7
Unknown*****	236 63	1,408 38	1,171 75	495 2
Total Off-site Releases (Transfers Off-site to Disposal)	**12,661.60**	**50,845.10**	**38,183.50**	**301.6**
Total On- and Off-site Releases	**81,730.34**	**111,262.34**	**29,532.00**	**36.1**

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 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)

Table 3-87: Quantities of TRI Chemicals in Waste by Waste Management Activity, 2000-2001: Pesticides

Waste Management Activity	2000	2001	Change 2000-2001	
	Pounds	Pounds	Pounds	Percent
Recycled On-site	11,501.00	13,702.00	2,201 00	19.1
Recycled Off-site	0 00	3 00	3 00	--
Energy Recovery On-site	1,569.00	1,996.00	427.00	27.2
Energy Recovery Off-site	983 00	2,649 20	1,666 20	169 5
Treated On-site	2,312,740.17	2,410,597.72	97,857.55	4.2
Treated Off-site	139,269 19	115,391 20	-23,877 99	-17 1
Quantity Released On- and Off-site	87,297.74	115,494.02	28,196 28	32.3
Total Production-related Waste Managed	**2,553,360.10**	**2,659,833.14**	**106,473.04**	**4.2**
Non-production-related Waste Managed	45.00	679.02	634.02	1,408.9

Note: Data are from Section 8 of Form R of year indicated

Table 3-88: TRI Transfers Off-site for Further Waste Management, including Disposal, 2000-2001: Pesticides

	2000	2001	Change 2000-2001	
	Pounds	Pounds	Pounds	Percent
Transfers to Recycling	0.00	179.00	179.00	--
Transfers to Energy Recovery	1,003.00	2,648.15	1,645 15	164 0
Transfers to Treatment	126,726.55	127,370.82	644 27	0.5
Transfers to POTWs	13 00	11 00	-2 00	-15.4
Metals and Metal Category Compounds Only	0.00	0.00	0.00	--
Non-metal TRI Chemicals	13.00	11 00	-2.00	-15.4
Other Off-site Transfers*	0.00	0.00	0.00	--
Other Off-site Transfers to Disposal**	12,831 60	51,759 94	38,928 34	303 4
Total Transfers for Further Waste Management, including Disposal	**140,574.15**	**181,968.91**	**41,394.76**	**29.4**

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

The only type of waste management activity that decreased from 2000 to 2001 was treatment off-site. The amount of this group of pesticides in waste treated off-site decreased by 23,878 pounds or 17.1 percent.

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

As shown in Table 3-88, transfers off-site for further waste management, including disposal, of this group of pesticides increased from 2000 to 2001, by 41,395 pounds or 29.4 percent. Other off-site transfers to disposal increased by 38,928 pounds or over 300 percent. This group of pesticides in waste sent for energy recovery also increased, by 1,645 pounds or 164.0 percent.

The only type of transfers showing a decrease was transfers to POTWs, which decreased by 2 pounds or 15.4 percent.

Other PBT Chemicals

INTRODUCTION

There are four other PBT chemicals, hexachlorobenzene, octachlorostyrene, pentachlorbenzene, and tetrabromobisphenol A that are covered in this section.

Hexachlorobenzene, also known as HCB; HEXA C.B.; phenyl perchloryl; and perchlorobenzene, is an organo-chlorine compound. It is a white crystalline solid created by the chlorination of benzene. Hexachlorobenzene was once used as an agricultural fungicide, but health concerns about its toxicity led to the cancellation of the registrations of all pesticides that contained hexachlorobenzene as an active ingredient. Its primary use was to treat wheat seeds, onions, and sorghum. As late as 1985 it was used to prevent wheat smut. Although no longer used as an active ingredient in pesticides, hexachlorobenzene is a byproduct impurity contained in the pesticides ametryn, atrazine, cyanazine, dacthal, dienochlor, dipropetryn, lindane, maleic hydrazide, mirex, pentachloronitrobenzine, picloram, prometon, prometryn, propazine, simazine, and terbutryn.

Octachlorostyrene is a polychlorinated styrene that is an unwanted byproduct of chlorine production, chlorination reactions, and metal product/finishing operations such as the production of metallic magnesium and dry etching of aluminum. Octachlorostyrene may also be formed by the high-temperature incineration of chlorinated hydrocarbons. It is not a commercial product, and no commercial uses are known.

Pentachlorobenzene is formed by the chlorination of benzene. Pentachlorobenzene is not used as an end product. It is made as an intermediate in the production of the fungicide pentachloronitrobenzene (quintozene) and is an impurity remaining in the end product. Quintozene has been commercially produced since the 1930s and is also referred to as PCNB and PkhNB. It has also been marketed under the following trade names: Avicol, Earthcide, Folosan, Kobu, Kobutol, Pentagen, RTU, PCNB, Terrachlor, Terrazan and Tri-PCNB. It is a white or colorless crystalline solid with a characteristic pleasant odor.

Tetrabromobisphenol A, otherwise known as TBBPA, is a white, crystalline powder that is soluble in methanol and ether. TBBPA is a brominated flame retardant and is often used in plastics and engineering resins for printed circuit boards and computer equipment.

More details on these four chemicals, their sources, chemical characteristics, health and environmental effects and efforts being undertaken to reduce pollution from the chemicals can be found in the *2000 Toxics Release Inventory Public Data Release Report* (EPA 260-R-02-003).

2001 TRI DATA FOR OTHER PBT CHEMICALS

On-site and Off-site Releases, 2001

As shown in Table 3-89, there were 168 TRI forms submitted for 2001 for the PBT chemicals: hexachlorobenzene, octachlorostyrene, pentachlorobenzene and tetrabromobisphenol A. On- and off-site releases for these PBT chemicals totaled 915,807 pounds. Tetrabromobisphenol A had the largest releases of this group, with 876,171 pounds or 95.7 percent of the total releases for these PBT chemicals. Releases of hexachlorobenzene, the chemical with the most number of forms and the second largest releases of these PBT chemicals, were 36,175 pounds (4.0 percent of the total). Pentachlorobenzene followed with 2,760 pounds and octachlorostyrene had 702 pounds.

Off-site releases (transfers to disposal) were the largest type of release for these PBT chemicals, accounting for 69.6 percent of total releases, or 637,304 pounds (see Figure 3-19). Other on-site

Table 3-89: TRI On-site and Off-site Releases, 2001: Other PBTs

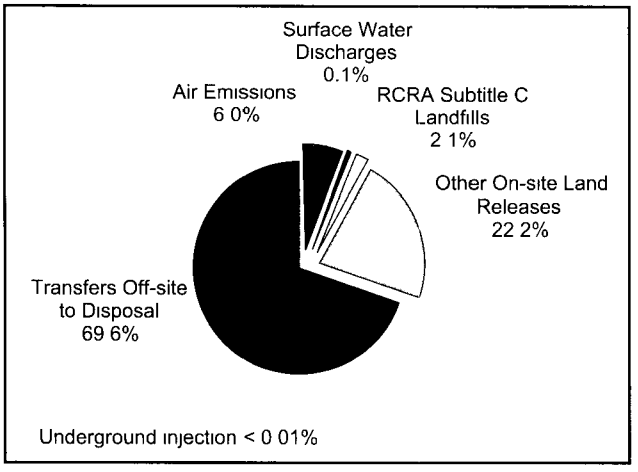
			On-site Releases							Off-site	
					Underground Injection		On-site Land Releases			Releases	Total
CAS Number	Chemical	Total Forms	Total Air Emissions	Surface Water Discharges	Class I Wells	Class II-V Wells	RCRA Subtitle C Landfills	Other On-site Land Releases	Total On-site Releases	Transfers Off-site to Disposal	On- and Off-site Releases
		Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
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	**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**

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

land releases (that is, other than RCRA subtitle C landfills) were the second largest type of release, accounting for 22.2 percent of total releases or 203,736 pounds. (Types of on-site land releases are described in Box 1-4 in Chapter 1.) Air emissions totaled 55,273 pounds or 6.0 percent of total releases for these PBT chemicals. Releases to RCRA subtitle C landfills totaled 19,007 pounds. Surface water discharges and underground injection of these PBT chemicals totaled 487 pounds.

For tetrabromobisphenol A, off-site releases were 625,482 pounds representing 71.4 percent of the total releases for this chemical. Another 196,675 pounds or 22.4 percent were other on-site land releases (that is, other than RCRA subtitle C landfills) and 54,005 pounds or 6.2 percent were air emissions.

Figure 3-19: Distribution of TRI On-site and Off-site Releases, 2001: Other PBTs



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

Hexachlorobenzene's releases of 36,175 pounds were divided between 18,587 pounds of on-site land releases to RCRA subtitle C landfills (51.4 percent of the total releases for the chemical), 11,107 pounds of off-site releases (transfers to disposal) (30.7 percent of this chemical's total releases total), and 4,938 pounds of other on-site land releases (13.6 percent of the total releases for the chemical).

Pentachlorobenzene's releases were primarily other on-site land releases (that is, other than RCRA subtitle C landfills), with 1,930 pounds representing 69.9 percent of the chemical's total releases, 420 pounds to RCRA subtitle C landfills (15.2 percent of the chemical's total releases), and 206 pounds of off-site releases (transfers to disposal) (7.5 percent of the chemical's total releases).

Almost three-quarters (509 pounds out of 702 pounds) of the total releases of octachlorostyrene were off-site releases (transfers to disposal). Octachlorostyrene also had 193 pounds in other on-site land releases (that is, other than RCRA subtitle C landfills).

Waste Management Data, 2001

Quantities of TRI Chemicals in Waste

As shown in Table 3-90, there were 8.2 million pounds of these chemicals in production-related waste in 2001. Much (6.8 million pounds or 83.1

Table 3-90: Quantities of TRI Chemicals in Waste, 2001: Other PBTs

CAS Number	Chemical	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On- and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-production-related Waste Managed Pounds
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	**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**

Note: Data are from Section 8 of Form R

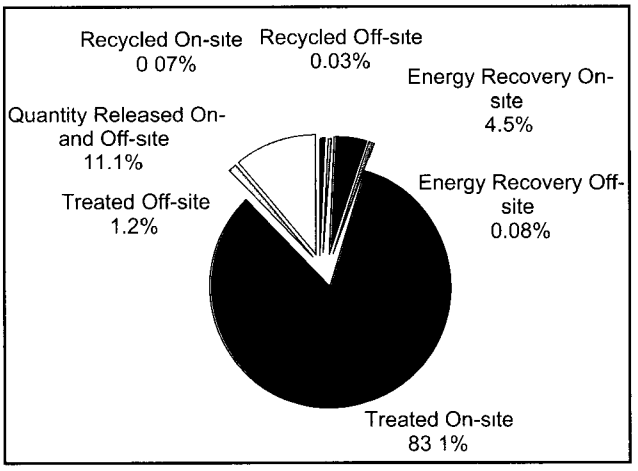
percent) of this was treated on-site (see Figure 3-20). Another 11.1 percent (906,016 pounds) was released on- and off-site site.

Hexachlorobenzene accounted for 6.7 million pounds or 82.2 percent of the quantity of these PBT chemicals. Most was treated on-site. The 6.3 million pounds of hexachlorobenzene treated on-site represented 93.0 percent of the total quantity of hexachlorobenzene in production-related waste in 2001.

There were 1.0 million pounds of tetrabromobisphenol A in production-related waste reported for 2001. A total of 85.0 percent (854,020 pounds) of this was released on- and off-site.

There were 452,513 pounds of pentachlorobenzene in production-related waste, with 445,846 pounds treated on-site. On-site treatment accounted for 98.5 percent of the total in 2001.

Figure 3-20: Distribution of Quantities of TRI Chemicals in Waste, 2001: Other PBTs



Note: Data are from Section 8 of Form R

There were 710 pounds of octachlorostyrene in production-related waste reported for 2001. Almost all (702 pounds) of it was released on- and off-site.

Transfers Off-site for Further Waste Management, including Disposal

Transfers off-site for further waste management, including disposal, of these PBT chemicals totaled 735,174 pounds in 2001 (see Table 3-91). Other off-site transfers to disposal accounted for 87.6 percent of the transfers for further waste management, including disposal (see Figure 3-21). Transfers to treatment accounted for 11.2 percent.

Transfers off-site for further waste management, including disposal, of tetrabromobisphenol A totaled 672,781 pounds for 2001, 93.0 percent of which was off-site transfers to disposal.

For hexachlorobenzene, transfers off-site for further waste management, including disposal, were 55,036 pounds. Such transfers consisted of 33,377 pounds (60.6 percent) of transfers to treatment, 18,073 pounds (32.8 percent) of other transfers to disposal, and smaller amounts of transfers to energy recovery and recycling.

Transfers off-site for further waste management, including disposal, of pentachlorobenzene totaled 6,849 pounds with 64.0 percent as transfers to treatment and 21.8 percent as transfers to energy recovery.

The 509 pounds of transfers off-site for further waste management, including disposal, of octachlorostyrene were all other transfers to disposal.

Table 3-91: TRI Transfers Off-site for Further Waste Management, including Disposal, 2001: Other PBTs

CAS Number	Chemical	Transfers to Recycling Pounds	Transfers to Energy Recovery Pounds	Transfers to Treatment Pounds	Transfers to POTWs: Metals and Metal Category Compounds Pounds	Transfers to POTWs: Non-metal TRI Chemicals Pounds	Other Off-site Transfers* Pounds	Other Off-site Transfers to Disposal** Pounds	Total Transfers for Further Waste Management, including Disposal Pounds
118-74-1	Hexachlorobenzene	1,432 02	2,132.80	33,376 71	0 00	20 90	0.10	18,073.14	55,035 66
29082-74-4	Octachlorostyrene	0 00	0 00	0 00	0 00	0 00	0 00	508 60	508 60
608-93-5	Pentachlorobenzene	770.00	1,491.00	4,381.36	0.00	0.00	0.00	206.32	6,848.68
79-94-7	Tetrabromobisphenol A	12 00	2,979 20	44,299 30	0 00	9 00	0 00	625,481 75	672,781 25
	Total	**2,214.02**	**6,603.00**	**82,057.37**	**0.00**	**29.90**	**0.10**	**644,269.81**	**735,174.19**

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

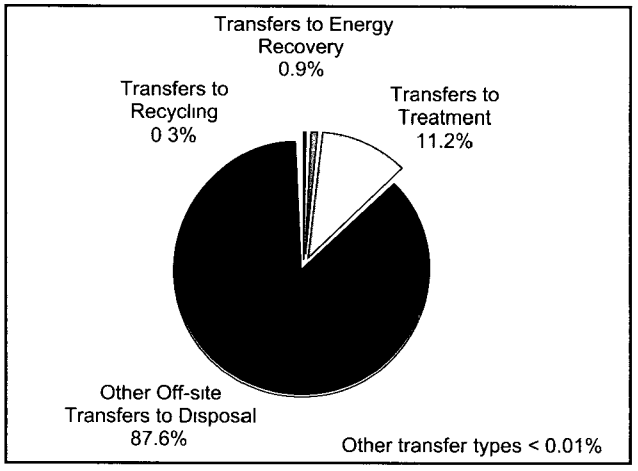
TRI Data by State

Facilities in Texas submitted the largest number of forms, 15, in 2001 for these PBT chemicals. Louisiana submitted the second largest number of forms, with 13, and California was third with 10.

On- and Off-site Releases

In 2001, facilities in Arkansas reported the largest total on- and off-site releases of these PBT chemicals (see Table 3-92). They reported a total of 841,490 pounds, or 91.9 percent of the total for 2001, of which all but 5 pounds was tetrabisphenol A. South Carolina reported the second largest amount with 13,952 pounds, which was 1.5 percent of the total.

Figure 3-21: Distribution of TRI Transfers Off-site for Further Waste Management, including Disposal, 2001: Other PBTs



Note: Transfers Off-site for Further Waste Management, including Disposal are from Section 6 of Form R

Arkansas' releases consisted of off-site releases (transfers to disposal), other on-site land releases (that is, other than RCRA subtitle C landfills), and air emissions. Off-site releases from Arkansas facilities represented 71.3 percent (600,030 pounds) of total releases in Arkansas, other on-site land releases were 22.6 percent (190,000 pounds), and air emissions were 6.1 percent (51,460 pounds).

South Carolina facilities reported 13,952 pounds of total releases, of which 56.7 percent were off-site releases (transfers to disposal) and 43.3 percent were other on-site land releases (land releases to other than RCRA subtitle C landfills).

As shown in Map 3-7, releases of these PBT chemicals were concentrated in Arkansas with 841,490 pounds. Fourteen other states reported between 1,000 and 15,000 pounds of total releases.

Waste Management Data

The states with the largest quantity of these PBT chemicals in production-related waste in 2001 were Louisiana and Texas (see Table 3-93). Louisiana reported 3.6 million pounds and accounted for 44.0 percent of the total for these PBT chemicals. Texas reported 3.2 million pounds and accounted for 39.3 percent of the total. Arkansas ranked third with 898,123 pounds (11.0 percent of the total).

Both Louisiana and Texas reported most of these PBT chemicals in production-related waste as treated on-site. Over 3.2 million pounds (90.0 percent) of these chemicals in production-related waste in

Table 3-92: TRI On-site and Off-site Releases, by State, 2001: Other PBTs

		On-site Releases							Off-site Releases	Total
				Underground Injection		On-site Land Releases				
State	Total Forms	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	On- and Off-site Releases
	Number	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Alabama	9	1,185.00	0.00	0 00	0.00	900.00	0.00	2,085.00	0 00	2,085.00
Arizona	3	2.21	0 00	0 00	0 00	0 00	0.00	2 21	215 50	217 71
Arkansas	6	51,460.02	0.00	0 00	0 00	0.00	190,000.00	241,460.02	600,030 00	841,490.02
California	10	7 73	0.03	0 00	0 00	457 00	0.00	464.76	7,790 78	8,255 53
Colorado	2	0 00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 00
Connecticut	2	5 80	0.00	0 00	0 00	0 00	0 00	5 80	254.00	259 80
Delaware	4	0.00	67.82	0.00	0.00	0 00	170.60	238.42	1,382.20	1,620 62
Florida	2	0 00	0.00	0 00	0 00	0 00	0 00	0.00	0 00	0 00
Georgia	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Illinois	7	239 27	1.00	0 00	0 00	0 00	0 00	240.27	12.25	252 52
Indiana	4	9.55	8.00	0 00	0.00	0.00	0.00	17.55	88 00	105.55
Iowa	2	11.80	0 00	0 00	0 00	0.00	0.00	11.80	0 00	11 80
Kansas	3	0.00	0.00	20.00	0.00	0.00	0.00	20.00	188 25	208.25
Kentucky	3	0 21	9 00	0.00	0.00	0.00	0 00	9 21	0.00	9 21
Louisiana	13	614.73	14.00	0.00	0.00	7,500.00	0 00	8,128 73	0.60	8,129.33
Maryland	2	0 00	0 10	0.00	0.00	0.00	27 50	27 60	0.00	27.60
Massachusetts	1	0.00	0.00	0 00	0.00	0.00	0.00	0.00	109.00	109.00
Michigan	6	124 51	0.00	0 00	0 00	4,189 00	0 00	4,313 51	2,467.00	6,780.51
Minnesota	3	0.00	0.00	0 00	0.00	0.00	0.00	0 00	0.00	0.00
Mississippi	6	1.40	0.00	0 00	0 00	0 00	4,008 40	4,009 80	0.00	4,009.80
Missouri	2	20.00	0.00	0.00	0 00	0.00	0.00	20.00	0.00	20.00
Montana	1	11 70	0 00	0 00	0 00	0 00	0.00	11 70	0.00	11.70
Nebraska	1	4.00	0 00	0.00	0.00	0.00	0.00	4.00	0.00	4.00
Nevada	1	0 00	0 00	0 00	0.00	5,492.00	0.00	5,492.00	0 00	5,492 00
New Hampshire	2	2 20	0 00	0.00	0.00	0.00	0.00	2.20	0.00	2.20
New Jersey	5	98.40	48 00	0 00	0 00	291.00	0.00	437 40	74 60	512.00
New York	5	35 56	0.30	0.00	0.00	0.00	0.00	35 86	7,309.30	7,345.16
North Carolina	3	0.00	0.00	0 00	0 00	0 00	0 00	0 00	0 10	0.10
Ohio	7	0 46	3 68	0 00	0 00	0.00	0 00	4.14	828.67	832.81
Oklahoma	1	62 00	0 00	0 00	0 00	0 00	0.00	62.00	0.00	62.00
Oregon	4	0 00	0 00	0.00	0.00	166.97	0.00	166.97	23.65	190.62
Pennsylvania	4	269 00	0.00	0.00	0.00	0.00	0.00	269 00	156 00	425 00
South Carolina	4	0 00	0.00	0.00	0.00	0.00	6,040.00	6,040.00	7,912.00	13,952.00
Tennessee	8	75 21	281 00	0 00	0 00	0 00	2,118.00	2,474.21	272.00	2,746 21
Texas	15	74 64	30.50	3.48	0.02	11.00	0.00	119.63	6,613.00	6,732.63
Utah	5	0 00	0 00	0 00	0.00	0.00	736 00	736 00	269 17	1,005 17
Washington	7	956.00	0.00	0.00	0.00	0.00	0 00	956 00	673.00	1,629 00
West Virginia	2	2 00	0 00	0 00	0 00	0 00	0 00	2 00	0.00	2.00
Wisconsin	1	0 00	0 00	0.00	0 00	0.00	635.00	635.00	635.00	1,270.00
Total	**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**

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

Louisiana was treated on-site, and almost 3.2 million pounds (97.8 percent) in Texas was also treated on-site. Most of the amount treated on-site in both Louisiana and Texas was hexachlorobenzene.

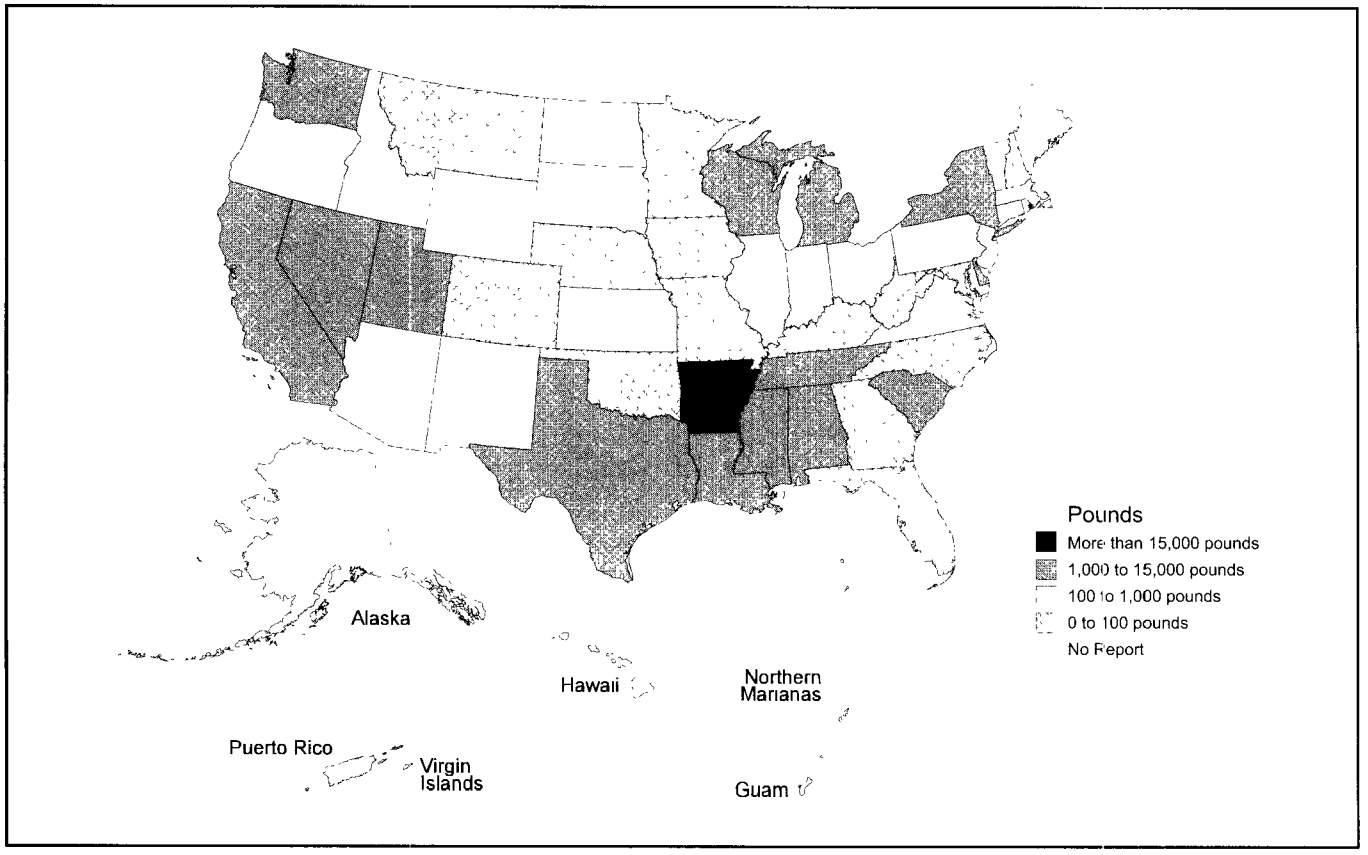
Arkansas reported the largest quantity released on- and off-site, with 833,618 pounds, which was 92.8 percent of these PBT chemicals in production-related waste for Arkansas in 2001.

TRI Data by Industry

On- and Off-site Releases

Only eleven individual industry sectors reported releases of these PBT chemicals in 2001. The chemical manufacturing sector reported the largest total releases of any industry sector, with 859,059 pounds or 93.8 percent of the total releases (see Table 3-94). More than two-thirds (608,280 pounds) of the releases for the chemical industry were off-site releases (transfers to disposal). Almost 22.9 percent (196,325 pounds) of the releases of the chemicals industry were other on-site land releases

Map 3-7: Total On- and Off-site Releases, 2001: Other PBTs



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

(that is, other than RCRA subtitle C landfills). A total of 53,679 pounds of air emissions of these PBT chemicals were reported by the chemicals industry, accounting for 6.2 percent of total releases for this industry.

The hazardous waste/solvent recovery industries reported the second largest amount of total releases, with 22,559 pounds, and the largest on-site land releases to RCRA subtitle C landfills, with 18,705 pounds. On-site land releases to RCRA subtitle C landfills accounted for 82.9 percent of releases of these PBT chemicals by the hazardous waste/solvent recovery industries in 2001.

The electrical equipment industry had the third largest total releases, with 15,991 pounds of total releases. Off-site releases (transfers to disposal) accounted for 58.2 percent (9,310 pounds) of total releases of the electrical equipment industry. This sector also reported 6,675 pounds of other on-site land releases (that is, other than RCRA subtitle C landfills), representing 41.7 percent of total releases of the electrical equipment industry.

Waste Management

The chemical manufacturing industry reported the largest amount of these PBT chemicals in production-related waste in 2001 (see Table 3-95). With 6.4 million pounds, this industry sector accounted for 78.1 percent of these PBT chemicals in production-related waste. Most of the chemical industry's quantity of these chemicals in production-related waste (79.8 percent or 5.1 million pounds) was treated on-site and 13.5 percent (863,540 pounds) was released on- and off-site.

Table 3-93: Quantities of TRI Chemicals in Waste, by State, 2001: Other PBTs

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	0.00	0.00	0 00	1,257.10	0.10	1,053.00	2,085 00	4,395 20	0.00
Arizona	0 00	0 00	0 00	383 00	0 00	1,700 00	217 71	2,300 71	0 00
Arkansas	0 00	0.00	330.00	1,491.00	60,409.00	2,275.00	833,618.02	898,123.02	0.00
California	5,400 00	516 20	0 00	2,190 00	1,800 00	24,886 00	687 72	35,479 92	0 10
Colorado	0.00	1,680.00	0.00	0 00	0.00	360 00	0 00	2,040.00	0 00
Connecticut	556 00	0 00	0 00	0 00	0 00	80 00	259 00	895 00	0 00
Delaware	0.00	0 00	0 00	0.00	0 00	0.00	1,620 62	1,620.62	0.00
Florida	0 00	0 00	0 00	0 00	0 00	2,816 00	0 00	2,816 00	0 00
Georgia	0 00	0 00	0 00	0 00	0.00	0 00	0.00	0.00	0.00
Illinois	0 00	0 00	0 00	100 00	2,441 00	89 00	252 00	2,882 00	0 00
Indiana	0 00	0.00	16,754 00	40 20	74 00	0 00	105.55	16,973 75	0 00
Iowa	0 00	0 00	0 00	0 00	0 00	0 40	11 80	12 20	0 00
Kansas	0 00	0 00	2,100.00	19 00	0 00	58 00	267 25	2,444.25	0.00
Kentucky	8 00	0 00	0 00	0 00	487 00	0 00	9 21	504 21	0 00
Louisiana	0 10	0.00	350,000 00	0 00	3,242,428 00	2,863.99	8,128 43	3,603,420 52	6,683.23
Maryland	0 00	0 00	0 00	0 00	0 00	0 00	27 60	27 60	0 00
Massachusetts	0.00	0.00	0 00	0.00	0.00	0.00	109 00	109.00	0 00
Michigan	0 00	5 80	0 00	13 40	871 00	16 00	6,780 50	7,686 70	0 00
Minnesota	0 00	0 00	0 00	0.10	0 00	0.00	0.00	0 10	0 00
Mississippi	0 00	0 00	0 00	0 00	0 00	0 33	4,009 80	4,010 13	0 00
Missouri	0.00	0 00	0.00	0 00	0.00	460 00	20.00	480 00	0.00
Montana	0 00	0 00	0 00	0 00	0 00	0 00	11 70	11 70	0 00
Nebraska	0 00	0 00	0 00	0 00	38,020 00	0.00	4 00	38,024.00	0.00
Nevada	0 00	0 00	0 00	0 00	0 00	0 00	5,492 00	5,492 00	0 00
New Hampshire	0.00	0.00	0.00	0 00	0 00	405 00	2.20	407.20	0 00
New Jersey	0 00	0 00	0 00	0 00	79,073 70	1,833 50	512 00	81,419 20	0 00
New York	0 00	0 00	0 00	1,054 00	183 00	3 00	7,311.51	8,551 51	5,680.00
North Carolina	0 00	0 00	0 00	0 00	0 00	0 00	0 10	0 10	0 00
Ohio	0 00	0 00	0 00	0 00	219,025.00	537.00	835 56	220,397.56	0.00
Oklahoma	0 00	0 00	0 00	0 00	0 00	0 00	62 00	62 00	0 00
Oregon	0 00	0.00	0.00	0.00	0 00	17 15	190 62	207.77	0.00
Pennsylvania	0.00	0 00	0 00	0 00	265 00	37 00	425 00	727 00	0 00
South Carolina	0.00	311 00	0 00	3.50	0.00	1.00	7,912 00	8,227.50	0 00
Tennessee	0 00	0 00	116 64	0 00	501 00	2,662 00	2,746 19	6,025 83	0 00
Texas	0 00	0.00	779.00	0.00	3,152,116 00	52,251.01	19,031.65	3,224,177.66	21.00
Utah	0 00	0 00	0 00	0 00	12,779 05	517 00	1,005 17	14,301 22	0 00
Washington	0 00	12 00	0 00	0 00	0.00	0 00	1,629.00	1,641.00	0.00
West Virginia	0 00	0 00	0 00	0 00	0 00	19 00	1 00	20 00	0 00
Wisconsin	0 00	0 00	0.00	0 00	0 00	0.00	635 00	635 00	0 00
Total	**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**

Note: Data are from Section 8 of Form R

The hazardous waste/solvent recovery industries had the second largest quantity of these chemicals in production-related waste in 2001, with over 1.7 million pounds. Over 98.4 percent (1.7 million pounds) of the hazardous waste/solvent recovery industries' quantity of these chemicals in production-related waste was treated on-site. The quantity released on- and off-site accounted for 1.3 percent (22,564 pounds) of these industries' total.

Three other industry sectors reported more than 10,000 pounds of these PBT chemicals in production-related waste in 2001. The textiles industry had 24,188 pounds, almost all as treatment off-site. The stone/clay/glass sector had 18,915 pounds, primarily burned for energy recovery on-site. The electrical equipment industry had 11,487 pounds, primarily released on- and off-site.

Projected Quantities of TRI Chemicals Managed in Waste, 2001-2003

TRI facilities expected to decrease the quantity of these PBT chemicals in production-related waste between 2001 and 2003 by 1.7 percent, from 8.2 million pounds to 8.1 million pounds (see Table 3-96). The projected decrease was expected to occur from 2001 to 2002, with almost no overall change from 2002 to 2003.

The decrease was projected to occur in treatment on- and off-site, quantity released on- and off-site

Table 3-94: TRI On-site and Off-site Releases, by Industry, 2001: Other PBTs

			On-site Releases							Off-site Releases	
					Underground Injection		On-site Land Releases				
SIC Code	Industry	Total Forms	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
22	Textiles	2	2 00	0 00	0 00	0 00	0 00	0 00	2 00	7,698 00	7,700 00
24	Lumber	21	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 10	0 10
28	Chemicals	64	53,678 91	453 74	20 00	0 02	302 00	196,324 50	250,779 17	608,280 00	859,059 17
30	Plastics	9	351 37	0 00	0 00	0 00	0 00	0 00	351 37	7,428 20	7,779 57
32	Stone/Clay/Glass	2	0 70	0 00	0 00	0 00	0 00	0 00	0 70	0 00	0 70
33	Primary Metals	5	4 85	0 00	0 00	0 00	0 00	736 00	740 85	23 65	764 50
36	Electrical Equip	11	6 72	0 00	0 00	0 00	0 00	6,675 00	6,681 72	9,309 50	15,991 22
37	Transportation Equip	4	959 00	0 00	0 00	0 00	0 00	0 00	959 00	673 00	1,632 00
--	Multiple codes 20-39	8	2 00	0 00	0 00	0 00	0 00	0 00	2 00	188 25	190 25
--	No codes 20-39	3	11 00	0 00	0 00	0 00	0 00	0 00	11 00	0 00	11 00
491/493	Electric Utilities	10	118 31	0 01	0 00	0 00	0 00	0 00	118 31	0 78	119 09
5169	Chemical Wholesale Distributors	1	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
7389/4953	Hazardous Waste/Solvent Recovery	28	138 54	9 68	3 48	0 00	18,704 97	0 00	18,856 67	3,702 59	22,559 26
	Total	**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**

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

and energy recovery off-site. Treatment on-site (the activity with the largest amounts) was projected to decrease by 1.9 percent from 2001 to 2003.

There was a large jump in the actual amounts of these chemicals in production-related waste from the prior year of 2000 to 2001, with a 75.9 increase from 4.7 million pounds to 8.2 million pounds.

Source Reduction

In 2001, 40 forms were filed reporting source reduction activities for these PBT chemicals (see Table 3-97). As noted in **Waste Management** in Chapter 1, source reduction—an activity that prevents the generation of waste—is preferred to waste management. These 40 forms represented 23.8 percent of all forms submitted for these PBT chemicals in 2001.

The most frequently reported source reduction activity for these PBT chemicals was good operating practices, with 16 forms. Other source reduction activities included process modifications (listed on 9 forms), spill and leak prevention (on 5 forms), and raw materials modifications (on 4 forms).

Table 3-95: Quantities of TRI Chemicals in Waste, by Industry, 2001: Other PBTs

		Recycled		Energy Recovery		Treated		Quantity Released On- and Off-site	Total Production-related Waste Managed	Non-production-related Waste Managed
SIC Code	Industry	On-site	Off-site	On-site	Off-site	On-site	Off-site			
		Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
22	Textiles	0 00	0 00	0 00	0.00	0.00	24,186.00	2 00	24,188 00	0 00
24	Lumber	0 10	0 00	0 00	0 20	0 10	1 36	0 10	1 86	0 00
28	Chemicals	5,408 00	1,680 00	350,779 00	3,317 00	5,110,984 00	65,200 90	863,540 05	6,400,908 95	12,384 33
30	Plastics	556 00	0 00	0 00	133 50	0 00	0 00	7,876 50	8,566 00	0 00
32	Stone/Clay/Glass	0 00	0 00	18,854 00	59 20	0 00	0 00	1 70	18,914 90	0 00
33	Primary Metals	0 00	0 00	0 00	0 00	0 00	506 08	764 50	1,270 58	0 00
36	Electrical Equip	0 00	323 00	0 00	1,437 00	3 00	408 00	9,316.22	11,487 22	0 00
37	Transportation Equip	0 00	0 00	0 00	0 00	0 00	80 00	1,631 00	1,711 00	0 00
--	Multiple codes 20-39	0 00	0 00	0 00	100 00	0 00	1,700 00	190 25	1,990 25	0 00
--	No codes 20-39	0 00	0 00	0 00	0 00	0 00	28 00	11 00	39 00	0 00
491/493	Electric Utilities	0 00	516.20	0.00	0 00	0 00	0 00	119 08	635 28	0 00
5169	Chemical Wholesale Distributors	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
7389/4953	Hazardous Waste/Solvent Recovery	0 00	5 80	446.64	1,504 40	1,699,485 75	2,830 04	22,563 51	1,726,836 14	0 00
	Total	**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**

Note: Data are from Section 8 of Form R

Table 3-96: Prior Year, Current Year and Projected Quantities of TRI Chemicals in Waste, 2000-2003: Other PBTs

Waste Management Activity	Prior Year 2000 Total Pounds	Prior Year 2000 Percent of Total	Current Year 2001 Total Pounds	Current Year 2001 Percent of Total	Projected 2002 Total Pounds	Projected 2002 Percent of Total	Projected 2003 Total Pounds	Projected 2003 Percent of Total
Recycled On-site	6,565 50	0 1	5,964.10	0 1	6,561.20	0.1	6,561.20	0 1
Recycled Off-site	12,977 00	0 3	2,525 00	0 0	2,247 00	0 0	3,327 00	0 0
Energy Recovery On-site	129,062.00	2 8	370,079.64	4.5	373,558 30	4 6	372,571.13	4 6
Energy Recovery Off-site	4,861 00	0 1	6,551 30	0 1	6,104 00	0 1	6,104 00	0 1
Treated On-site	3,656,627.27	78.5	6,810,472 85	83.1	6,682,400 15	83 0	6,682,586.15	82.9
Treated Off-site	26,774 64	0 6	94,940 38	1 2	88,732 67	1 1	89,192 68	1 1
Quantity Released On- and Off-site	823,598 74	17 7	906,015.92	11.1	894,892.35	11.1	897,376.43	11 1
Total Production-related Waste Managed	**4,660,466.15**	**100.0**	**8,196,549.19**	**100.0**	**8,054,495.68**	**100.0**	**8,057,718.59**	**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	-9 2	10.0	0 0	10.0
Recycled Off-site	-80 5	-11 0	48 1	31 8
Energy Recovery On-site	186 7	0 9	-0.3	0.7
Energy Recovery Off-site	34 8	-6 8	0 0	-6 8
Treated On-site	86 3	-1.9	0.0	-1.9
Treated Off-site	254 6	-6 5	0 5	-6 1
Quantity Released On- and Off-site	10 0	-1.2	0 3	-1 0
Total Production-related Waste Managed	**75.9**	**-1.7**	**0.04**	**-1.7**

Note: Data from Section 8 of Form R for 2001

On- and Off-site Releases, 2000-2001

On- and off-site releases of these PBT chemicals increased from 827,035 pounds to 915,807 pounds from 2000 to 2001, an increase of 88,772 pounds or 10.7 percent (see Table 3-98). This was due to an increase in off-site releases (transfers to disposal), which increased by 95,597 pounds, or 17.6 percent, mainly due to an increase in tetrabisphenol A of 87,932 pounds. On-site releases decreased, by 6,825 pounds or 2.4 percent.

The increase in off-site releases (transfers to disposal) of these PBT chemicals was primarily due to increases in transfers to landfills/surface impoundments. Such transfers increased by 97,950 pounds or 18.2 percent. There were also increases in on-site releases to RCRA subtitle C landfills. Such releases increased by 1,429 pounds or 8.1 percent.

Most of the other types of releases of these PBT chemicals decreased from 2000 to 2001. On-site air emissions decreased by 6,793 pounds or 10.9 percent. Other on-site land releases (that is, other than RCRA subtitle C landfills) decreased by 1,372 pounds, less than 1.0 percent.

Table 3-97: Number of Forms Reporting Source Reduction Activity, by Category, 2001: Other PBTs

CAS Number	Chemical	Total Form Rs Number	Forms Reporting Source Reduction Activity: Number	Forms Reporting Source Reduction Activity: Percent of All Form Rs Percent	Category of Source Reduction Activity: Good Operating Practices Number	Inventory Control Number	Spill and Leak Prevention Number	Raw Materials Modifications Number	Process Modifications Number	Cleaning and Degreasing Number	Surface Preparation and Finishing Number	Product Modifications Number
118-74-1	Hexachlorobenzene	99	20	20 2	7	2	4	0	5	1	0	1
29082-74-4	Octachlorostyrene	4	0	0 0	0	0	0	0	0	0	0	0
608-93-5	Pentachlorobenzene	17	1	5 9	1	0	0	0	0	0	0	0
79-94-7	Tetrabromobisphenol A	48	19	39 6	8	1	1	4	4	0	0	1
	Total	**168**	**40**	**23.8**	**16**	**3**	**5**	**4**	**9**	**1**	**0**	**2**

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

Table 3-98: TRI On-site and Off-site Releases, 2000-2001: Other PBTs

	2000	2001	Change 2000-2001	
	Number	Number	Number	Percent
Forms	173	168	-5	-2 9
	Pounds	Pounds	Pounds	Percent
Total Air Emissions	62,066.68	55,273.40	-6,793.27	-10.9
Surface Water Discharges	515 22	463 43	-51 79	-10.1
Underground Injection	60 29	23.50	-36.80	-61.0
Class I Wells	60 27	23 48	-36 79	-61 0
Class II-V Wells	0 02	0.02	-0 01	-28.6
On-site Land Releases	222,685 30	222,742 47	57 17	0 0
RCRA Subtitle C Landfills	17,578.20	19,006.97	1,428.77	8.1
Other On-site Land Releases	205,107 10	203,735 50	-1,371 60	-0 7
Total On-site Releases	**285,327.49**	**278,502.80**	**-6,824.69**	**-2.4**
Off-site Releases				
Storage Only*	0.00	0.00	0.00	--
Solidification/Stabilization** Metals and Metal Category Compounds Only	0 00	0 00	0 00	--
Wastewater Treatment (Excluding POTWs)*** Metals and Metal Category Compounds Only	0 00	0 00	0 00	--
Transfers to POTWs**** Metals and Metal Category Compounds Only	0 00	0 00	0 00	--
Underground Injection	0 00	0 00	0 00	--
Landfills/Surface Impoundments	538,434 34	636,383.93	97,949.59	18.2
Land Treatment	0 00	0 00	0 00	--
Other Land Disposal	670.00	303 00	-367.00	-54.8
Other Off-site Management	1,965 90	610 60	-1,355 30	-68 9
Transfers to Waste Broker for Disposal	601.00	0.10	-600.90	-100.0
Unknown*****	36 00	6 44	-29 56	-82 1
Total Off-site Releases (Transfers Off-site to Disposal)	**541,707.24**	**637,304.07**	**95,596.83**	**17.6**
Total On- and Off-site Releases	**827,034.73**	**915,806.87**	**88,772.14**	**10.7**

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 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)

Waste Management Data, 2000-2001

Quantities of TRI Chemicals in Waste, 2000-2001

The quantity of these PBT chemicals in production-related waste increased from 7.6 million pounds in 2000 to 8.2 million pounds in 2001, an increase of 8.1 percent (see Table 3-99). The amount treated on-site increased by 306,299 pounds or 4.7 percent and the amount burned for energy recovery on-site increased by 229,418 pounds or over 163 percent. The quantity released on- and off-site also increased, by 77,690 pounds or 9.4 percent, and the amount treated off-site increased by 66,130 pounds or 229.5 percent.

Decreases were reported in the amount of these PBT chemicals in waste burned for energy recovery off-site, a decrease of 51,883 pounds or 88.8 percent. The amount of these PBT chemicals in waste recycled off-site also decreased, by 9,915 pounds or 79.7 percent.

Table 3-99: Quantities of TRI Chemicals in Waste by Waste Management Activity, 2000-2001: Other PBTs

Waste Management Activity	2000 Pounds	2001 Pounds	Change 2000-2001 Pounds	Change 2000-2001 Percent
Recycled On-site	6,605.50	5,964.10	-641.40	-9.7
Recycled Off-site	12,440 00	2,525 00	-9,915 00	-79 7
Energy Recovery On-site	140,662.00	370,079.64	229,417 64	163.1
Energy Recovery Off-site	58,433 80	6,551 30	-51,882 50	-88 8
Treated On-site	6,504,174.17	6,810,472.85	306,298.68	4 7
Treated Off-site	28,810 36	94,940 38	66,130 02	229 5
Quantity Released On- and Off-site	828,325.47	906,015 92	77,690.45	9 4
Total Production-related Waste Managed	**7,579,451.30**	**8,196,549.19**	**617,097.89**	**8.1**
Non-production-related Waste Managed	22,917.37	12,384.33	-10,533.04	-46.0

Note: Data are from Section 8 of Form R of year indicated

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

As shown in Table 3-100, transfers off-site for further waste management, including disposal, of these PBT chemicals increased from 2000 to 2001, by 63,359 pounds or 9.4 percent. Other off-site transfers to disposal increased by 91,676 pounds or 16.6 percent. The amount of these PBT chemicals in waste sent for treatment off-site also increased, by 35,167 pounds or 75.0 percent.

Decreases were reported in the amount of these PBT chemicals in transfers to energy recovery. Such transfers decreased by 51,894 pounds, a decrease of 88.7 percent. Transfers to recycling of these PBT chemicals also decreased from 2000 to 2001, by 11,608 pounds or 84.0 percent.

Table 3-100: TRI Transfers Off-site for Further Waste Management, including Disposal, 2000-2001: Other PBTs

	2000 Pounds	2001 Pounds	Change 2000-2001 Pounds	Change 2000-2001 Percent
Transfers to Recycling	13,822.00	2,214.02	-11,607.98	-84.0
Transfers to Energy Recovery	58,496 90	6,603 00	-51,893 90	-88 7
Transfers to Treatment	46,890.31	82,057.37	35,167 06	75.0
Transfers to POTWs	11 66	29.90	18 24	156 4
Metals and Metal Category Compounds Only	0.00	0.00	0 00	--
Non-metal TRI Chemicals	11 66	29 90	18 24	156 4
Other Off-site Transfers*	0.00	0.10	0.10	--
Other Off-site Transfers to Disposal**	552,594 24	644,269 81	91,675 57	16 6
Total Transfers for Further Waste Management, including Disposal	**671,815.11**	**735,174.19**	**63,359.08**	**9.4**

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

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Pesticides

U.S. Environmental Protection Agency, Office of Environmental Information (OEI), August 2000. "2000 Toxics Release Inventory Public Data Release Report" (EPA 260-R-02-003).

Other PBT Chemicals

U.S. Environmental Protection Agency, Office of Environmental Information (OEI), August 2000. "2000 Toxics Release Inventory Public Data Release Report" (EPA 260-R-02-003).

Appendix A

Chemical-specific TRI Release and Other Waste Management Data, 1998-2001

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	On-site Releases: Surface Water Discharges Pounds	On-site Releases: Underground Injection Pounds	On-site Releases: Releases to Land Pounds	On-site Releases: Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
71751-41-2	*	Abamectin	98	3	1	250	0	0	251	0	251
			99	3	1	250	0	0	251	0	251
			00	3	20	15	0	0	35	0	35
			01	3	20	13	0	0	33	0	33
30560-19-1	*	Acephate	98	7	1,775	0	0	0	1,775	0	1,775
			99	7	645	0	0	0	645	0	645
			00	6	959	0	0	0	959	7,200	8,159
			01	6	1,057	0	0	0	1,057	12,300	13,357
75-07-0	*,**	Acetaldehyde	98	278	12,535,135	193,995	531,693	21,562	13,282,385	5,916	13,288,301
			99	286	12,073,593	229,225	754,277	20,589	13,077,684	4,402	13,082,086
			00	298	12,343,637	194,393	1,079,397	22,607	13,640,034	3,782	13,643,816
			01	295	11,899,549	157,502	670,533	23,130	12,750,714	3,487	12,754,201
60-35-5	**	Acetamide	98	12	169	1	2,157,694	25,474	2,183,338	10	2,183,348
			99	12	158	1	2,452,733	0	2,452,892	2	2,452,894
			00	11	159	2	2,977,410	0	2,977,571	0	2,977,571
			01	12	427	2	1,076,766	0	1,077,195	0	1,077,195
75-05-8		Acetonitrile	98	133	1,033,895	28,862	21,974,093	33	23,036,883	65,054	23,101,937
			99	135	885,478	14,032	19,537,458	223	20,437,191	711,972	21,149,163
			00	130	743,838	16,533	22,536,234	592	23,297,197	64,786	23,361,983
			01	142	925,437	12,603	15,018,332	172	15,956,544	7,741	15,964,285
98-86-2	*	Acetophenone	98	52	171,621	655	734,007	0	906,283	49,744	956,027
			99	48	178,008	700	689,828	0	868,536	35,160	903,696
			00	54	153,587	441	718,192	266	872,486	33,577	906,063
			01	39	158,799	396	765,440	250	924,885	53,795	978,680
53-96-3	**	2-Acetylamino-fluorene	98	1	110	0	0	8,500	8,610	1,205	9,815
			99	4	139	1	0	38,197	38,337	20,648	58,985
			00	4	275	0	5	12,690	12,970	467	13,437
			01	5	1,445	0	5	49,468	50,918	29,628	80,546
62476-59-9	*	Acifluorfen, sodium salt	98	4	476	2,193	0	17	2,686	421,514	424,200
			99	4	315	4,757	0	0	5,072	222,680	227,752
			00	4	332	5,811	0	0	6,143	225,664	231,807
			01	7	224	4,584	0	0	4,808	11,360	16,168
107-02-8	*	Acrolein	98	29	184,134	270	95,900	1,351	281,655	665	282,320
			99	29	204,777	255	170,950	429	376,411	139	376,550
			00	30	208,108	643	201,020	404	410,175	410	410,585
			01	34	251,223	177	294,270	0	545,670	2	545,672
79-06-1	*,**	Acrylamide	98	84	23,472	2,272	6,333,564	0	6,359,308	6,961	6,366,269
			99	90	24,874	370	7,510,853	6,289	7,542,386	6,144	7,548,530
			00	86	14,786	160	8,639,361	4	8,654,311	10,733	8,665,044
			01	86	10,219	140	7,533,641	9,035	7,553,035	11,411	7,564,446
79-10-7		Acrylic acid	98	209	322,592	6,973	4,499,644	48,696	4,877,905	87,661	4,965,566
			99	210	366,538	6,735	2,630,949	1,030	3,005,252	220,111	3,225,363
			00	213	367,591	6,074	863,693	1,231	1,238,589	122,212	1,360,801
			01	211	364,144	4,436	4,085,900	348	4,454,828	54,335	4,509,163
107-13-1	*,**	Acrylonitrile	98	116	1,148,708	1,100	4,005,290	321	5,155,419	9,071	5,164,490
			99	117	985,281	1,173	4,462,492	23,804	5,472,750	98,418	5,571,168
			00	116	951,416	1,241	3,957,790	115,398	5,025,845	323,973	5,349,818
			01	118	935,855	924	10,216,942	133,191	11,286,912	189,566	11,476,478

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
* Abamectin	98	0	0	0	0	6,230	4,165	28	10,423	0
	99	0	0	0	0	4,918	3,589	23	8,530	0
	00	0	0	0	0	3,341	1,848	90	5,279	0
	01	0	0	0	0	2,910	1,654	33	4,597	0
* Acephate	98	90	0	0	0	9,800	12,683	2,186	24,759	0
	99	70	0	0	0	7,500	17,922	426	25,918	0
	00	130	0	0	0	28,463	17,857	515	46,965	0
	01	207	0	0	0	31,900	33,364	624	66,095	0
*,** Acetaldehyde	98	14,000	694	10,343,401	13,232,082	17,269,881	1,672,948	13,357,576	55,890,582	1,163
	99	17,183	1,460	14,666,967	246,178	23,454,370	1,431,358	13,091,548	52,909,064	125
	00	15,148	70,161	27,405,658	342,307	26,494,832	1,953,134	13,655,048	69,936,288	569
	01	14,172	379	27,480,883	228,370	25,470,158	2,150,012	12,762,654	68,106,628	42,105
** Acetamide	98	0	0	81,220	62,087	90,563	362	2,183,308	2,417,540	0
	99	0	0	80,637	44,923	166,644	575	2,452,889	2,745,668	0
	00	0	0	83,297	42,385	21,718	2,766	2,978,060	3,128,226	0
	01	0	0	65,582	10,138	35,707	43,506	1,077,099	1,232,032	0
Acetonitrile	98	13,140,578	1,880,831	20,420,834	11,558,875	21,243,933	8,021,273	24,199,286	100,465,610	1,027
	99	12,656,086	2,000,134	41,533,791	13,049,202	23,246,983	8,685,076	21,252,844	122,424,116	74
	00	11,558,433	1,952,069	30,165,449	14,907,281	23,733,077	7,157,973	23,373,445	112,847,727	390
	01	12,599,449	2,939,339	24,813,686	19,714,337	29,425,950	5,015,359	20,772,860	115,280,980	2,560
* Acetophenone	98	0	3,448	32,071,882	1,415,197	856,740	161,672	963,965	35,472,904	0
	99	0	3,683	33,367,740	1,435,519	961,217	178,690	920,846	36,867,695	5
	00	0	14,741	30,480,564	10,908,265	1,056,295	129,001	943,861	43,532,727	0
	01	0	10,405	35,537,021	8,239,060	906,555	170,871	1,015,566	45,879,478	22
** 2-Acetylamino-fluorene	98	0	0	0	0	310	41	9,800	10,151	0
	99	0	0	0	0	99,902	0	58,981	158,883	0
	00	0	0	0	0	84,933	781	13,436	99,150	0
	01	0	5,573	330	14,754	96,146	17,297	80,701	214,801	0
* Acifluorfen, sodium salt	98	0	0	0	0	13,105	3,237	423,965	440,307	0
	99	0	0	0	0	45,498	1,891	227,507	274,896	0
	00	0	0	0	0	5,929	2,304	231,538	239,771	5
	01	0	0	0	0	287,704	197,691	16,191	501,586	0
* Acrolein	98	0	0	3,712,551	38,933	16,430,612	12	278,469	20,460,577	194
	99	0	0	4,878,507	176,954	8,581,456	211	365,014	14,002,142	16
	00	0	0	11,790,188	67,678	3,422,820	140,068	394,272	15,815,026	306
	01	0	0	3,140,047	204,634	4,594,724	367	545,263	8,485,035	88
*,** Acrylamide	98	162	0	90,200	234,769	222,498	311,267	6,364,139	7,223,035	49,723
	99	3	0	94,233	61,662	282,769	279,156	7,546,607	8,264,430	0
	00	27	0	82,504	19,012	385,662	180,993	8,656,126	9,324,324	7,000
	01	44	0	100,650	20,590	404,767	309,335	7,560,932	8,396,318	45,101
Acrylic acid	98	4,863,156	101,540	31,352,060	6,575,155	24,621,308	2,086,542	4,959,240	74,559,001	6,993
	99	4,680,911	52,220	20,853,278	6,360,743	33,402,345	1,201,706	3,236,560	69,787,763	111,051
	00	4,228,023	720	28,231,405	5,637,355	29,119,546	2,240,863	1,401,643	70,859,555	1,123
	01	1,000,969	17	29,896,179	5,080,780	27,193,468	1,949,498	4,517,565	69,638,476	178
*,** Acrylonitrile	98	12,827,695	190	4,841,082	182,829	11,314,070	2,392,222	5,132,207	36,690,295	2,373
	99	12,435,645	0	3,909,625	263,070	12,182,578	1,759,323	8,520,217	39,070,458	81,963
	00	9,094,814	0	6,411,967	323,000	14,345,238	797,930	4,897,616	35,870,565	109,038
	01	8,759,657	0	5,765,237	257,369	18,307,434	691,461	11,213,898	44,995,056	5,258

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
15972-60-8	*	Alachlor	98	5	1,564	220	0	0	1,784	9,713	11,497
			99	5	797	390	0	0	1,187	1,925	3,112
			00	6	1,373	7	0	0	1,380	5,167	6,547
			01	6	766	10	0	0	776	830	1,606
116-06-3	*	Aldicarb	98	5	155	0	0	15	170	0	170
			99	6	177	0	0	256	433	156	589
			00	6	185	0	0	5	190	0	190
			01	5	161	0	0	4	165	0	165
309-00-2	*	Aldrin	98	3	307	7	0	22,000	22,314	3,308	25,622
			99	1	0	0	0	0	0	0	0
		Not comparable	00	11	0.79	0.00	0.00	2,342.00	2,342.79	2.58	2,345.37
		to prior years***	01	8	0.31	0.00	0.00	0.00	0.31	1.07	1.38
28057-48-9		d-trans-Allethrin	98	1	0	0	0	0	0	0	0
			99	1	0	0	0	0	0	0	0
			00	1	0	0	0	0	0	0	0
			01	2	0	0	0	0	0	0	0
107-18-6	*	Allyl alcohol	98	36	262,464	9,688	463,854	0	736,006	16	736,022
			99	34	263,689	5,041	599,946	755	869,431	16,223	885,654
			00	35	379,146	6,067	526,618	5	911,836	7	911,843
			01	39	125,458	13,377	607,484	54	746,373	505	746,878
107-11-9		Allylamine	98	3	951	40	0	0	991	0	991
			99	3	1,040	450	0	0	1,490	0	1,490
			00	3	1,060	2,500	0	0	3,560	0	3,560
			01	3	1,114	0	0	0	1,114	0	1,114
107-05-1		Allyl chloride	98	26	70,900	5	0	2	70,907	1,724	72,631
			99	30	79,490	26	0	8,189	87,705	6,112	93,817
			00	28	146,993	541	0	0	147,534	3,880	151,414
			01	28	35,150	15	0	0	35,165	2,711	37,876
7429-90-5	*	Aluminum	98	347	1,486,258	3,898	5	5,660,455	7,150,616	7,564,170	14,714,786
		(fume or dust)	99	352	1,763,716	5,023	0	5,959,493	7,728,232	14,544,546	22,272,778
			00	358	1,530,399	4,798	0	11,368,208	12,903,405	8,655,239	21,558,644
			01	351	1,297,306	8,333	0	9,083,363	10,389,002	6,988,074	17,377,075
1344-28-1		Aluminum oxide	98	66	26,807	750	0	15,603,760	15,631,317	2,994,534	18,625,851
		(fibrous forms)	99	63	112,183	756	0	30,751,294	30,864,233	3,186,848	34,051,081
			00	70	137,521	558	8,449	42,491,089	42,637,617	3,631,728	46,269,345
			01	65	46,992	804	305	3,995,600	4,043,701	6,740,171	10,783,872
20859-73-8	*	Aluminum	98	2	0	0	0	0	0	0	0
		phosphide	99	4	4	0	0	0	4	153	157
			00	2	0	0	0	0	0	0	0
			01	1	0	0	0	0	0	0	0
834-12-8	*	Ametryn	98	5	1,168	51	0	0	1,219	0	1,219
			99	4	1,460	16	0	0	1,476	0	1,476
			00	4	1,310	12	0	0	1,322	0	1,322
			01	5	1,851	11	0	0	1,862	0	1,862
117-79-3	**	2-Aminoanthra-	98	No reports							
		quinone	99	No reports							
			00	No reports							
			01	No reports							

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)

No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

*** Data for PBT chemicals, due to threshold change for 2000 reporting year, are not comparable to prior year reporting See Chapter 3 for more information

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

	Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
*	Alachlor	98	0	0	0	0	82,244	181,800	11,013	275,057	0
		99	0	0	0	0	272,537	139,100	2,598	414,235	0
		00	0	0	0	0	125,646	96,135	6,471	228,252	0
		01	0	0	0	0	102,105	114,732	667	217,504	0
*	Aldicarb	98	0	0	0	0	17,135	40,611	150	57,896	10
		99	0	0	0	0	171,255	19,953	328	191,536	0
		00	0	0	0	0	152,904	28,524	180	181,608	0
		01	0	0	0	0	85,751	9,220	156	95,127	0
*	Aldrin	98	0	0	0	1	77,986	110	26,045	104,142	0
		99	0	0	0	0	53,598	0	0	53,598	0
	Not comparable	00	0.00	0.00	0.00	0.00	82,504.75	283.00	2,345.32	85,133.07	0.00
	to prior years***	01	0.00	0.00	0.00	306.00	58,529.00	24.00	18.38	58,877.38	0.00
	d-trans-Allethrin	98	0	0	0	0	0	0	0	0	0
		99	0	0	0	0	0	0	0	0	0
		00	0	0	0	0	0	0	0	0	0
		01	0	0	0	0	0	419	0	419	0
*	Allyl alcohol	98	248,764	0	1,413,165	1,229,919	1,233,832	173,575	693,505	4,992,760	0
		99	340,364	0	1,844,591	1,074,820	4,164,724	195,126	836,160	8,455,785	750
		00	2,798,933	0	2,012,131	508,062	1,945,221	1,382,106	904,897	9,551,350	0
		01	2,290,496	0	4,668,018	1,207,443	2,474,377	911,190	746,317	12,297,841	0
	Allylamine	98	0	0	0	5	380	0	991	1,376	0
		99	0	0	0	1	4,000	0	1,274	5,275	0
		00	0	0	0	0	22,000	0	3,304	25,304	0
		01	0	0	0	0	28,800	0	1,078	29,878	0
	Allyl chloride	98	780,000	68,000	5,349,016	321,228	370,936	195,216	71,009	7,155,405	1
		99	23,000	44,000	157,078	236,934	494,159	649,453	91,616	1,696,240	1,000
		00	650,000	82,000	5,335,210	226,011	4,019,560	193,380	205,785	10,711,946	45
		01	170,423	110,000	6,103,884	248,855	1,829,379	320,527	36,353	8,819,421	1,106
*	Aluminum	98	15,724,778	30,018,801	0	4,267	18,514,372	176,584	14,465,394	78,904,196	40,280
	(fume or dust)	99	15,586,205	28,635,504	0	5,058	22,030,241	552,882	20,917,251	87,727,141	10
		00	17,261,275	20,059,823	0	3,954	22,912,090	608,198	20,941,564	81,786,903	0
		01	5,996,088	21,267,827	0	628	20,598,920	486,721	16,903,098	65,253,282	7,703
	Aluminum oxide	98	7,716,545	267,471	0	0	46,453	1,671,168	17,631,736	27,333,373	0
	(fibrous forms)	99	12,612,154	497,988	0	1,111	909,607	1,244,196	33,608,202	48,873,258	0
		00	13,283,176	407,915	0	1,946	208,614	816,517	45,553,967	60,272,135	17
		01	107,920	69,691	0	831	93,024	626,100	9,998,656	10,896,222	7,937
*	Aluminum	98	0	0	0	0	0	0	0	0	0
	phosphide	99	0	0	0	0	66,262	0	28,100	94,362	0
		00	0	0	0	0	35,975	0	0	35,975	0
		01	0	0	0	0	20,396	0	0	20,396	0
*	Ametryn	98	25	0	0	0	120,083	85,000	592	205,700	0
		99	25	0	0	0	46,079	12,000	801	58,905	0
		00	25	0	0	0	19,006	9,402	660	29,093	0
		01	25	0	0	0	58,018	43,172	1,182	102,397	0
**	2-Aminoanthra-	98	No reports								
	quinone	99	No reports								
		00	No reports								
		01	No reports								

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

*** Data for PBT chemicals, due to threshold change for 2000 reporting year, are not comparable to prior year reporting See Chapter 3 for more information

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	On-site Releases: Surface Water Discharges Pounds	On-site Releases: Underground Injection Pounds	On-site Releases: Releases to Land Pounds	On-site Releases: Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
60-09-3	**	4-Aminoazo-benzene	98	2	0	0	124	0	124	0	124
			99	2	0	0	287	0	287	0	287
			00	1	0	0	175	0	175	0	175
			01	1	0	0	59	0	59	0	59
92-67-1	**	4-Aminobiphenyl	98	1	0	0	0	0	0	0	0
			99	1	0	0	13	0	13	0	13
			00	1	1	0	47	0	48	0	48
			01	1	0	0	16	0	16	0	16
82-28-0	**	1-Amino-2-methyl-anthraquinone	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
33089-61-1	*	Amitraz	98	No reports							
			99	1	0	0	0	0	0	0	0
			00	1	0	0	0	0	0	0	0
			01	1	0	0	0	0	0	0	0
61-82-5	*,**	Amitrole	98	2	1	0	0	0	1	0	1
			99	3	7	1	0	0	8	168	176
			00	3	5	0	0	0	5	5	10
			01	3	5	0	0	0	5	260	265
7664-41-7	*	Ammonia	98	3,023	161,991,320	7,791,996	24,650,960	4,426,133	198,860,409	2,091,346	200,951,755
			99	2,915	155,150,562	7,637,790	26,245,785	6,736,992	195,771,129	3,342,199	199,113,328
			00	2,842	140,401,810	7,644,522	27,335,270	5,782,050	181,163,652	4,411,943	185,575,595
			01	2,672	122,057,546	6,621,166	22,974,237	3,621,049	155,273,998	3,247,048	158,521,046
101-05-3	*	Anilazine	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
62-53-3	*	Aniline	98	81	217,213	19,549	1,161,911	252	1,398,925	26,880	1,425,805
			99	80	176,799	15,783	533,803	1,013	727,398	55,823	783,221
			00	81	195,280	12,704	762,097	297	970,378	217,270	1,187,648
			01	76	162,114	4,571	992,953	8,896	1,168,534	157,059	1,325,593
90-04-0	**	o-Anisidine	98	7	1,373	39	0	0	1,412	2	1,414
			99	7	1,587	14	0	0	1,601	1	1,602
			00	5	724	0	0	0	724	0	724
			01	6	856	0	0	0	856	0	856
104-94-9		p-Anisidine	98	1	45	0	0	0	45	0	45
			99	No reports							
			00	No reports							
			01	No reports							
134-29-2	**	o-Anisidine hydrochloride	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
120-12-7		Anthracene	98	80	57,867	580	0	3,564	62,011	69,966	131,977
			99	80	78,173	515	0	169,504	248,192	79,562	327,754
			00	84	29,399	1,016	0	171	30,586	53,774	84,360
			01	89	46,590	6,631	0	329	53,550	63,214	116,764

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
** 4-Aminoazo-benzene	98	0	0	0	0	0	74	124	198	0
	99	0	0	0	0	0	67	287	354	0
	00	0	0	0	0	0	31	175	206	0
	01	0	0	0	0	0	103	59	162	0
** 4-Aminobiphenyl	98	0	0	0	0	98,000	810	0	98,810	0
	99	0	0	0	0	124,926	48	13	124,987	0
	00	0	0	182,587	0	22	32	48	182,689	0
	01	0	0	124,917	0	24	124	16	125,081	0
** 1-Amino-2-methyl-anthraquinone	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
* Amitraz	98	No reports								
	99	0	0	0	0	0	0	0	0	0
	00	0	0	0	0	0	0	0	0	0
	01	0	0	0	0	0	0	0	0	0
*,** Amitrole	98	0	0	0	0	22,788	0	1	22,789	0
	99	0	0	0	0	205,239	0	170	205,409	0
	00	0	0	0	0	170,032	797	8	170,837	0
	01	0	0	330	1,491	189,084	83	29	191,017	0
* Ammonia	98	350,105,864	10,442,198	103,213,467	247,676	289,148,461	17,317,450	204,965,014	975,440,130	573,917
	99	210,791,274	7,773,129	89,129,210	144,378	325,889,568	16,426,797	199,481,783	849,636,139	518,976
	00	182,971,584	8,604,728	102,193,016	239,835	291,447,019	16,473,543	185,689,525	787,619,250	738,506
	01	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
* Anilazine	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
* Aniline	98	7,549,987	2	8,579,301	2,958,124	4,449,242	3,843,204	1,445,654	28,825,514	6,698
	99	9,876,710	0	7,785,942	2,364,390	3,887,606	3,625,271	769,520	28,309,439	8,993
	00	8,479,315	0	7,880,424	2,094,318	4,093,763	4,282,696	1,194,841	28,025,357	331
	01	3,270,921	0	7,993,205	1,230,618	3,673,459	2,393,801	1,336,669	19,898,673	8,887
** o-Anisidine	98	0	0	2,756	0	991	5,176	1,413	10,336	0
	99	0	0	2,398	0	376	7,083	1,602	11,459	0
	00	0	0	1,182	0	0	1,983	724	3,889	0
	01	0	0	1,167	0	0	0	856	2,023	0
p-Anisidine	98	0	0	0	0	61	0	45	106	0
	99	No reports								
	00	No reports								
	01	No reports								
** o-Anisidine hydrochloride	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
Anthracene	98	303,857	33,806	53,554	97,248	144,092	63,204	131,882	827,643	0
	99	599,528	30,265	127,242	162,322	306,581	25,279	331,251	1,582,468	0
	00	651,688	14,107	180,509	103,206	702,497	108,542	82,491	1,843,040	288
	01	928,336	47,542	2,193,329	64,119	507,916	22,837	105,912	3,869,991	5,205

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
7440-36-0		Antimony	98	133	7,125	14,518	18,994	1,256,992	1,297,629	406,154	1,703,783
			99	134	10,878	13,755	0	767,428	792,061	351,554	1,143,615
			00	134	21,412	17,401	0	172,044	210,857	208,524	419,381
			01	124	15,800	13,252	0	770,570	799,622	603,911	1,403,533
--		Antimony compounds	98	648	85,222	55,571	181,360	24,715,586	25,037,739	3,718,778	28,756,517
			99	657	131,735	62,728	672,997	28,181,551	29,049,011	3,322,130	32,371,141
			00	655	98,162	63,713	710,204	24,567,658	25,439,737	3,633,770	29,073,506
			01	592	78,622	67,267	717,011	20,335,553	21,198,453	3,080,509	24,278,962
7440-38-2	**	Arsenic	98	85	56,902	1,837	269,393	76,488,574	76,816,706	306,502	77,123,208
			99	78	6,495	1,052	250	35,721,696	35,729,493	477,819	36,207,312
			00	81	3,584	1,330	138,358	1,135,813	1,279,085	281,247	1,560,332
			01	67	1,814	1,445	0	778,933	782,192	203,878	986,070
--	**	Arsenic compounds	98	556	299,933	165,520	933,175	556,685,687	558,084,315	2,143,123	560,227,438
			99	532	287,691	183,746	1,078,344	568,842,367	570,392,148	3,137,309	573,529,457
			00	544	238,639	166,667	1,809,735	469,079,131	471,294,172	4,985,114	476,279,287
			01	525	177,832	141,172	1,531,741	376,234,926	378,085,671	3,000,912	381,086,583
1332-21-4	*,**	Asbestos (friable)	98	81	2,452	1	0	14,137,869	14,140,322	8,252,294	22,392,616
			99	87	3,182	0	0	13,573,597	13,576,779	4,657,243	18,234,022
			00	85	2,536	1	0	21,184,513	21,187,050	3,258,483	24,445,533
			01	72	1,679	5	0	18,362,719	18,364,403	2,181,012	20,545,415
1912-24-9	*	Atrazine	98	28	30,983	2,756	336	628,143	662,218	19,470	681,688
			99	28	20,946	1,212	172	643,912	666,242	22,928	689,170
			00	27	22,513	1,034	198	501,732	525,477	74,734	600,211
			01	28	24,872	934	535	510,160	536,501	215,476	751,977
7440-39-3		Barium	98	127	149,988	148,457	25,000	9,514,566	9,838,011	1,797,402	11,635,413
			99	110	164,777	57,412	24,153	5,948,717	6,195,059	2,329,711	8,524,770
			00	107	252,128	21,113	70,254	10,030,788	10,374,284	1,838,164	12,212,448
			01	106	603,986	17,162	20,000	5,769,290	6,410,438	1,764,267	8,174,705
--		Barium compounds	98	1,150	3,159,928	2,106,354	1,321,650	177,353,199	183,941,131	44,501,791	228,442,922
			99	1,132	3,229,858	2,176,237	1,982,918	252,557,257	259,946,270	42,792,467	302,738,737
			00	1,119	2,814,554	1,744,849	2,099,443	243,461,575	250,120,421	49,505,315	299,625,736
			01	1,088	2,163,853	1,475,918	1,980,947	201,019,832	206,640,550	45,504,419	252,144,968
22781-23-3	*	Bendiocarb	98	4	5	0	0	0	5	10	15
			99	4	16	0	0	0	16	10	26
			00	5	1	0	0	0	1	0	1
			01	2	0	0	0	0	0	0	0
1861-40-1	*	Benfluralin	98	8	1,564	0	0	0	1,564	3	1,567
			99	9	1,231	0	0	0	1,231	5	1,236
			00	6	750	0	0	0	750	0	750
			01	7	400	0	0	0	400	3,970	4,370
17804-35-2	*	Benomyl	98	4	11	0	0	0	11	5	16
			99	5	7	0	0	0	7	254	261
			00	4	6	0	0	0	6	0	6
			01	4	11	0	0	0	11	505	516
98-87-3		Benzal chloride	98	6	418	0	0	0	418	0	418
			99	4	410	0	0	0	410	22	432
			00	6	487	0	0	0	487	18	505
			01	6	365	0	0	0	365	506	871

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information) For arsenic compounds, applies only to inorganic arsenic compounds

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
Antimony	98	4,625,143	738,488	30,405	66,692	308,925	90,259	1,632,900	7,492,812	6
	99	5,276,182	1,189,949	0	0	351,900	108,507	1,027,495	7,954,033	3
	00	4,372,208	1,459,586	0	0	434,428	70,601	335,345	6,672,168	260
	01	5,901,927	1,815,061	0	0	602	44,441	1,346,082	9,108,113	5,813
Antimony compounds	98	4,895,580	4,169,988	6,820	16,879	582,993	499,196	28,413,129	38,584,585	143,125
	99	5,072,859	3,817,162	0	53,103	470,337	483,870	31,688,143	41,585,474	530,326
	00	4,508,161	4,950,360	0	17,821	480,197	287,874	28,803,996	39,048,409	187,887
	01	4,518,467	2,159,095	0	10,353	113,978	68,517	23,899,921	30,770,331	355,562
** Arsenic	98	3,946,422	185,974	0	0	125,485	20,091	77,187,391	81,465,363	2,533
	99	1,502,341	710,558	0	0	74,034	115,583	36,478,719	38,881,235	1,171
	00	1,017,227	128,637	0	0	79,533	15,200	1,688,740	2,929,337	36,685
	01	1,049,122	52,856	0	0	0	40	995,511	2,097,529	727
** Arsenic compounds	98	2,588,312	859,137	0	1	112,182	128,977	559,267,261	562,955,870	2,154,043
	99	3,590,875	1,084,216	300	0	61,122	202,776	570,383,449	575,322,738	7,638,781
	00	3,884,343	463,946	0	0	4,142	323,638	470,654,905	475,330,974	3,315,226
	01	5,676,289	439,803	0	0	20,476	28,566	379,423,693	385,588,827	1,899,930
*,** Asbestos (friable)	98	252,323	150	0	0	1,241,569	362	20,045,569	21,539,973	2,206,595
	99	178,509	145	0	0	643,303	3,802	16,576,382	17,402,141	364,000
	00	62,442	0	0	0	184,155	35,652	24,177,077	24,459,326	0
	01	46,667	0	0	0	110,225	58,818	20,448,581	20,664,291	14,960
* Atrazine	98	250	0	0	0	923,252	213,489	689,770	1,826,761	251
	99	2,250	0	0	0	656,978	190,905	723,859	1,573,992	250
	00	78,625	0	0	0	628,213	195,934	604,533	1,507,305	16,060
	01	77,563	0	0	0	807,372	102,256	740,065	1,727,256	0
Barium	98	164,381	500,853	601,788	418	775,954	409,804	11,568,259	14,021,457	650
	99	193,181	889,706	0	0	1,211,119	272,744	7,960,756	10,527,506	10
	00	254,216	1,759,673	57,134	0	24,520	108,214	11,968,665	14,172,423	2,139,911
	01	193,567	543,885	58,814	0	24,721	600	7,676,346	8,497,933	917
Barium compounds	98	35,755,872	7,238,454	19,138	116,789	5,926,805	2,114,681	227,529,725	278,701,464	24,641
	99	32,533,201	5,466,349	6,000	139,668	5,052,078	1,088,923	305,598,031	349,884,250	25,391
	00	35,805,189	5,692,321	0	11,818	5,581,764	1,941,012	299,385,974	348,418,078	50,376
	01	51,277,953	4,227,986	0	7,106	7,899,459	647,597	253,313,765	317,373,866	2,087,659
* Bendiocarb	98	0	0	0	0	0	580	30	610	0
	99	0	0	0	0	56,392	581	11	56,984	0
	00	0	0	0	0	13,974	1,242	1	15,217	0
	01	0	0	0	0	0	0	0	0	0
* Benfluralin	98	79,000	0	0	0	31	897	1,347	81,275	0
	99	87,000	0	0	0	0	335	1,223	88,558	0
	00	4,600	0	0	0	0	0	751	5,351	0
	01	4,700	0	0	0	0	0	4,374	9,074	0
* Benomyl	98	0	0	45,000	65,600	115,574	20,263	21	246,458	0
	99	0	0	0	107,108	45,752	16,128	23	169,011	0
	00	0	0	0	42,029	30,674	5,492	6	78,201	0
	01	0	0	0	29,000	24,556	6,130	438	60,124	0
Benzal chloride	98	0	0	0	120,000	319,247	200	420	439,867	0
	99	0	0	0	550,000	759,990	74	433	1,310,497	0
	00	0	0	0	1,100,000	1,358,924	1,018	494	2,460,436	0
	01	0	0	480	511,491	778,213	790	887	1,291,861	0

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information) For arsenic compounds, applies only to inorganic arsenic compounds

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	On-site Releases: Surface Water Discharges Pounds	On-site Releases: Underground Injection Pounds	On-site Releases: Releases to Land Pounds	On-site Releases: Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
55-21-0		Benzamide	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
71-43-2	*,**	Benzene	98	1,018	7,701,546	18,877	570,806	240,262	8,531,491	195,654	8,727,145
			99	994	7,707,644	27,844	840,628	143,864	8,719,980	149,419	8,869,399
			00	1,002	6,992,437	13,871	620,250	50,901	7,677,459	47,224	7,724,683
			01	1,012	5,894,659	21,130	217,948	81,200	6,214,937	141,323	6,356,260
92-87-5	**	Benzidine	98	4	38	0	0	0	38	0	38
			99	6	13	0	0	0	13	165	178
			00	6	12	0	0	0	12	10	22
			01	4	17	255	0	0	272	260	532
98-07-7	**	Benzoic trichloride	98	8	2,255	0	0	0	2,255	440	2,695
			99	10	2,184	0	0	0	2,184	572	2,756
			00	6	1,846	0	0	0	1,846	300	2,146
			01	8	613	0	0	0	613	631	1,244
191-24-2	***	Benzo(g,h,i) perylene	98	NR	NR	NR	NR	NR	NR	NR	NR
			99	NR	NR	NR	NR	NR	NR	NR	NR
			00	1,427	40,723.30	554.83	0.00	6,152.68	47,430.81	116,706.21	164,137.03
			01	1,509	31,455.26	685.17	2.65	8,569.61	40,712.69	86,240.63	126,953.32
98-88-4		Benzoyl chloride	98	26	11,993	0	0	0	11,993	3,980	15,973
			99	24	10,425	0	0	0	10,425	2,393	12,818
			00	23	11,124	0	0	0	11,124	2,006	13,130
			01	24	9,377	0	0	0	9,377	900	10,277
94-36-0	*	Benzoyl peroxide	98	67	803	250	0	736	1,789	6,046	7,835
			99	63	251	250	0	117	618	5,425	6,043
			00	63	2,658	250	0	60	2,968	16,321	19,289
			01	62	2,767	250	0	5,351	8,368	10,607	18,975
100-44-7		Benzyl chloride	98	48	26,929	597	150	261	27,937	4,507	32,444
			99	44	26,301	1,208	270	214	27,993	1,437	29,430
			00	39	19,048	87	450	263	19,848	3,043	22,891
			01	42	9,828	44	0	263	10,135	4,821	14,956
7440-41-7	**	Beryllium	98	19	799	26	0	57,818	58,643	20,404	79,047
			99	22	769	57	0	53,271	54,097	20,081	74,178
			00	23	360	309	0	84,484	85,153	2,916	88,069
			01	22	1,116	31	0	304,733	305,880	601	306,481
--	**	Beryllium compounds	98	61	21,382	1,865	0	733,229	756,476	98,087	854,563
			99	73	7,816	3,510	4,100	822,947	838,373	54,868	893,241
			00	60	10,809	8,512	0	798,268	817,589	45,683	863,272
			01	55	3,888	10,255	5,200	570,828	590,171	43,604	633,775
82657-04-3	*	Bifenthrin	98	6	760	5	0	0	765	19	784
			99	5	546	0	0	0	546	0	546
			00	6	1,012	0	0	0	1,012	0	1,012
			01	8	1,272	0	0	0	1,272	0	1,272
92-52-4	*	Biphenyl	98	136	537,237	4,106	29,574	1,224	572,141	49,935	622,076
			99	140	673,635	8,949	4,177	27	686,788	59,473	746,261
			00	134	584,321	5,830	1,100	183	591,434	36,383	627,817
			01	132	454,508	3,096	3,985	102	461,691	28,249	489,940

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)

No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

*** PBT chemical added to list for 2000 reporting year See Chapter 3 for more information.

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
Benzamide	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
*,** Benzene	98	37,791,735	1,231,107	17,231,356	9,446,599	52,623,884	4,114,327	8,861,645	131,300,653	86,711
	99	38,770,637	760,189	23,084,783	2,614,700	55,709,320	4,213,873	8,778,884	133,932,386	90,589
	00	22,176,732	1,595,369	43,150,982	2,599,886	69,600,386	2,269,988	7,705,586	149,098,929	40,711
	01	19,714,092	2,477,950	40,711,084	1,553,307	46,896,645	2,618,812	6,617,827	120,589,717	65,760
** Benzidine	98	0	0	0	0	101,123	58	34	101,215	0
	99	0	0	89,000	0	316,990	60	171	406,221	0
	00	0	0	0	0	291,547	781	17	292,345	0
	01	0	0	330	372	229,583	19	75	230,379	0
** Benzoic trichloride	98	0	0	0	20,000	175,768	34,870	2,669	233,307	0
	99	0	0	0	20,000	286,025	1,608	2,750	310,383	0
	00	0	0	0	0	231,409	1,214	2,128	234,751	0
	01	0	0	330	1,335	220,494	4,984	1,060	228,203	0
*** Benzo(g,h,i) perylene	98	NR	NR	NR	NR	NR	NR	NR	NR	NR
	99	NR	NR	NR	NR	NR	NR	NR	NR	NR
	00	79,332.32	12,435.97	1,835,315.93	5,659.33	282,304.34	2,661.73	165,206.35	2,382,915.98	639.52
	01	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
Benzoyl chloride	98	0	0	0	0	2,581,969	498,362	15,971	3,096,302	0
	99	0	0	0	0	2,874,379	336,441	12,839	3,223,659	0
	00	0	0	0	1,319	3,293,661	306,258	11,986	3,613,224	0
	01	0	0	250	7,971	2,173,475	203,893	9,712	2,395,301	0
* Benzoyl peroxide	98	10,364	0	0	1,191	98,989	49,139	8,972	168,655	0
	99	6,935	0	0	1,885	139,403	91,458	6,478	246,159	0
	00	9,153	0	0	290	82,082	78,180	21,261	190,966	0
	01	6,824	0	0	3,187	66,158	34,397	18,848	129,414	0
Benzyl chloride	98	4,800	0	17,000	420,878	734,857	76,610	31,426	1,285,571	0
	99	0	0	0	392,457	847,767	37,127	28,748	1,306,099	0
	00	208	0	0	520,751	752,711	5,731	22,193	1,301,594	18
	01	197	0	0	580,170	608,554	7,812	14,313	1,211,046	0
** Beryllium	98	160,399	84,146	0	0	10	8	63,356	307,919	0
	99	101,065	24,154	0	0	0	966	66,436	192,621	0
	00	622,263	66,837	0	0	9	1,319	89,904	780,332	40
	01	107,160	158,428	0	0	0	865	312,782	579,235	113
** Beryllium compounds	98	9,700	26,450	0	0	194	1,090	848,766	886,200	300
	99	9,700	38,384	0	0	0	1,349	906,201	955,634	0
	00	9,709	33,768	0	0	0	486	874,112	918,075	0
	01	11,657	29,220	0	0	0	85	642,450	683,412	2,043
* Bifenthrin	98	0	0	0	0	11,275	402	249	11,926	0
	99	0	0	0	0	1	2,069	71	2,141	0
	00	0	0	0	0	1	3,592	178	3,771	0
	01	4,400	0	0	0	11	1,141	255	5,807	0
* Biphenyl	98	306,564	288,334	1,079,699	144,786	774,971	765,225	627,268	3,986,847	3,938
	99	446,648	273,973	2,017,273	192,637	1,373,492	613,545	762,458	5,680,026	4,194
	00	230,846	727,786	1,864,140	126,895	4,079,546	599,713	644,984	8,273,910	4,543
	01	483,000	863,740	2,190,205	168,445	1,767,841	619,675	500,390	6,593,296	5,667

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports. No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

*** PBT chemical added to list for 2000 reporting year See Chapter 3 for more information.

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	On-site Releases: Surface Water Discharges Pounds	On-site Releases: Underground Injection Pounds	On-site Releases: Releases to Land Pounds	On-site Releases: Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
111-91-1		Bis (2-chloroethoxy) methane	98	2	1,434	0	930	1,024	3,388	0	3,388
			99	2	1,314	1	3,697	0	5,012	4	5,016
			00	3	1,335	0	9,302	0	10,637	455	11,092
			01	4	2,290	5	8,593	0	10,888	505	11,393
111-44-4	*	Bis(2-chloroethyl) ether	98	14	844	4	0	0	848	1	849
			99	15	364	24	0	0	388	313	701
			00	14	472	2	0	0	474	6,130	6,604
			01	14	576	15	0	0	591	521	1,112
542-88-1	**	Bis(chloromethyl) ether	98	2	0	0	0	0	0	0	0
			99	3	4	0	0	0	4	153	157
			00	2	0	5	0	0	5	0	5
			01	2	0	0	0	0	0	0	0
108-60-1		Bis(2-chloro-1-methylethyl) ether	98	2	3,360	46	0	2	3,408	0	3,408
			99	2	4,110	2	0	2	4,114	0	4,114
			00	4	2,922	2	0	4	2,928	0	2,928
			01	3	2,512	2	0	6	2,520	0	2,520
56-35-9	*	Bis(tributyltin) oxide	98	3	0	6	0	2	8	3,372	3,380
			99	5	10	6	0	1	17	3,923	3,940
			00	4	0	7	0	1	8	22,745	22,753
			01	3	0	6	0	1	7	3,476	3,483
10294-34-5		Boron trichloride	98	5	750	0	0	0	750	0	750
			99	8	350	0	0	0	350	0	350
			00	12	605	0	0	0	605	0	605
			01	11	626	0	0	0	626	0	626
7637-07-2		Boron trifluoride	98	22	37,802	5	0	0	37,807	0	37,807
			99	23	16,725	0	0	0	16,725	0	16,725
			00	26	11,595	0	0	0	11,595	250	11,845
			01	22	11,496	0	0	0	11,496	0	11,496
314-40-9	*	Bromacil	98	2	35	0	0	0	35	0	35
			99	2	10	0	0	0	10	0	10
			00	2	0	0	0	0	0	0	0
			01	2	0	0	0	0	0	0	0
53404-19-6	*	Bromacil, lithium salt	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
7726-95-6	*	Bromine	98	56	109,167	7,110	7	7,705	123,989	5	123,994
			99	50	247,423	15	0	7,705	255,143	37,868	293,011
			00	49	268,604	10	0	58,505	327,119	936	328,055
			01	47	322,726	765	0	10,260	333,751	152	333,903
35691-65-7	*	1-Bromo-1-(bromomethyl)-1,3-propane-dicarbonitrile	98	2	0	0	0	0	0	0	0
			99	4	0	0	0	0	0	0	0
			00	5	0	0	0	0	0	0	0
			01	5	0	0	0	0	0	0	0
353-59-3		Bromochloro-difluoromethane (Halon 1211)	98	4	3,673	0	0	0	3,673	0	3,673
			99	4	3,979	0	0	0	3,979	0	3,979
			00	6	2,737	0	0	0	2,737	0	2,737
			01	4	1,080	0	0	0	1,080	0	1,080

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

			Recycled		Energy Recovery		Treated				
	Chemical	Year	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
	Bis (2-chloroethoxy) methane	98	0	0	0	0	0	15	3,388	3,403	0
		99	0	0	0	0	28,000	0	5,011	33,011	0
		00	0	0	0	0	32,371	801	11,103	44,275	0
		01	0	0	330	22,074	42,698	488	11,409	76,999	0
*	Bis(2-chloroethyl) ether	98	0	159,909	426,404	9,541	550,609	349,619	853	1,496,935	0
		99	0	142,932	1,280,773	6,127	1,842,598	455,565	410	3,728,405	0
		00	0	0	927,539	5,321	1,628,247	625,940	483	3,187,530	0
		01	0	0	923,862	98,686	2,045,950	122,160	711	3,191,369	0
**	Bis(chloromethyl) ether	98	0	0	0	0	36,500	0	0	36,500	0
		99	0	0	0	0	145,933	0	157	146,090	0
		00	0	0	0	0	104,878	0	3	104,881	0
		01	0	0	0	0	79,474	0	0	79,474	0
	Bis(2-chloro-1-methylethyl) ether	98	8,900,000	0	6,000,000	0	1,410,000	0	3,500	16,313,500	0
		99	2,800,000	0	7,210,000	0	5,149,000	0	4,100	15,163,100	0
		00	0	0	5,433,123	0	202,102,743	771	2,930	207,539,567	0
		01	1,451,713	0	9,925,905	2,489,000	11,815,309	0	2,520	25,684,447	0
*	Bis(tributyltin) oxide	98	0	58,478	0	0	336	0	3,380	62,194	0
		99	0	35,864	0	0	346	530	4,367	41,107	0
		00	0	49,641	0	0	257	0	22,752	72,650	7,834
		01	0	43,200	0	0	457	0	5,119	48,776	1,636
	Boron trichloride	98	6,700	0	0	0	53,000	0	335	60,035	2
		99	9,100	0	0	0	16,000	10,000	145	35,245	0
		00	85,596	0	0	0	16,761	0	347	102,704	2
		01	50,626	0	0	0	28,034	0	348	79,008	1
	Boron trifluoride	98	0	0	0	35	462,635	15,255	35,056	512,981	449
		99	0	0	0	0	509,864	1,130	16,455	527,449	181
		00	0	0	0	31	748,803	1,148	11,232	761,214	25
		01	0	0	0	0	703,647	2,307	11,229	717,183	111
*	Bromacil	98	0	0	0	0	32,434	0	1,217	33,651	0
		99	0	0	0	0	17,343	0	850	18,193	0
		00	0	0	0	0	20,647	0	0	20,647	0
		01	0	0	0	0	27,555	1	0	27,556	0
*	Bromacil, lithium salt	98	No reports								
		99	No reports								
		00	No reports								
		01	No reports								
*	Bromine	98	5,670,000	230	0	162,356	18,624,717	20,781	127,419	24,605,503	194
		99	130,800	3,421	0	0	918,137	483,028	261,790	1,797,176	798
		00	319,700	1,697,423	0	0	578,967	347,171	327,149	3,270,410	94
		01	908,800	426	0	0	489,191	169,403	320,022	1,887,842	22,425
*	1-Bromo-1-(bromomethyl)-1,3-propane-dicarbonitrile	98	0	0	0	0	11,000	9,824	0	20,824	0
		99	0	0	0	0	0	9,595	0	9,595	0
		00	0	0	0	0	0	9,570	0	9,570	0
		01	0	0	0	0	0	9,413	0	9,413	0
	Bromochloro-difluoromethane (Halon 1211)	98	501,947	0	0	0	0	0	3,673	505,620	174
		99	485,900	0	0	0	0	0	3,827	489,727	152
		00	241,000	0	0	0	0	2,389	2,737	246,126	847
		01	45,000	0	0	0	0	0	914	45,914	166

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
75-25-2		Bromoform	98	3	3	0	0	0	3	0	3
			99	2	7	1	0	0	8	4	12
			00	4	12	0	0	0	12	5	17
			01	1	7	0	0	0	7	0	7
74-83-9	*	Bromomethane	98	47	1,556,612	30	230	11	1,556,883	0	1,556,883
			99	47	1,431,753	29	0	4	1,431,786	1,603	1,433,389
			00	50	954,871	37	5	9	954,922	5	954,927
			01	42	723,519	139	29,653	6,048	759,359	3,441	762,800
75-63-8		Bromotrifluoro-methane (Halon 1301)	98	6	26,842	0	0	0	26,842	0	26,842
			99	6	30,825	0	0	0	30,825	0	30,825
			00	7	27,899	0	0	0	27,899	0	27,899
			01	6	13,451	0	0	0	13,451	0	13,451
1689-84-5	*	Bromoxynil	98	2	506	0	0	0	506	1,483	1,989
			99	3	3	0	0	0	3	790	793
			00	2	0	0	0	0	0	0	0
			01	2	0	0	0	0	0	0	0
1689-99-2	*	Bromoxynil octanoate	98	5	1,566	0	0	0	1,566	14,420	15,986
			99	6	519	0	0	0	519	8,926	9,445
			00	6	37	0	15,462	0	15,499	0	15,499
			01	4	0	0	0	0	0	0	0
357-57-3		Brucine	98	1	0	0	0	0	0	0	0
			99	2	4	0	0	0	4	153	157
			00	1	0	0	0	0	0	0	0
			01	1	0	0	0	0	0	0	0
106-99-0	**	1,3-Butadiene	98	200	2,771,886	8,834	732	7,998	2,789,450	2,567	2,792,017
			99	202	2,062,683	1,931	720	127	2,065,461	2,571	2,068,032
			00	201	2,117,926	1,163	850	60,140	2,180,079	185,861	2,365,940
			01	200	2,145,152	1,507	49,062	57,491	2,253,212	62,670	2,315,882
141-32-2		Butyl acrylate	98	170	212,785	7,790	0	546	221,121	48,054	269,175
			99	169	245,013	8,747	156	546	254,462	32,208	286,670
			00	167	233,013	14,566	271	245	248,095	22,782	270,877
			01	163	151,953	152	0	27	152,132	17,293	169,425
71-36-3		n-Butyl alcohol	98	1,207	21,707,849	94,523	3,230,606	5,579	25,038,557	398,919	25,437,476
			99	1,151	20,701,979	56,287	3,189,043	4,626	23,951,935	730,471	24,682,406
			00	1,128	19,347,222	35,909	3,839,648	63,477	23,286,256	370,900	23,657,156
			01	1,012	16,851,702	40,175	834,584	2,128	17,728,589	1,262,133	18,990,722
78-92-2	*	sec-Butyl alcohol	98	154	1,010,436	3,950	169,243	13,007	1,196,636	16,585	1,213,221
			99	148	905,211	11,020	145,995	13,708	1,075,934	17,436	1,093,370
			00	144	774,879	11,924	119,420	12,474	918,697	17,424	936,121
			01	130	787,478	7,025	725,164	11	1,519,678	10,040	1,529,718
75-65-0	*	tert-Butyl alcohol	98	110	444,928	30,351	861,956	8,444	1,345,679	182,246	1,527,925
			99	118	400,931	17,334	770,634	756	1,189,655	78,307	1,267,962
			00	113	775,480	9,459	766,198	502	1,551,639	115,374	1,667,013
			01	121	512,122	19,778	614,070	53	1,146,023	51,146	1,197,169
106-88-7	**	1,2-Butylene oxide	98	14	10,582	8,401	0	0	18,983	0	18,983
			99	14	11,629	2,402	0	0	14,031	0	14,031
			00	15	7,817	5,700	0	40	13,557	0	13,557
			01	17	6,139	934	0	0	7,073	0	7,073

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR: not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

	Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
	Bromoform	98	0	0	0	0	10,594	2	3	10,599	0
		99	0	0	0	0	18,216	2	2	18,220	0
		00	0	0	0	0	37,797	775	15	38,587	0
		01	0	0	0	0	25,984	1,611	7	27,602	0
*	Bromomethane	98	12,780	0	222,300	280	491,592	30	1,553,095	2,280,077	14,067
		99	295,500	0	273,800	160	1,125,601	2,455	1,346,274	3,043,790	15,326
		00	85,403	0	267,700	2,800	1,078,592	807	953,986	2,389,288	15
		01	21,710	0	255,702	0	2,302,388	621	760,936	3,341,357	210
	Bromotrifluoro-methane (Halon 1301)	98	583,803	0	0	0	0	0	26,592	610,395	6,468
		99	647,796	0	0	0	0	0	29,446	677,242	1,629
		00	210,854	0	0	0	0	0	26,231	237,085	1,873
		01	162,068	6,749	0	0	0	0	10,797	179,614	2,534
*	Bromoxynil	98	0	0	0	0	0	0	1,244	1,244	0
		99	0	0	0	0	0	0	790	790	0
		00	0	0	0	0	0	0	0	0	0
		01	0	0	0	0	0	0	0	0	0
*	Bromoxynil octanoate	98	0	0	0	0	0	40	21,215	21,255	0
		99	0	0	0	0	0	397	13,525	13,922	0
		00	0	0	0	0	0	171	18,689	18,860	0
		01	0	0	0	0	0	722	0	722	0
	Brucine	98	0	0	0	0	0	0	0	0	0
		99	0	0	0	0	94,553	0	157	94,710	0
		00	0	0	0	0	67,901	0	0	67,901	0
		01	0	0	0	0	41,188	0	0	41,188	0
**	1,3-Butadiene	98	5,428,139	15,575,833	15,244,040	479,609	53,603,455	3,927,742	2,754,997	97,013,815	776,815
		99	5,488,890	11,539,996	38,304,604	460,901	54,190,421	309,263	2,093,924	112,387,999	59,750
		00	5,231,395	10,902,156	23,915,854	826,580	423,309,451	410,780	2,154,235	466,750,451	59,799
		01	4,456,061	10,851,688	15,604,022	572,433	67,559,004	901,275	2,197,823	102,142,306	12,089
	Butyl acrylate	98	270,060	950	3,912,299	1,023,562	11,904,948	87,942	232,863	17,432,624	6,129
		99	330,066	1,466	3,058,697	661,536	2,929,487	181,935	268,977	7,432,164	1,422
		00	334,515	197	1,461,786	659,125	1,635,982	191,595	257,364	4,540,564	215
		01	36,195	4	1,901,135	201,352	1,206,628	473,280	167,956	3,986,550	1,038
	n-Butyl alcohol	98	9,987,297	2,589,149	29,259,817	18,138,506	44,571,246	6,242,842	25,701,730	136,490,587	58,866
		99	11,752,536	2,288,294	33,343,813	13,359,119	35,199,526	5,958,606	24,822,533	126,724,427	21,589
		00	11,575,871	2,116,734	25,227,636	12,558,115	34,772,758	5,178,159	24,133,065	115,562,338	8,316
		01	8,927,925	1,935,281	25,681,561	12,447,831	34,996,925	4,873,723	20,642,906	109,506,152	58,479
*	sec-Butyl alcohol	98	172,123	9,319	10,701,253	1,258,820	1,532,725	489,996	1,223,276	15,387,512	0
		99	380,581	76,228	12,708,755	1,409,442	1,446,464	175,759	1,100,391	17,297,620	0
		00	414,303	17,826	11,128,795	991,871	1,961,488	325,349	946,413	15,786,045	1,105
		01	361,442	69,337	17,804,921	1,067,576	1,627,836	444,138	1,599,508	22,974,758	135
*	tert-Butyl alcohol	98	693,964	231,409	37,637,302	11,348,179	2,461,322	1,852,842	1,515,800	55,740,818	73
		99	747,403	20,193	38,801,186	9,006,874	1,935,642	1,789,688	1,601,437	53,902,423	21,125
		00	1,255,200	13,016	18,304,607	8,560,177	3,476,523	2,219,446	1,647,961	35,476,930	2,828
		01	618,442	224,709	28,981,995	8,812,257	4,722,734	1,830,258	1,140,456	46,330,851	1,262
**	1,2-Butylene oxide	98	1	0	0	275,493	498,660	342	18,816	793,312	0
		99	2	0	0	282,209	382,501	620	14,295	679,627	0
		00	0	0	0	316,641	154,942	730	13,631	485,944	0
		01	5	0	261,895	348,640	52,105	593	20,201	683,439	0

Note: Data from Section 8 (Current Year) of Form R

NR. not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
123-72-8	*	Butyraldehyde	98	33	289,956	618	29,000	1,478	321,052	1,666	322,718
			99	34	295,543	466	29,003	149,000	474,012	6,827	480,839
			00	31	403,531	3,670	29,003	0	436,204	12,204	448,408
			01	31	439,797	942	29,003	0	469,742	7,595	477,337
7440-43-9	**	Cadmium	98	70	3,427	402	166,607	2,441,086	2,611,522	159,392	2,770,914
			99	65	4,297	291	61,000	1,660,677	1,726,265	301,634	2,027,899
			00	65	2,271	532	69,000	661,690	733,493	7,746	741,239
			01	61	1,672	279	72,000	652,422	726,373	117,964	844,337
--	**	Cadmium compounds	98	135	85,302	2,281	226,908	8,691,212	9,005,703	1,601,415	10,607,118
			99	132	33,861	2,666	100,023	10,491,679	10,628,229	870,258	11,498,487
			00	133	30,067	9,015	110,284	6,149,907	6,299,273	2,582,310	8,881,583
			01	124	20,746	2,507	90,292	12,492,456	12,606,001	2,561,930	15,167,931
156-62-7	*	Calcium cyanamide	98	4	134	0	0	0	134	0	134
			99	4	250	0	0	0	250	0	250
			00	3	250	0	0	0	250	0	250
			01	2	86	0	0	0	86	0	86
133-06-2	*	Captan	98	14	9,213	5	0	0	9,218	1,899	11,117
			99	14	5,111	5	0	0	5,116	1,097	6,213
			00	14	4,120	5	0	0	4,125	1,985	6,110
			01	15	2,668	10	0	0	2,678	2,328	5,006
63-25-2	*	Carbaryl	98	25	7,831	10	0	100	7,941	9,288	17,229
			99	18	5,280	5	0	20,148	25,433	41,403	66,836
			00	17	4,590	5	0	0	4,595	4,085	8,680
			01	21	6,944	5	0	0	6,949	5,747	12,696
1563-66-2	*	Carbofuran	98	7	2,937	1	0	0	2,938	2	2,940
			99	6	834	112	0	0	946	23	969
			00	6	1,628	5	0	0	1,633	0	1,633
			01	7	1,435	5	0	0	1,440	0	1,440
75-15-0	*	Carbon disulfide	98	113	43,448,281	4,691	16,599	1,651	43,471,222	5,825	43,477,047
			99	119	35,919,874	6,552	16,110	256	35,942,792	2,763	35,945,555
			00	118	40,574,701	3,706	17,456	2,874	40,598,737	3,220	40,601,957
			01	121	18,157,289	30,619	16,745	3,623	18,208,276	3,355	18,211,631
56-23-5	*,**	Carbon tetrachloride	98	71	275,342	2,836	23,168	1,679	303,025	20,251	323,276
			99	70	232,988	85	27,548	938	261,559	16,566	278,125
			00	62	284,301	184	62,203	837	347,525	2,548	350,073
			01	58	290,082	85	113,881	5,929	409,977	3,543	413,520
463-58-1		Carbonyl sulfide	98	93	19,869,719	0	0	0	19,869,719	0	19,869,719
			99	107	21,351,947	0	0	0	21,351,947	0	21,351,947
			00	109	21,907,039	0	0	0	21,907,039	0	21,907,039
			01	106	18,165,335	0	0	0	18,165,335	0	18,165,335
5234-68-4	*	Carboxin	98	3	5	0	0	0	5	17	22
			99	4	5	0	0	0	5	154	159
			00	4	4	0	0	0	4	118	122
			01	4	2	0	0	0	2	68	70
120-80-9	**	Catechol	98	144	5,349	24,422	0	1,032	30,803	938	31,741
			99	140	7,037	29,119	0	968	37,124	3,042	40,166
			00	141	7,870	18,165	0	605	26,640	2,624	29,264
			01	132	7,656	17,190	0	2,348	27,194	919	28,113

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufac ured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

		Recycled		Energy Recovery		Treated				
Chemical	Year	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
* Butyraldehyde	98	1,500	31,000	2,136,982	40,710	1,928,784	651,535	317,838	5,108,349	5,207
	99	1,500	1,200	4,909,209	40,812	7,983,588	176,272	409,140	13,521,721	81,117
	00	0	1,200	3,177,064	544,327	2,198,817	503,656	477,280	6,902,344	831
	01	0	1,900	2,471,672	11,415	2,600,986	528,138	475,568	6,089,679	164
** Cadmium	98	1,101,823	321,749	0	0	27,779	63,036	2,688,393	4,202,780	9,410
	99	231,447	326,999	0	0	29,363	11,573	1,758,914	2,358,296	10
	00	17,347	147,964	0	0	28,617	15,460	803,306	1,012,694	0
	01	7,710	51,053	0	0	3,118	5,886	877,953	945,720	915
** Cadmium compounds	98	2,566,537	722,234	0	5,236	6,225	52,112	11,587,132	14,939,476	59,703
	99	3,081,739	670,466	0	212	4,654	21,021	8,529,626	12,307,718	160,626
	00	3,342,325	812,756	0	0	75,121	109,942	8,840,137	13,180,281	79,937
	01	1,987,292	537,375	0	0	2,459	1,036	14,160,676	16,688,838	220,697
* Calcium cyanamide	98	0	0	0	0	0	0	130	130	0
	99	0	0	0	0	0	0	26	26	0
	00	0	0	0	0	0	0	43	43	0
	01	0	0	0	0	0	0	90	90	0
* Captan	98	2,697	0	0	0	77,416	3,944	11,437	95,494	0
	99	2,314	0	0	0	75,081	17,910	9,949	105,254	0
	00	1,947	0	0	0	87,768	6,529	8,240	104,484	0
	01	1,836	0	0	0	102,257	3,691	5,644	113,428	0
* Carbaryl	98	80,456	0	79,931	0	443,809	24,121	14,617	642,934	100
	99	71,825	97	64	0	506,541	11,446	19,681	609,654	0
	00	96,000	0	5	0	514,273	18,519	14,839	643,636	0
	01	112,001	0	151,892	0	469,232	10,951	13,059	757,135	0
* Carbofuran	98	0	0	0	0	243,293	35,601	2,937	281,831	275
	99	0	0	0	0	162,525	19,615	14,136	196,276	0
	00	38,200	0	0	0	106,969	34,542	1,074	180,785	0
	01	0	0	0	0	106,951	39,332	886	147,169	0
* Carbon disulfide	98	30,024,800	1,985	10,895,966	242,037	34,314,909	251,698	43,261,258	118,992,653	24,332
	99	25,913,004	1,067	11,332,692	99,958	41,970,122	454,153	35,869,549	115,640,545	22,514
	00	32,143,299	494	11,070,081	115,546	47,936,880	147,625	40,603,238	132,017,163	22,401
	01	18,568,342	109	12,720,194	64,281	41,307,860	145,647	31,775,361	104,581,794	23,582
*,** Carbon tetrachloride	98	2,223,265	2,075,495	1,277,378	320,867	16,050,925	3,042,723	303,924	25,294,577	4,827
	99	7,066,850	3,197,695	869,742	91,975	18,126,761	725,638	230,752	30,309,413	28,179
	00	2,131,751	2,695,645	2,658,397	22,462	351,830,194	588,903	338,405	360,265,757	30,690
	01	2,577,719	328,474	2,796,974	38,159	15,078,872	757,447	468,608	22,046,253	25,013
Carbonyl sulfide	98	0	0	2,759,669	0	20,273,532	0	20,021,053	43,054,254	2
	99	0	0	4,189,794	0	79,163,220	0	21,530,378	104,883,392	5,711
	00	0	0	3,909,451	0	81,788,605	0	22,063,175	107,761,231	6,001
	01	120,000	0	5,471,567	0	36,226,510	0	18,190,898	60,008,975	27,350
* Carboxin	98	1,110	0	0	0	0	218	22	1,350	0
	99	1,538	0	0	0	0	60	159	1,757	0
	00	1,162	0	0	0	0	596	120	1,878	0
	01	688	0	0	0	0	30	70	788	0
** Catechol	98	0	0	9,720,992	117,794	4,447,791	50,640	35,139	14,372,356	0
	99	0	4,594	10,920,586	140,011	3,850,404	100,528	82,919	15,099,042	1
	00	0	35,136	6,293,994	72,241	2,294,441	174,898	28,706	8,899,416	54
	01	0	28,586	4,962,351	57,100	2,078,468	61,673	27,811	7,215,989	9

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
2439-01-2	*	Chinomethionat	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
133-90-4	*	Chloramben	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
57-74-9	*,**	Chlordane	98	7	45	0	20,106	25,548	45,699	22	45,721
			99	4	8	1	0	0	9	40	49
		Not comparable	00	20	13.70	0.00	0.00	8,947.74	8,961.44	46.59	9,008.03
		to prior years***	01	20	15.49	80.00	0.00	3,630.30	3,725.79	331.61	4,057.40
115-28-6	**	Chlorendic acid	98	2	30	0	0	0	30	0	30
			99	2	32	0	0	0	32	0	32
			00	2	34	0	0	0	34	0	34
			01	3	53	0	0	0	53	5	58
90982-32-4	*	Chlorimuron ethyl	98	2	3	0	0	0	3	0	3
			99	2	27	0	0	0	27	0	27
			00	2	12	0	0	0	12	0	12
			01	2	12	0	0	0	12	0	12
7782-50-5	*	Chlorine	98	1,352	59,689,567	432,868	114,341	210,602	60,447,378	30,260	60,477,638
			99	1,258	49,220,391	408,373	75,710	110,679	49,815,153	67,112	49,882,265
			00	1,207	45,589,230	285,008	167,321	252,220	46,293,779	52,868	46,346,647
			01	1,125	16,001,912	221,803	169,803	49,524	16,443,042	45,275	16,488,317
10049-04-4	*	Chlorine dioxide	98	122	1,018,717	581	0	0	1,019,298	0	1,019,298
			99	118	974,051	873	0	5	974,929	0	974,929
			00	118	742,791	584	0	0	743,375	0	743,375
			01	116	582,005	310	0	0	582,315	0	582,315
79-11-8	*	Chloroacetic acid	98	26	3,585	16	0	0	3,601	500	4,101
			99	21	4,565	17	0	0	4,582	328	4,910
			00	23	3,183	17	0	300	3,500	250	3,750
			01	25	3,699	753	0	0	4,452	260	4,712
532-27-4	*	2-Chloroaceto-	98	No reports							
		phenone	99	No reports							
			00	No reports							
			01	No reports							
4080-31-3	*	1-(3-Chloroallyl)-	98	16	437	11	0	653	1,101	5,138	6,239
		3,5,7-triaza-1-	99	12	217	10	0	509	736	5,769	6,505
		azoniaadaman-	00	13	107	10	0	349	466	14,240	14,706
		tane chloride	01	13	13	10	0	0	23	4,382	4,405
106-47-8	*,**	p-Chloroaniline	98	5	6,201	12	0	0	6,213	0	6,213
			99	5	132	337	0	0	469	0	469
			00	7	446	60	0	0	506	5	511
			01	7	551	45	0	17,425	18,021	8,513	26,534
108-90-7	*	Chlorobenzene	98	93	775,232	912	184,356	16	960,516	21,633	982,149
			99	93	694,145	1,684	175,544	214	871,587	31,670	903,257
			00	90	698,411	474	217,867	1,206	917,958	17,593	935,551
			01	85	691,985	685	106,453	23	799,146	5,390	804,536

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)

No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

*** Data for PBT Chemicals, due to threshold change for 2000 reporting year, are not comparable to prior year reporting See Chapter 3 for more information

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
* Chinomethionat	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
* Chloramben	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
*,** Chlordane	98	0	0	0	25,778	187,264	35	45,721	258,798	0
	99	0	0	0	0	470,719	114	46	470,879	0
Not comparable	00	0.00	0.00	230.00	0.00	812,322.92	4,904.05	9,007.26	826,464.23	0.00
to prior years***	01	0.00	0.00	244.00	0.00	463,839.30	457.00	4,024.29	468,564.59	0.00
** Chlorendic acid	98	0	0	0	0	0	567	30	597	0
	99	0	0	0	0	0	157	32	189	0
	00	0	0	0	0	0	691	34	725	0
	01	0	0	0	2	27,044	3,702	46	30,794	0
* Chlorimuron ethyl	98	0	0	0	0	0	33,861	3	33,864	0
	99	0	0	0	0	0	11,885	27	11,912	0
	00	2,612	0	0	0	0	5,388	12	8,012	0
	01	2,612	0	0	0	0	4,452	12	7,076	0
* Chlorine	98	72,240,957	88,349	0	50,291	254,282,903	969,312	60,462,093	388,093,905	9,841
	99	71,647,869	83,825	2	60,545	215,968,859	818,038	49,793,886	338,373,024	20,568
	00	191,692,658	20,685	14,176,058	3,984	747,938,290	779,057	46,228,895	1,000,839,627	4,704
	01	155,857,244	14,303	14,646,699	50,600	364,287,065	535,275	16,700,285	552,091,471	126,642
* Chlorine dioxide	98	2,725,788	0	0	0	48,701,526	6,000	1,063,516	52,496,830	860
	99	722,759	0	0	0	48,746,241	0	998,505	50,467,505	260
	00	700,467	0	0	0	22,907,298	0	760,349	24,368,114	2,589
	01	761,426	0	0	0	42,669,420	0	581,774	44,012,620	174
* Chloroacetic acid	98	85,721	0	0	0	1,219,307	568	3,250	1,308,846	0
	99	83,319	0	0	0	867,368	1,419	4,768	956,874	0
	00	46,315	0	63,818	0	1,137,587	1,933	3,182	1,252,835	0
	01	39,220	0	0	0	1,095,415	1,775	3,941	1,140,351	0
* 2-Chloroaceto-	98	No reports								
phenone	99	No reports								
	00	No reports								
	01	No reports								
* 1-(3-Chloroallyl)-	98	78,111	0	0	0	2,310	12,150	6,753	99,324	0
3,5,7-triaza-1-	99	31,211	0	0	0	1,834	331,049	6,541	370,635	0
azoniaadaman-	00	26,419	0	0	0	1,414	28,161	16,153	72,147	0
tane chloride	01	25,644	0	0	0	857	28,459	4,638	59,598	0
*,** p-Chloroaniline	98	0	0	46,000	520	25,861	6,424	16,117	94,922	0
	99	0	0	570,000	1,372	19,048	7,396	472	598,288	0
	00	0	0	74,005	55,813	19,920	10,947	503	161,188	0
	01	0	0	253,860	2,429	15,169	7,352	26,297	305,107	0
* Chlorobenzene	98	1,367,757	976,071	5,511,387	3,557,689	12,153,264	4,805,423	985,846	29,357,437	831
	99	4,838,112	6,186,066	4,363,580	1,850,965	8,869,212	1,680,763	864,813	28,653,511	16,466
	00	2,518,468	974,100	4,699,260	2,122,490	12,004,015	1,307,064	930,387	24,555,784	191
	01	2,332,100	875,243	3,692,734	1,586,940	9,074,613	1,501,846	802,518	19,865,994	257

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

*** Data for PBT Chemicals, due to threshold change for 2000 reporting year, are not comparable to prior year reporting See Chapter 3 for more information

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	On-site Releases: Surface Water Discharges Pounds	On-site Releases: Underground Injection Pounds	On-site Releases: Releases to Land Pounds	On-site Releases: Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
510-15-6	*	Chlorobenzilate	98	1	0	0	0	0	0	0	0
			99	1	2	1	0	0	3	10	13
			00	2	0	0	0	0	0	10	10
			01	2	0	0	0	0	0	260	260
75-68-3		1-Chloro-1,1-di-fluoroethane (HCFC-142b)	98	31	5,529,855	40	0	0	5,529,895	5,593	5,535,488
			99	35	5,644,160	44	0	0	5,644,204	5,108	5,649,312
			00	30	5,654,567	34	0	0	5,654,601	4,693	5,659,294
			01	31	5,510,995	15	0	0	5,511,010	9,732	5,520,742
75-45-6	*	Chlorodifluoro-methane (HCFC-22)	98	251	9,201,751	3,652	0	1	9,205,404	50,648	9,256,052
			99	265	8,622,691	3,652	0	1	8,626,344	67,799	8,694,143
			00	264	8,671,088	2,891	0	1	8,673,980	57,036	8,731,016
			01	253	8,722,907	2,891	0	36,000	8,761,798	50,777	8,812,576
75-00-3		Chloroethane	98	61	2,199,019	1,024	67	50	2,200,160	3,903	2,204,063
			99	56	2,134,114	261	130	0	2,134,505	2,309	2,136,814
			00	60	2,067,847	693	110	0	2,068,650	34,649	2,103,299
			01	57	1,301,471	1,033	0	5	1,302,509	50,548	1,353,057
67-66-3	*,**	Chloroform	98	161	6,291,839	127,319	44,107	12,349	6,475,614	46,078	6,521,692
			99	155	5,265,650	86,239	123,696	11,776	5,487,361	91,880	5,579,241
			00	132	3,444,413	56,341	226,742	13,779	3,741,275	11,270	3,752,545
			01	104	1,427,683	18,995	146,747	8,713	1,602,138	25,686	1,627,824
74-87-3	*	Chloromethane	98	112	2,654,828	1,747	294,101	62	2,950,738	959	2,951,697
			99	110	2,778,378	2,159	158,680	8,281	2,947,498	6,650	2,954,148
			00	109	1,910,918	1,182	164,495	1,232	2,077,827	9,613	2,087,440
			01	96	1,738,062	1,004	169,412	12,259	1,920,737	6,778	1,927,515
107-30-2	**	Chloromethyl methyl ether	98	3	1,000	0	0	0	1,000	0	1,000
			99	5	1,370	1	0	0	1,371	169	1,540
			00	4	1,600	0	0	0	1,600	10	1,610
			01	4	1,841	0	0	0	1,841	260	2,101
563-47-3	**	3-Chloro-2-methyl-1-propene	98	3	7,353	0	0	0	7,353	0	7,353
			99	4	8,716	0	0	0	8,716	0	8,716
			00	3	8,540	0	0	0	8,540	0	8,540
			01	3	7,917	0	0	0	7,917	0	7,917
--	**	Chlorophenols	98	12	4,885	81	73,548	0	78,514	12,188	90,702
			99	12	3,525	120	59,159	2	62,806	3,624	66,430
			00	8	606	100	31,593	1	32,300	1,816	34,116
			01	11	832	28	40,903	6,365	48,128	4,625	52,753
104-12-1		p-Chlorophenyl isocyanate	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
76-06-2	*	Chloropicrin	98	17	7,564	0	0	0	7,564	270	7,834
			99	16	6,651	0	0	0	6,651	1	6,652
			00	14	7,650	0	0	0	7,650	0	7,650
			01	11	7,480	0	0	0	7,480	0	7,480
126-99-8	**	Chloroprene	98	15	978,218	0	100,000	0	1,078,218	1	1,078,219
			99	11	907,146	0	29,000	0	936,146	0	936,146
			00	14	974,421	0	47,000	0	1,021,421	0	1,021,421
			01	17	852,009	0	62,000	67,000	981,009	0	981,009

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
* Chlorobenzilate	98	0	0	0	0	0	0	0	0	0
	99	0	0	0	0	41,000	0	9	41,009	0
	00	0	0	0	0	53,702	874	8	54,584	0
	01	0	0	330	268	87,104	113	69	87,884	0
1-Chloro-1,1-di-	98	67	0	0	5,400	671,283	165,589	5,538,107	6,380,446	102
fluoroethane	99	12,089,067	0	0	142,321	1,128,410	190,798	5,577,181	19,127,777	12
(HCFC-142b)	00	48,356,067	0	0	101,208	1,289,639	142,684	5,671,815	55,561,413	3,815
	01	48,356,082	0	0	27,768	1,412,130	148,939	5,483,368	55,428,287	35
* Chlorodifluoro-	98	698,765	168,042	0	237	505,214	291,198	9,350,346	11,013,802	127,066
methane	99	867,735	506,388	0	2,422	359,463	204,516	8,716,127	10,656,651	28,168
(HCFC-22)	00	1,159,592	523,180	0	1,884	549,878	743,079	8,747,437	11,725,050	102,948
	01	1,134,519	517,831	2	40	457,236	304,036	8,696,613	11,110,277	186,166
Chloroethane	98	5,135,802	170,083	13,263,574	17,934	35,547,916	337,226	2,206,782	56,679,317	134
	99	535,427	429,824	22,516,043	119,801	28,690,272	504,451	2,135,609	54,931,427	1,400
	00	485,765	260,018	37,990,489	238,935	22,965,104	475,183	2,072,145	64,487,639	543
	01	691,700	2,238	35,104,901	64,005	12,826,001	545,601	1,305,302	50,539,748	3,946
*,** Chloroform	98	6,785,284	1,887,187	5,135,376	461,943	22,151,133	4,128,642	6,488,716	47,038,281	21,625
	99	9,158,233	2,771,608	1,624,788	557,712	27,717,442	2,212,418	5,466,705	49,508,906	51,663
	00	8,175,408	2,033,975	3,803,728	294,764	132,136,466	2,006,659	3,680,517	152,131,516	32,396
	01	7,834,746	696,259	3,636,710	298,893	18,332,567	2,332,433	1,635,589	34,767,197	41,432
* Chloromethane	98	3,447,064	23,740	4,261,426	17,950	8,711,360	2,289,660	2,936,003	21,687,203	12,001
	99	3,323,864	1	5,274,618	2,063	14,091,248	234,595	2,951,070	25,877,459	36,410
	00	2,500,325	0	5,631,302	69,978	118,480,361	120,870	2,067,939	128,870,775	8,398
	01	3,999,667	0	4,113,646	42,634	8,319,643	223,806	1,923,489	18,622,885	5,558
** Chloromethyl	98	0	0	0	0	280	0	1,000	1,280	0
methyl ether	99	0	0	0	0	164,969	0	1,535	166,504	0
	00	0	0	0	0	133,017	791	1,465	135,273	0
	01	0	0	330	372	467,477	16	1,734	469,929	0
** 3-Chloro-2-	98	0	0	0	0	637,973	344	7,353	645,670	0
methyl-	99	0	0	0	0	550,770	16,664	8,525	575,959	0
1-propene	00	0	0	0	0	538,391	7,504	8,329	554,224	0
	01	0	0	0	0	1,304,638	15,111	7,917	1,327,666	0
** Chlorophenols	98	2,737,000	0	1,009	62,967	578,888	17,452	89,720	3,487,036	725
	99	2,148,700	0	2,837	78,708	1,929,421	3,710	65,357	4,228,733	1,070
	00	1,838,000	0	2,456	2,991	367,336	3,534	32,958	2,247,275	858
	01	3,780,252	0	2,178	2,217	502,715	3,327	55,203	4,345,892	341
p-Chlorophenyl	98	No reports								
isocyanate	99	No reports								
	00	No reports								
	01	No reports								
* Chloropicrin	98	2,250	1,064	0	0	1,110	483	7,548	12,455	0
	99	2,206	914	0	0	4,233	412	6,651	14,416	10
	00	2,112	0	0	905	4,620	942	7,650	16,229	0
	01	8,034	0	0	0	1,225	6,814	7,614	23,687	56
** Chloroprene	98	0	306,514	2,150,000	79,591	8,962,700	209,357	1,077,993	12,786,155	10
	99	0	584,238	1,945,200	798	8,773,757	115,522	935,904	12,355,419	0
	00	7,264	642,816	1,959,118	29,272	5,818,742	59,694	1,021,419	9,538,325	0
	01	140,000	202,653	1,108,175	0	4,122,930	29,503	980,801	6,584,062	1

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number	Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	On-site Releases: Surface Water Discharges Pounds	On-site Releases: Underground Injection Pounds	On-site Releases: Releases to Land Pounds	On-site Releases: Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
542-76-7	3-Chloropropionitrile	98	No reports							
		99	2	4	0	0	0	4	153	157
		00	1	0	0	0	0	0	0	0
		01	1	0	0	0	0	0	0	0
63938-10-3	Chlorotetrafluoroethane	98	1	0	0	0	0	0	0	0
		99	2	129,800	0	0	0	129,800	0	129,800
		00	1	40,043	0	0	0	40,043	0	40,043
		01	1	0	0	0	0	0	0	0
354-25-6	1-Chloro-1,1,2,2-tetrafluoroethane (HCFC-124a)	98	3	23,336	0	0	0	23,336	0	23,336
		99	3	59,525	0	0	0	59,525	0	59,525
		00	4	48,929	0	0	0	48,929	0	48,929
		01	6	47,509	0	0	0	47,509	0	47,509
2837-89-0	2-Chloro-1,1,1,2-tetrafluoroethane (HCFC-124)	98	24	751,326	5	0	0	751,331	0	751,331
		99	23	604,372	5	0	0	604,377	0	604,377
		00	23	580,413	5	0	0	580,418	0	580,418
		01	21	677,469	5	0	0	677,474	0	677,474
1897-45-6 *,**	Chlorothalonil	98	26	9,236	35	5	32,000	41,276	301,806	343,082
		99	20	5,106	7	0	0	5,113	280,116	285,229
		00	21	4,882	44	0	0	4,926	201,402	206,328
		01	19	7,225	179	0	0	7,404	290,303	297,707
95-69-2 **	p-Chloro-o-toluidine	98	No reports							
		99	No reports							
		00	No reports							
		01	No reports							
75-88-7	2-Chloro-1,1,1-trifluoroethane (HCFC-133a)	98	4	162,775	52	0	0	162,827	0	162,827
		99	3	23,950	30	0	0	23,980	0	23,980
		00	3	77,750	0	0	0	77,750	0	77,750
		01	6	52,837	34	0	0	52,871	500	53,371
75-72-9	Chlorotrifluoromethane (CFC-13)	98	1	14,700	5	0	0	14,705	0	14,705
		99	2	10,790	5	0	0	10,795	0	10,795
		00	3	17,101	5	0	0	17,106	0	17,106
		01	5	54,074	5	0	0	54,079	0	54,079
460-35-5	3-Chloro-1,1,1-trifluoropropane (HCFC-253fb)	98	No reports							
		99	No reports							
		00	No reports							
		01	No reports							
5598-13-0 *	Chlorpyrifos methyl	98	5	500	0	0	0	500	0	500
		99	4	10	0	0	0	10	24,197	24,207
		00	4	10	0	0	0	10	80,821	80,831
		01	2	0	0	0	0	0	0	0
64902-72-3 *	Chlorsulfuron	98	1	1	0	0	0	1	0	1
		99	1	1	0	0	0	1	0	1
		00	1	1	0	0	0	1	0	1
		01	1	1	0	0	0	1	0	1
7440-47-3	Chromium	98	2,114	713,379	38,281	260,457	15,823,485	16,835,601	14,527,534	31,363,136
		99	2,156	670,436	31,600	38,306	11,784,728	12,525,070	16,906,623	29,431,693
		00	2,146	517,613	13,926	348	6,547,140	7,079,026	8,048,482	15,127,508
		01	2,010	296,698	15,230	83,763	4,827,123	5,222,815	9,151,477	14,374,292

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information).

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
3-Chloropro-	98	No reports								
pionitrile	99	0	0	0	0	106,854	0	157	107,011	0
	00	0	0	0	0	55,812	0	0	55,812	0
	01	0	0	0	0	31,065	0	0	31,065	0
Chlorotetrafluoro-	98	0	0	0	0	29,571	0	0	29,571	0
ethane	99	0	0	0	0	47,355	0	129,800	177,155	0
	00	0	0	0	0	0	0	40,043	40,043	0
	01	0	0	0	0	36,829	0	0	36,829	0
1-Chloro-1,1,2,2-	98	0	0	0	0	165,890	0	23,136	189,026	0
tetrafluoroethane	99	0	0	0	0	457,049	0	59,325	516,374	0
(HCFC-124a)	00	0	0	0	0	680,013	0	48,729	728,742	0
	01	0	0	0	0	970,393	62,700	47,107	1,080,200	476
2-Chloro-1,1,1,2-	98	44,530	282,345	0	0	501,437	0	750,815	1,579,127	30
tetrafluoroethane	99	110,249	246,089	0	0	263,090	1,085	604,320	1,224,833	40
(HCFC-124)	00	135,092	346,497	0	0	445,998	0	580,653	1,508,240	371
	01	361,692	99,773	0	0	4,035,576	6,456	677,703	5,181,200	14,677
*,** Chlorothalonil	98	4,726	0	0	0	65,406	195,241	343,120	608,493	419
	99	25,082	0	0	0	77,915	149,720	285,866	538,583	1,614
	00	15,267	0	0	0	44,246	114,543	206,322	380,378	24
	01	13,720	0	0	0	53,916	505,497	505,766	1,078,899	931
** p-Chloro-o-	98	No reports								
toluidine	99	No reports								
	00	No reports								
	01	No reports								
2-Chloro-1,1,1-	98	0	0	0	0	33,000	0	162,925	195,925	4
trifluoroethane	99	0	0	0	0	250,000	0	23,700	273,700	0
(HCFC-133a)	00	0	0	0	0	310,000	3,600	77,500	391,100	0
	01	0	0	0	0	1,271,983	54,600	52,816	1,379,399	441
Chlorotrifluoro-	98	0	0	0	0	0	0	14,705	14,705	0
methane (CFC-13)	99	0	33,339	0	0	0	0	10,795	44,134	0
	00	0	18,000	0	0	57,159	0	17,106	92,265	0
	01	0	15,600	0	0	35,300	0	54,079	104,979	0
3-Chloro-1,1,1-	98	No reports								
trifluoropropane	99	No reports								
(HCFC-253fb)	00	No reports								
	01	No reports								
* Chlorpyrifos	98	2,000	0	0	0	0	4,990	285	7,275	0
methyl	99	4,000	0	0	0	0	0	8	4,008	0
	00	4,000	0	0	0	0	0	80,824	84,824	0
	01	0	0	0	0	0	0	0	0	0
* Chlorsulfuron	98	0	0	0	0	0	10,508	1	10,509	0
	99	0	0	0	0	0	2,221	1	2,222	0
	00	0	0	0	0	0	4,078	1	4,079	0
	01	0	0	0	0	0	650	1	651	0
Chromium	98	88,171,850	93,142,064	86,318	17,198	835,345	1,239,055	30,255,826	213,747,656	55,099
	99	28,740,065	99,011,362	0	1,555	468,411	1,048,208	24,573,633	153,843,234	3,888,698
	00	23,423,445	95,016,722	376,580	20	177,536	509,591	15,266,685	134,770,580	71,738
	01	16,371,912	90,302,380	0	5	114,307	169,234	13,540,474	120,498,312	2,499,500

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
--	**	Chromium compounds	98	1,852	628,699	228,657	1,542,550	93,054,932	95,454,838	19,513,222	114,968,060
			99	1,821	743,915	196,962	1,545,417	154,382,566	156,868,860	17,199,127	174,067,987
			00	1,874	732,845	225,209	3,502,875	125,027,704	129,488,633	19,786,183	149,274,816
			01	1,770	671,106	178,352	2,240,166	96,718,636	99,808,260	16,725,832	116,534,092
4680-78-8		C.I. Acid Green 3	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
6459-94-5	**	C.I. Acid Red 114	98	1	0	0	0	0	0	0	0
			99	1	0	0	0	0	0	0	0
			00	1	0	0	0	0	0	0	0
			01	No reports							
569-64-2	*	C.I. Basic Green 4	98	4	5	0	0	0	5	750	755
			99	1	0	0	0	0	0	0	0
			00	1	0	0	0	0	0	0	0
			01	No reports							
989-38-8		C.I. Basic Red 1	98	1	0	0	0	0	0	0	0
			99	2	0	0	0	0	0	0	0
			00	2	0	0	0	0	0	0	0
			01	1	0	0	0	0	0	0	0
1937-37-7	**	C.I Direct Black 38	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
28407-37-6		C.I. Direct Blue 218	98	6	0	10	0	5	15	2,142	2,157
			99	8	0	10	0	0	10	2,259	2,269
			00	8	0	20	0	1,704	1,724	3,848	5,572
			01	5	0	0	0	0	0	2,500	2,500
2602-46-2	**	C I. Direct Blue 6	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
16071-86-6	**	C.I. Direct Brown 95	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
2832-40-8		C.I. Disperse Yellow 3	98	3	205	25	0	0	230	876	1,106
			99	3	50	25	0	0	75	900	975
			00	3	31	25	0	0	56	450	506
			01	1	250	0	0	0	250	250	500
3761-53-3	**	C.I. Food Red 5	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
81-88-9		C.I. Food Red 15	98	2	0	0	0	0	0	0	0
			99	3	0	0	0	0	0	0	0
			00	4	0	0	0	23,886	23,886	0	23,886
			01	2	0	0	0	14,223	14,223	0	14,223

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information) For chromium compounds, applies only to chromium (VI) compounds

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

	Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
**	Chromium compounds	98	37,465,632	33,765,261	10,015	55,547	1,228,418	2,931,965	114,025,424	189,482,262	185,974
		99	27,144,022	36,832,948	2,000	64,829	8,889,310	1,494,501	131,580,698	206,008,308	44,444,962
		00	20,418,205	32,949,749	6,819	22,274	10,768,040	1,581,786	131,647,397	197,394,270	19,271,440
		01	13,650,741	27,868,512	5,052	26,501	2,463,858	843,012	117,396,576	162,254,252	378,943
	C.I. Acid Green 3	98	No reports								
		99	No reports								
		00	No reports								
		01	No reports								
**	C.I. Acid Red 114	98	0	0	0	0	0	0	0	0	0
		99	0	0	0	0	0	0	0	0	0
		00	0	0	0	0	0	0	0	0	0
		01	No reports								
*	C.I. Basic Green 4	98	0	0	0	0	0	998	20	1,018	0
		99	0	0	0	0	0	0	0	0	0
		00	0	0	0	0	0	0	0	0	0
		01	No reports								
	C.I. Basic Red 1	98	0	0	0	0	0	0	0	0	0
		99	0	0	0	0	0	0	0	0	0
		00	0	0	0	0	0	0	0	0	0
		01	0	0	0	0	0	0	0	0	0
**	C.I. Direct Black 38	98	No reports								
		99	No reports								
		00	No reports								
		01	No reports								
	C.I. Direct Blue 218	98	0	260	0	0	312	1,417	2,144	4,133	0
		99	0	450	0	0	53	1,622	2,262	4,387	0
		00	0	1,100	0	0	13,326	1,984	2,249	18,659	0
		01	0	550	0	0	0	1,352	2,461	4,363	0
**	C.I Direct Blue 6	98	No reports								
		99	No reports								
		00	No reports								
		01	No reports								
**	C.I. Direct Brown 95	98	No reports								
		99	No reports								
		00	No reports								
		01	No reports								
	C.I. Disperse Yellow 3	98	0	0	0	0	0	1,882	1,106	2,988	0
		99	0	0	0	0	0	0	950	950	0
		00	0	0	0	0	0	0	506	506	0
		01	0	0	0	0	0	0	347	347	0
**	C.I. Food Red 5	98	No reports								
		99	No reports								
		00	No reports								
		01	No reports								
	C.I. Food Red 15	98	0	0	0	0	0	0	0	0	0
		99	0	0	0	0	0	0	0	0	0
		00	0	0	0	0	0	0	23,886	23,886	0
		01	0	0	0	0	0	0	14,223	14,223	0

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
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** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information) For chromium compounds, applies only to chromium (VI) compounds

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
3118-97-6		C.I. Solvent Orange 7	98	No reports							
			99	1	0	0	0	0	0	0	0
			00	No reports							
			01	No reports							
97-56-3	**	C I. Solvent Yellow 3	98	1	0	0	0	0	0	0	0
			99	1	0	0	0	0	0	0	0
			00	1	0	0	0	0	0	0	0
			01	No reports							
842-07-9		C.I. Solvent Yellow 14	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
492-80-8	*,**	C I. Solvent Yellow 34	98	1	0	0	0	0	0	0	0
			99	3	5	0	0	0	5	157	162
			00	3	0	0	0	0	0	0	0
			01	3	0	0	0	0	0	0	0
128-66-5		C.I. Vat Yellow 4	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
7440-48-4	**	Cobalt	98	283	42,618	3,604	0	218,794	265,016	433,801	698,817
			99	264	25,450	5,600	0	88,918	119,968	320,379	440,347
			00	286	32,102	3,963	2	60,123	96,190	366,682	462,872
			01	284	24,612	3,123	0	575,946	603,681	379,638	983,319
--	**	Cobalt compounds	98	445	87,347	59,419	44,956	13,131,037	13,322,759	818,068	14,140,827
			99	448	95,211	83,774	47,422	14,818,816	15,045,223	924,994	15,970,217
			00	460	80,163	76,885	56,126	15,557,759	15,770,933	1,006,033	16,776,966
			01	444	64,496	47,966	35,530	14,065,530	14,213,522	1,244,198	15,457,720
7440-50-8	*	Copper	98	2,958	1,304,889	55,098	79,845	280,082,263	281,522,095	11,739,541	293,261,636
			99	2,915	2,081,923	36,445	62,372	14,617,580	16,798,320	11,817,202	28,615,521
			00	2,904	1,120,253	39,743	70,577	7,961,089	9,191,662	13,694,211	22,885,873
			01	2,811	821,838	46,559	53,846	10,168,637	11,090,881	8,268,966	19,359,847
--		Copper compounds	98	1,995	4,127,028	465,629	1,562,046	1,285,621,559	1,291,776,262	13,408,397	1,305,184,659
			99	2,001	2,073,439	361,587	1,521,336	1,752,494,687	1,756,451,049	13,979,051	1,770,430,100
			00	2,029	1,654,782	426,931	1,737,251	1,346,080,047	1,349,899,011	18,165,775	1,368,064,786
			01	1,994	1,416,114	418,663	894,183	998,260,861	1,000,989,821	17,096,211	1,018,086,032
8001-58-9	*,**	Creosote	98	92	782,351	24,842	0	2,188,743	2,995,936	1,148,219	4,144,155
			99	90	736,624	22,319	0	1,208,983	1,967,926	632,924	2,600,850
			00	93	704,754	24,824	0	218,856	948,434	1,057,402	2,005,836
			01	88	516,899	2,464	0	363,262	882,625	153,776	1,036,401
120-71-8	**	p-Cresidine	98	4	2,400	0	0	0	2,400	0	2,400
			99	3	1,730	410	0	0	2,140	0	2,140
			00	4	1,732	224	0	0	1,956	12,249	14,205
			01	3	1,080	0	0	0	1,080	0	1,080
108-39-4	*	m-Cresol	98	30	45,008	141	502,670	4,655	552,474	632	553,106
			99	31	42,008	671	401,261	3,096	447,036	1,034	448,070
			00	34	39,742	42	543,220	40	583,044	1,685	584,729
			01	30	51,458	85	420,377	0	471,920	1,275	473,195

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998).
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
C.I. Solvent Orange 7	98	No reports								
	99	0	0	0	0	0	0	0	0	0
	00	No reports								
	01	No reports								
** C.I. Solvent Yellow 3	98	0	0	0	0	0	0	0	0	0
	99	0	0	0	0	0	0	0	0	0
	00	0	0	0	0	0	0	0	0	0
	01	No reports								
C.I. Solvent Yellow 14	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
*,** C.I. Solvent Yellow 34	98	0	0	0	0	0	0	0	0	0
	99	0	0	0	0	129,504	0	162	129,666	0
	00	0	0	0	0	107,973	787	0	108,760	0
	01	0	0	330	1,440	78,458	82	0	80,310	0
C.I. Vat Yellow 4	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
** Cobalt	98	4,273,633	7,997,671	0	10,000	14,107	32,472	483,832	12,811,715	295
	99	4,539,554	8,001,583	0	0	5,886	14,217	332,657	12,893,897	23
	00	4,162,386	8,866,422	0	0	17,127	16,005	314,679	13,376,620	102
	01	2,451,508	7,410,832	0	0	817	1,259	924,297	10,788,713	17
** Cobalt compounds	98	191,148	1,675,930	0	7,985	1,470,626	37,272	14,146,663	17,529,624	5,594
	99	899,256	1,466,325	117	14,204	1,157,119	72,378	15,953,758	19,563,157	3,776
	00	2,017,554	1,536,193	0	6,203	1,631,672	28,329	16,726,356	21,946,307	576
	01	1,344,985	1,392,035	0	4,167	2,042,190	30,938	15,473,043	20,287,358	107,691
* Copper	98	541,603,543	597,026,473	189,372	499,061	45,035,980	1,454,516	290,400,181	1,476,209,126	952,169
	99	470,902,462	629,945,848	0	331	395,074	1,711,216	23,764,384	1,126,719,315	239,509
	00	647,751,933	673,495,116	49,383	188,811	474,319	3,894,570	20,908,127	1,346,762,258	1,623,598
	01	489,376,136	573,888,780	0	2,128	331,409	936,215	23,466,362	1,088,001,030	812,440
Copper compounds	98	191,659,753	154,893,102	0	23,292	3,257,445	1,999,760	1,302,895,172	1,654,728,524	4,446,894
	99	222,038,955	153,229,500	1,200	324,339	10,352,456	1,976,638	1,445,979,192	1,833,902,280	334,455,777
	00	209,361,243	162,903,053	0	18,278	868,138	1,982,553	1,210,558,828	1,585,692,093	164,178,605
	01	143,657,931	106,728,311	0	12,305	421,761	632,410	1,012,319,638	1,263,772,355	9,414,992
*,** Creosote	98	11,514,469	717,808	2,626,362	130,557	1,363,687	944,406	3,995,897	21,293,186	541,740
	99	6,427,378	696,540	2,144,276	163,477	1,923,025	1,051,957	2,539,931	14,946,584	519,697
	00	10,151,880	0	2,531,307	292,799	9,033,454	1,436,967	2,101,536	25,547,943	576,812
	01	6,692,859	0	4,100,330	767,402	7,686,962	614,207	1,075,810	20,937,570	288,687
** p-Cresidine	98	0	0	0	0	0	29,000	2,400	31,400	0
	99	0	0	0	0	1,106	5,700	1,387	8,193	0
	00	0	0	0	0	528	25,949	1,956	28,433	0
	01	0	0	0	0	0	4,019	1,080	5,099	0
* m-Cresol	98	1,769,226	1,064,540	649,489	64,402	281,132	8,216	554,577	4,391,582	719
	99	32,821	943,956	691,506	65,656	797,647	7,763	452,180	2,991,529	667
	00	1,398,437	1,660,747	686,588	22,475	843,146	8,353	587,133	5,206,879	94
	01	652,486	1,655,022	1,198,864	62,314	643,258	9,540	472,085	4,693,569	308

Note: Data from Section 8 (Current Year) of Form R

NR: not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	On-site Releases: Surface Water Discharges Pounds	On-site Releases: Underground Injection Pounds	On-site Releases: Releases to Land Pounds	On-site Releases: Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
95-48-7		o-Cresol	98	27	9,282	16	466,578	20	475,896	39,525	515,421
			99	32	11,776	20	381,626	11,790	405,212	3,417	408,629
			00	30	10,721	14	502,115	13	512,863	5,023	517,886
			01	28	6,163	20	391,737	7	397,927	762	398,689
106-44-5		p-Cresol	98	35	57,016	43	299,485	0	356,544	50,556	407,100
			99	36	44,966	423	245,084	68	290,541	33,106	323,647
			00	36	41,996	398	321,803	5	364,202	33,566	397,768
			01	32	46,684	38	251,649	0	298,371	10,526	308,897
1319-77-3	*	Cresol (mixed isomers)	98	169	1,563,084	8,625	417,783	24,856	2,014,348	19,813	2,034,161
			99	172	1,426,424	5,070	899,887	73,277	2,404,658	134,505	2,539,163
			00	176	1,289,382	6,023	732,846	69,732	2,097,983	95,446	2,193,429
			01	184	1,165,462	9,065	613,148	3,716	1,791,391	9,484	1,800,875
4170-30-3	*	Crotonaldehyde	98	7	29,584	3,800	1,300	0	34,684	0	34,684
			99	11	28,883	37,298	1,350	0	67,531	176	67,707
			00	12	24,628	36,838	1,400	10	62,876	10	62,886
			01	12	12,762	1,770	90	1	14,623	505	15,128
98-82-8		Cumene	98	411	1,396,582	665	1,040	35,854	1,434,141	33,544	1,467,685
			99	394	1,446,471	3,152	1,271	35,209	1,486,103	18,306	1,504,409
			00	380	1,300,260	665	642	46,413	1,347,980	98,072	1,446,052
			01	363	1,259,720	1,190	795	1,733	1,263,438	10,256	1,273,694
80-15-9		Cumene hydroperoxide	98	45	75,036	79	210,000	40,023	325,138	10,756	335,894
			99	52	63,403	120	330,000	40,023	433,546	24,178	457,724
			00	51	60,538	94	130,000	40,023	230,655	9,389	240,044
			01	45	41,416	100	69,000	0	110,516	6,458	116,974
135-20-6	**	Cupferron	98	1	0	0	0	0	0	0	0
			99	1	0	0	0	0	0	0	0
			00	2	0	343	0	0	343	0	343
			01	1	0	0	0	0	0	0	0
21725-46-2	*	Cyanazine	98	7	202	0	0	12,000	12,202	0	12,202
			99	3	144	0	0	81,464	81,608	0	81,608
			00	1	33	0	0	0	33	7,900	7,933
			01	4	12	0	0	39,754	39,766	505	40,271
--		Cyanide compounds	98	333	764,839	57,628	3,781,134	3,990,639	8,594,240	158,612	8,752,852
			99	313	957,013	70,468	3,478,749	2,497,983	7,004,213	83,670	7,087,883
			00	295	641,059	72,247	3,920,932	1,796,760	6,430,998	87,386	6,518,384
			01	282	480,029	102,668	3,949,978	2,809,960	7,342,635	26,631	7,369,266
1134-23-2	*	Cycloate	98	3	97	113	77	0	287	4	291
			99	3	625	113	89	0	827	684	1,511
			00	2	14	0	53	0	67	164	231
			01	1	0	0	0	0	0	0	0
110-82-7	*	Cyclohexane	98	583	6,331,898	13,749	356,858	1,608	6,704,113	68,085	6,772,198
			99	575	5,366,718	13,353	334,424	7,472	5,721,967	114,837	5,836,804
			00	577	4,912,875	18,086	296,644	4,118	5,231,723	49,922	5,281,645
			01	577	4,309,434	15,061	206,386	4,846	4,535,727	38,914	4,574,641
108-93-0	*	Cyclohexanol	98	30	300,667	298	4,307,800	0	4,608,765	1,503	4,610,268
			99	31	161,533	41	3,730,307	0	3,891,881	1,062	3,892,943
			00	36	146,930	4,983	3,867,623	311,600	4,331,136	4,857	4,335,993
			01	37	173,951	6,147	2,956,777	0	3,136,875	1,034	3,137,909

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
o-Cresol	98	95,701	0	339,395	46,742	265,533	17,724	516,778	1,281,873	376
	99	29,734	75	250,748	69,107	728,004	18,496	409,035	1,505,199	89
	00	101,940	0	255,956	75,292	676,737	4,341	516,682	1,630,948	65
	01	6,920	0	400,662	149,696	504,983	6,903	397,336	1,466,500	233
p-Cresol	98	83,138	654,268	449,080	122,235	1,214,690	54,263	408,678	2,986,352	280
	99	21,521	471,978	409,814	150,975	1,905,298	45,727	322,512	3,327,825	230
	00	12,896	817,983	547,928	129,287	1,945,694	5,971	397,627	3,857,386	150
	01	10,504	1,655,022	937,310	94,806	931,388	13,651	307,808	3,950,489	182
* Cresol (mixed isomers)	98	125,174	681,073	7,298,232	3,122,331	16,916,516	418,779	2,040,242	30,602,347	3
	99	288,823	816,203	5,770,024	3,305,210	18,526,087	337,950	2,578,585	31,622,882	1,707
	00	812,482	1,322,568	4,773,875	892,816	11,498,011	376,748	2,229,721	21,906,221	963
	01	783,546	727,533	3,120,954	717,469	11,854,496	609,310	1,798,977	19,612,285	398
* Crotonaldehyde	98	0	0	1,837,500	0	569,220	16	34,884	2,441,620	0
	99	0	0	1,823,660	7,492	1,508,161	1,552	67,099	3,407,964	0
	00	0	0	2,156,006	1,620	1,423,970	799	62,546	3,644,941	0
	01	0	0	1,617,918	7,381	330,762	95	14,513	1,970,669	0
Cumene	98	19,348,952	171,769	9,245,221	1,470,333	16,893,435	228,311	1,573,770	48,931,791	1,764
	99	21,371,054	82,596	5,593,591	1,761,187	13,243,924	145,579	1,571,600	43,769,531	543
	00	558,280,896	115,999	3,860,482	1,517,251	7,942,699	108,798	1,489,884	573,316,009	1,937
	01	817,515,105	122,530	5,041,374	1,276,359	7,167,513	132,066	1,315,128	832,570,075	3,467
Cumene hydroperoxide	98	0	0	0	1,066	399,343	278,331	333,832	1,012,572	0
	99	0	6	500	51,159	1,207,308	464,451	453,613	2,177,037	0
	00	0	0	400	798	1,557,155	371,483	239,164	2,169,000	0
	01	0	0	0	2,663	702,761	146,345	123,949	975,718	100
** Cupferron	98	0	0	13,228	659	0	0	0	13,887	0
	99	0	0	3,750	9,623	0	0	0	13,373	0
	00	0	0	15,075	0	3,432	0	343	18,850	0
	01	0	0	12,965	0	0	0	0	12,965	0
* Cyanazine	98	0	0	0	0	43,000	27,576	12,453	83,029	0
	99	0	0	0	0	0	75,400	157,031	232,431	0
	00	0	0	0	0	0	27,430	27,430	54,860	0
	01	0	0	0	0	28,576	12,910	40,194	81,680	0
Cyanide compounds	98	6,467,589	58,277	7,029,028	2,380	34,241,538	779,104	8,633,758	57,211,674	2,500
	99	1,559,117	24,093	5,174,351	147	25,228,314	1,080,231	7,144,343	40,210,596	52,368
	00	1,464,044	10,232	4,949,571	12,381	19,579,957	825,248	6,535,442	33,376,875	2,457
	01	1,394,137	33,789	4,557,346	2,604	24,388,231	762,211	7,375,880	38,514,198	5,636
* Cycloate	98	0	0	0	0	1,148	3,574	289	5,011	0
	99	0	0	0	0	1,097	2,054	600	3,751	1,652
	00	0	0	0	0	53	0	230	283	0
	01	0	0	0	0	0	0	0	0	0
* Cyclohexane	98	67,480,363	640,515	18,372,608	8,293,304	25,297,588	4,629,055	6,561,887	131,275,320	9,190
	99	44,316,651	1,025,390	15,678,779	4,690,406	25,920,813	2,318,811	5,854,091	99,804,941	177,184
	00	36,850,993	895,985	23,095,054	11,623,278	230,547,417	2,034,155	5,211,818	310,258,700	73,372
	01	20,014,561	325,021	16,990,560	8,749,306	22,507,761	1,337,862	4,946,877	74,871,948	24,106
* Cyclohexanol	98	0	0	3,021,113	75,805	162,781	104,240	4,649,094	8,013,033	0
	99	0	100	1,781,743	64,476	237,950	89,275	3,871,928	6,045,472	0
	00	0	2,170	3,097,376	169,351	467,955	97,320	4,039,779	7,873,951	0
	01	35,151	0	2,251,145	922,762	680,329	25,936	3,164,452	7,079,775	0

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports. No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	On-site Releases: Surface Water Discharges Pounds	On-site Releases: Underground Injection Pounds	On-site Releases: Releases to Land Pounds	On-site Releases: Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
68359-37-5	*	Cyfluthrin	98	3	4	1	0	0	5	0	5
			99	5	16	72	0	0	88	0	88
			00	3	3	22	0	0	25	0	25
			01	3	1	11	0	0	12	0	12
68085-85-8	*	Cyhalothrin	98	No reports							
			99	1	0	0	0	0	0	0	0
			00	1	0	0	0	0	0	0	0
			01	No reports							
94-75-7	*,**	2,4-D (acetic acid)	98	34	3,988	88	31,209	1,798	37,083	3,156	40,239
			99	35	7,913	74	22,290	1,798	32,075	11,906	43,981
			00	30	6,816	256	250	1,831	9,153	23,964	33,117
			01	28	2,247	13	250	1,509	4,019	9,597	13,616
533-74-4	*	Dazomet	98	14	0	0	0	0	0	1,274	1,274
			99	15	250	450	0	5	705	250	955
			00	19	2,792	600	13,515	0	16,907	0	16,907
			01	14	0	280	0	0	280	1,950	2,230
53404-60-7	*	Dazomet, sodium salt	98	2	0	0	0	0	0	0	0
			99	2	0	0	0	0	0	0	0
			00	2	0	0	0	0	0	0	0
			01	2	0	0	0	0	0	0	0
94-82-6	*	2,4-DB	98	3	17	0	0	0	17	0	17
			99	2	17	0	0	0	17	0	17
			00	3	20	0	0	0	20	0	20
			01	2	17	0	0	0	17	0	17
1929-73-3	*,**	2,4-D butoxyethyl ester	98	2	255	0	0	0	255	0	255
			99	3	255	0	0	0	255	0	255
			00	4	255	0	0	0	255	0	255
			01	3	4,900	0	0	0	4,900	0	4,900
94-80-4	*,**	2,4-D butyl ester	98	2	1	0	0	0	1	0	1
			99	2	0	1	0	0	1	0	1
			00	2	4	1	0	0	5	0	5
			01	2	1,201	1	0	0	1,202	0	1,202
2971-38-2	**	2,4-D chlorocrotyl ester	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
1163-19-5		Decabromodiphenyl oxide	98	147	31,114	3,168	0	501,253	535,535	756,054	1,291,589
			99	149	116,241	2,701	0	746,169	865,111	894,293	1,759,404
			00	154	106,262	9,006	0	888,246	1,003,514	989,139	1,992,653
			01	142	97,198	6,471	0	545,872	649,541	787,927	1,437,468
13684-56-5	*	Desmedipham	98	1	94	0	0	0	94	0	94
			99	1	62	0	0	0	62	0	62
			00	1	52	0	0	0	52	0	52
			01	No reports							
1928-43-4	*,**	2,4-D 2-Ethylhexyl ester	98	10	4,722	5	0	0	4,727	1,735	6,462
			99	10	4,672	5	0	0	4,677	927	5,604
			00	10	4,237	0	0	0	4,237	250	4,487
			01	9	2,311	0	0	0	2,311	750	3,061

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
* Cyfluthrin	98	0	0	0	0	19,412	964	5	20,381	0
	99	0	0	0	0	16,807	1,623	83	18,513	0
	00	0	0	0	0	14,245	790	25	15,060	0
	01	0	0	0	0	12,750	1,313	11	14,074	0
* Cyhalothrin	98	No reports								
	99	0	0	0	0	0	0	0	0	0
	00	0	0	0	0	0	0	0	0	0
	01	No reports								
*,**2,4-D (acetic acid)	98	87,757	0	0	11	236,875	59,436	40,156	424,235	0
	99	94,815	0	0	0	504,552	63,712	48,304	711,383	0
	00	15,559	0	0	769	553,647	30,092	39,139	639,206	0
	01	12,447	0	0	31	632,771	45,258	11,360	701,867	0
* Dazomet	98	0	0	0	0	100	2,100	1,400	3,600	0
	99	0	0	0	0	13,093	9,803	602	23,498	0
	00	0	0	0	0	40,100	20,671	16,915	77,686	0
	01	0	0	0	0	4,048	7,884	464	12,396	0
* Dazomet, sodium salt	98	0	0	0	0	73	12,620	90	12,783	0
	99	0	0	0	0	38	12,165	4	12,207	0
	00	0	0	0	0	72	12,060	8	12,140	0
	01	0	0	0	0	38	4,605	4	4,647	0
* 2,4-DB	98	0	0	0	21,140	0	14	17	21,171	0
	99	0	0	0	0	0	8	17	25	0
	00	0	0	0	0	0	19	10	29	0
	01	0	0	0	0	0	57	17	74	0
*,**2,4-D butoxyethyl ester	98	0	0	0	0	0	0	76	76	0
	99	0	0	0	0	0	0	26	26	0
	00	0	0	0	0	0	0	89	89	0
	01	0	0	0	0	0	0	4,500	4,500	0
*,**2,4-D butyl ester	98	0	0	0	0	9,400	0	1	9,401	0
	99	0	0	0	0	11,000	0	1	11,001	0
	00	0	0	0	0	11,900	0	4	11,904	0
	01	0	0	0	0	12	0	1,202	1,214	0
** 2,4-D chlorocrotyl ester	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
Decabromodiphenyl oxide	98	264,731	88,843	385	3,214	43,588	262,535	1,261,455	1,924,751	0
	99	368,187	29,609	6,600	8,732	88,196	389,557	1,721,004	2,611,885	0
	00	342,183	234,295	0	8,927	123,853	294,412	1,929,954	2,933,624	26
	01	322,244	90,890	0	6,602	44,688	280,374	1,505,826	2,250,624	5,763
* Desmedipham	98	0	0	0	0	0	1,150	94	1,244	0
	99	0	0	0	0	0	691	62	753	0
	00	0	0	0	0	0	205	52	257	0
	01	No reports								
*,**2,4-D 2-Ethylhexyl ester	98	7,870	0	0	0	0	14,179	6,334	28,383	0
	99	13,250	0	0	0	0	9,898	6,150	29,298	0
	00	21,312	0	0	0	0	9,956	4,933	36,201	0
	01	5,175	0	0	0	0	2,802	3,072	11,049	0

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports. No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
53404-37-8	*,**	2,4-D 2-Ethyl-4-methylpentyl ester	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
2303-16-4	*	Diallate	98	1	0	0	0	0	0	0	0
			99	3	7	1	0	0	8	170	178
			00	3	6	0	0	0	6	10	16
			01	3	6	0	0	0	6	260	266
615-05-4	**	2,4-Diamino-anisole	98	No reports							
			99	No reports							
			00	No reports							
			01	1	0	0	0	0	0	0	0
39156-41-7	**	2,4-Diamino-anisole sulfate	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
101-80-4	**	4,4'-Diaminodi-phenyl ether	98	3	22	340	0	0	362	55	417
			99	3	169	449	0	0	618	41	659
			00	3	336	359	0	0	695	0	695
			01	3	246	361	0	0	607	0	607
95-80-7	**	2,4-Diamino-toluene	98	5	1,959	0	0	0	1,959	54,062	56,021
			99	6	664	0	0	0	664	774	1,438
			00	5	470	0	0	0	470	127	597
			01	8	953	5	0	0	958	500	1,458
25376-45-8	**	Diaminotoluene (mixed isomers)	98	15	13,533	5,785	13,000	205	32,523	12,531	45,054
			99	17	10,668	28,634	6,200	14	45,516	16,942	62,458
			00	18	9,216	1,929	23,000	13	34,158	9,413	43,571
			01	18	11,022	5,934	13,000	5	29,961	16,455	46,416
333-41-5	*	Diazinon	98	34	13,579	11	0	0	13,590	2,112	15,702
			99	37	26,547	13	0	0	26,560	2,401	28,961
			00	34	13,109	1,313	0	0	14,422	2,326	16,748
			01	34	7,998	14	0	0	8,012	2,603	10,615
334-88-3		Diazomethane	98	No reports							
			99	1	4	0	0	0	4	0	4
			00	No reports							
			01	No reports							
132-64-9		Dibenzofuran	98	44	94,230	29	0	56,670	150,929	13,304	164,233
			99	39	57,747	20	0	40	57,807	16,837	74,644
			00	45	33,392	16	0	0	33,408	11,370	44,778
			01	44	16,918	13	0	2	16,933	42,902	59,835
96-12-8	*,**	1,2-Dibromo-3-chloropropane	98	1	0	0	0	0	0	0	0
			99	1	0	0	0	0	0	6	6
			00	2	6	0	0	0	6	10	16
			01	2	6	0	0	0	6	505	511
106-93-4	*,**	1,2-Dibromo-ethane	98	14	12,858	6	0	1	12,865	0	12,865
			99	16	12,019	12	0	7	12,038	35,519	47,557
			00	19	12,827	11	69	0	12,907	1,834	14,741
			01	16	10,428	6	0	0	10,434	260	10,694

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
*,**2,4-D 2-Ethyl-4-methylpentyl ester	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
* Diallate	98	0	0	0	0	0	0	0	0	0
	99	0	0	0	0	176,396	0	175	176,571	0
	00	0	0	0	0	149,555	773	11	150,339	0
	01	0	0	0	371	149,129	20	77	149,597	0
** 2,4-Diamino-anisole	98	No reports								
	99	No reports								
	00	No reports								
	01	0	0	0	0	0	0	0	0	0
** 2,4-Diamino-anisole sulfate	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
** 4,4'-Diaminodi-phenyl ether	98	0	0	0	0	140	4,483	357	4,980	0
	99	0	0	0	0	62	138	613	813	0
	00	0	0	0	0	158	6,798	695	7,651	0
	01	0	0	0	0	125	4,367	607	5,099	0
** 2,4-Diamino-toluene	98	0	0	0	0	107,940	162,547	56,018	326,505	0
	99	0	0	0	0	787,673	0	1,419	789,092	0
	00	0	0	0	0	538,639	250	846	539,735	0
	01	0	0	0	0	809,064	27	876	809,967	0
** Diaminotoluene (mixed isomers)	98	0	0	2,714,193	4,298,060	1,631,064	1,072,322	44,237	9,759,876	255
	99	0	82,392	2,202,232	9,084,481	1,559,794	519,486	74,334	13,522,719	9
	00	0	0	2,815,016	10,033,437	2,265,882	911,084	41,851	16,067,270	12
	01	0	0	2,197,662	10,964,906	1,479,427	836,656	45,142	15,523,793	0
* Diazinon	98	53,095	0	0	0	218,685	33,653	15,180	320,613	0
	99	63,631	97	0	0	381,264	57,255	26,818	529,065	0
	00	27,782	0	0	0	394,144	66,248	16,723	504,897	0
	01	32,498	0	0	0	184,531	47,662	10,151	274,842	0
Diazomethane	98	No reports								
	99	0	0	0	0	232	0	4	236	0
	00	No reports								
	01	No reports								
Dibenzofuran	98	131,734	4,920	475	1,445,541	61,261	5,981	119,647	1,769,559	1,300
	99	109,749	1,450	10,545	96,365	109,570	1,885	77,461	407,025	0
	00	182,354	290	0	23,827	107,047	53,569	43,968	411,055	0
	01	148,249	90,731	13,000	23,043	122,763	1,777	55,792	455,355	3,168
*,** 1,2-Dibromo-3-chloropropane	98	0	0	0	0	0	0	0	0	0
	99	0	0	0	0	29,000	0	3	29,003	0
	00	0	0	0	0	40,411	775	7	41,193	0
	01	0	0	0	0	40,892	390	265	41,547	0
*,** 1,2-Dibromo-ethane	98	0	0	0	8,701	35,054	863	12,699	57,317	0
	99	0	0	0	120,000	125,564	58,073	12,133	315,770	791
	00	87	0	20,180	156,034	122,649	3,575	12,393	314,918	22
	01	57	2,109	0	4,831	126,389	7,260	10,772	151,418	0

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	On-site Releases: Surface Water Discharges Pounds	On-site Releases: Underground Injection Pounds	On-site Releases: Releases to Land Pounds	On-site Releases: Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
124-73-2		Dibromotetra-fluoroethane (Halon 2402)	98	1	10	0	0	0	10	0	10
			99	1	0	0	0	0	0	0	0
			00	1	0	0	0	0	0	0	0
			01	1	615	0	0	0	615	0	615
84-74-2	*	Dibutyl phthalate	98	171	34,411	206	210,000	5,480	250,097	26,236	276,333
			99	188	36,732	279	290,000	33,301	360,312	50,348	410,660
			00	192	89,328	131	150,250	26,460	266,169	23,449	289,618
			01	171	27,414	170	60,005	55,097	142,686	29,349	172,035
1918-00-9	*	Dicamba	98	11	1,217	59	32,000	0	33,276	2,177	35,453
			99	15	1,261	37	18,600	0	19,898	227	20,125
			00	18	1,163	6	4,500	0	5,669	227	5,896
			01	17	1,033	5	8,500	0	9,538	3,373	12,911
99-30-9	*	Dichloran	98	4	0	0	0	0	0	0	0
			99	4	0	0	0	0	0	0	0
			00	3	0	0	0	0	0	0	0
			01	2	0	0	0	0	0	0	0
95-50-1	*	1,2-Dichloro-benzene	98	46	209,499	2,357	3,805	1,245	216,906	6,686	223,592
			99	45	310,278	2,070	2,500	66,068	380,916	9,486	390,402
			00	41	121,147	1,206	1,850	778	124,981	10,342	135,323
			01	45	123,723	832	4,805	0	129,360	1,152	130,512
541-73-1		1,3-Dichloro-benzene	98	8	4,023	203	0	0	4,226	0	4,226
			99	10	3,649	808	0	0	4,457	30	4,487
			00	13	6,077	210	0	0	6,287	484	6,771
			01	8	1,102	578	0	0	1,680	1,006	2,686
106-46-7	*,**	1,4-Dichloro-benzene	98	30	182,316	1,706	3,100	460	187,582	81	187,663
			99	29	178,254	1,881	7,300	1,370	188,805	18	188,823
			00	25	117,884	1,198	8,201	181	127,464	268	127,732
			01	24	81,071	1,134	9,780	4	91,989	1,517	93,506
25321-22-6	**	Dichlorobenzene (mixed isomers)	98	14	14,537	250	0	0	14,787	1,506	16,293
			99	12	13,848	0	0	0	13,848	357	14,205
			00	12	10,411	0	0	0	10,411	751	11,162
			01	9	7,308	0	0	0	7,308	1,197	8,505
91-94-1	**	3,3'-Dichloro-benzidine	98	4	261	0	0	0	261	41,600	41,861
			99	6	20	0	0	0	20	44,306	44,326
			00	5	27	0	0	0	27	24,005	24,032
			01	4	15	5	100,000	0	100,020	462	100,482
612-83-9	**	3,3'-Dichloro-benzidine dihydrochloride	98	16	250	5	0	0	255	6,790	7,045
			99	16	7	5	0	0	12	3,400	3,412
			00	16	16	5	0	0	21	2,300	2,321
			01	15	21	5	0	0	26	7,200	7,226
64969-34-2	**	3,3'-Dichloro-benzidine sulfate	98	1	0	0	0	0	0	260	260
			99	1	0	0	0	0	0	0	0
			00	1	0	0	0	0	0	0	0
			01	No reports							
75-27-4	**	Dichlorobromo-methane	98	1	2,370	0	0	90	2,460	0	2,460
			99	2	3,405	0	0	80	3,485	0	3,485
			00	3	5,074	0	0	168	5,242	0	5,242
			01	1	5,024	0	0	218	5,242	0	5,242

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

	Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
	Dibromotetra-	98	127,308	0	0	0	0	0	10	127,318	0
	fluoroethane	99	130,692	0	0	0	0	0	0	130,692	0
	(Halon 2402)	00	139,173	0	0	0	0	0	0	139,173	0
		01	175,493	0	0	0	0	0	615	176,108	0
*	Dibutyl phthalate	98	12,100	12,207	1,028,453	500,225	267,566	96,999	280,871	2,198,421	0
		99	27,022	5,499	913,586	203,247	684,862	189,335	391,486	2,415,037	531
		00	6,480	7,055	545,460	229,203	801,851	104,352	284,353	1,978,754	0
		01	7,395	34,269	447,860	173,117	679,546	121,066	166,429	1,629,682	0
*	Dicamba	98	0	0	0	0	59,780	65,900	35,453	161,133	0
		99	0	0	0	0	66,973	42,080	20,129	129,182	0
		00	0	0	0	0	83,861	8,214	6,840	98,915	0
		01	2,000	0	0	31	107,385	2,015	10,103	121,534	0
*	Dichloran	98	0	0	0	0	39,948	0	0	39,948	0
		99	0	0	0	0	55,619	0	0	55,619	0
		00	0	0	0	0	0	0	0	0	0
		01	0	0	0	0	0	0	0	0	0
*	1,2-Dichloro-	98	14,226,697	2,222,086	1,395,694	555,964	1,028,398	5,213,069	218,076	24,859,984	64
	benzene	99	13,599,130	1,378,067	3,964,446	590,007	2,017,015	1,811,188	394,733	23,754,586	311
		00	13,757,219	968	3,373,373	960,279	2,118,769	880,777	135,641	21,227,026	29
		01	9,927,305	796,731	443,958	883,341	2,242,479	1,139,571	137,669	15,571,054	10
	1,3-Dichloro-	98	1,988	950	0	0	20,087	2,757	4,261	30,043	1
	benzene	99	2,129	930	68,399	0	268,451	3,169	4,476	347,554	5
		00	10,193	930	25,323	0	325,581	48,552	6,405	416,984	1
		01	1,628	4,742	2,754	1,523	421,413	113	2,101	434,274	0
*,**	1,4-Dichloro-	98	2,638,621	0	134,273	155,941	378,101	300,875	186,236	3,794,047	108
	benzene	99	1,955,834	0	416,356	11,008	676,831	390,803	188,384	3,639,216	49,309
		00	1,871,164	0	0	1,824	634,738	350,963	126,667	2,985,356	27
		01	1,501,238	17,634	16,163	1,541	922,298	125,058	91,612	2,675,544	0
**	Dichlorobenzene	98	0	4,724	193,157	712,902	569,234	7,048	16,075	1,503,140	0
	(mixed isomers)	99	0	0	1,567,613	665,533	207,958	13,402	13,950	2,468,456	11
		00	0	0	249,490	856,897	415,813	6,641	10,454	1,539,295	1,210
		01	0	0	662,063	915	660,446	2,741	7,598	1,333,763	3,700
**	3,3'-Dichloro-	98	0	0	0	0	75,021	45,063	42,002	162,086	0
	benzidine	99	0	0	0	0	248,850	64,065	44,164	357,079	0
		00	0	0	0	150,000	213,901	24,785	19,018	407,704	1
		01	0	0	330	1,335	153,962	87	100,042	255,756	0
**	3,3'-Dichloro-	98	0	0	0	0	6,716	48,000	6,801	61,517	0
	benzidine	99	0	0	0	0	4,644	85,002	3,402	93,048	0
	dihydrochloride	00	0	0	0	17,000	7,077	37,400	2,303	63,780	0
		01	0	0	0	0	1,160	120,044	7,204	128,408	0
**	3,3'-Dichloro-	98	0	0	0	0	0	6,000	260	6,260	0
	benzidine	99	0	0	0	0	0	12,000	0	12,000	0
	sulfate	00	0	0	0	6,800	0	5,700	0	12,500	0
		01	No reports								
**	Dichlorobromo-	98	0	0	0	0	0	0	2,400	2,400	0
	methane	99	0	0	0	0	470	4	3,501	3,975	0
		00	0	0	0	0	7,870	0	5,162	13,032	0
		01	0	0	0	0	1,741	0	5,242	6,983	0

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports: No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
764-41-0		1,4-Dichloro-2-butene	98	5	1,713	0	5,700	0	7,413	0	7,413
			99	5	936	1	1,200	0	2,137	4	2,141
			00	7	1,165	0	1,100	0	2,265	5	2,270
			01	5	783	0	3,700	0	4,483	0	4,483
110-57-6		trans-1,4-Dichloro-2-butene	98	1	1	0	0	0	1	0	1
			99	3	256	0	0	0	256	158	414
			00	2	255	0	0	0	255	0	255
			01	2	271	0	0	0	271	0	271
1649-08-7		1,2-Dichloro-1,1-difluoroethane (HCFC-132b)	98	3	842	48	0	0	890	0	890
			99	3	17,320	45	0	0	17,365	5	17,370
			00	3	9,235	45	0	0	9,280	5	9,285
			01	6	7,640	26	0	0	7,666	500	8,166
75-71-8	*	Dichlorodifluoromethane (CFC-12)	98	61	753,592	13,005	250	0	766,847	107	766,954
			99	51	736,328	6	0	0	736,334	8,700	745,034
			00	44	553,111	6	0	0	553,117	1	553,118
			01	42	322,731	5	0	0	322,736	0	322,736
107-06-2	*,**	1,2-Dichloroethane	98	91	710,621	2,608	58,994	886	773,109	128,872	901,981
			99	89	548,798	904	65,465	2,983	618,150	667,994	1,286,144
			00	93	525,356	839	171,423	2,271	699,889	412,266	1,112,155
			01	92	446,854	2,227	13,463	141	462,685	14,464	477,149
540-59-0		1,2-Dichloroethylene	98	18	6,209	44	0	0	6,253	387	6,640
			99	17	6,440	391	0	0	6,831	13,282	20,113
			00	18	4,945	585	0	0	5,530	644	6,174
			01	16	5,102	232	0	0	5,334	513	5,847
1717-00-6		1,1-Dichloro-1-fluoroethane (HCFC-141b)	98	247	8,047,118	54	0	30,256	8,077,428	232,021	8,309,449
			99	242	8,040,399	419	0	23,955	8,064,773	305,309	8,370,082
			00	246	8,075,991	173	0	25,843	8,102,007	296,243	8,398,249
			01	231	7,410,272	665	0	24,816	7,435,753	250,601	7,686,354
75-43-4		Dichlorofluoromethane (HCFC-21)	98	7	129,471	0	0	0	129,471	8,984	138,455
			99	6	128,664	0	0	75,231	203,895	10,910	214,805
			00	7	123,314	0	0	37,076	160,390	10,570	170,960
			01	7	125,047	0	0	16,893	141,940	18,450	160,390
75-09-2	*,**	Dichloromethane	98	845	40,924,485	15,754	490,664	183,719	41,614,622	362,757	41,977,379
			99	710	35,654,617	12,072	166,859	61,949	35,895,497	538,474	36,433,971
			00	641	30,932,028	10,292	199,809	838,113	31,980,242	356,192	32,336,434
			01	565	21,557,347	4,895	218,992	63,523	21,844,757	372,694	22,217,451
127564-92-5		Dichloropentafluoropropane	98	1	6,520	0	0	0	6,520	8,900	15,420
			99	1	9,890	0	0	0	9,890	4,600	14,490
			00	1	11,560	0	0	0	11,560	4,600	16,160
			01	1	7,890	0	0	0	7,890	0	7,890
13474-88-9		1,1-Dichloro-1,2,2,3,3-pentafluoropropane (HCFC-225cc)	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
111512-56-2		1,1-Dichloro-1,2,3,3,3-pentafluoropropane (HCFC-225eb)	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
1,4-Dichloro-2-butene	98	1,800,000	0	150,000	0	3,753,000	124,000	7,413	5,834,413	0
	99	0	0	170,000	0	5,860,000	13,390	2,136	6,045,526	0
	00	0	0	170,000	0	7,061,972	106,778	2,071	7,340,821	0
	01	1,832,478	0	2,002,904	66,107	2,923,029	918	4,483	6,829,919	0
trans-1,4-Dichloro-2-butene	98	0	0	0	0	12,000	0	1	12,001	0
	99	0	0	0	0	142,737	0	206	142,943	0
	00	0	0	0	0	101,587	0	86	101,673	0
	01	0	0	0	0	100,322	0	111	100,433	0
1,2-Dichloro-1,1-difluoroethane (HCFC-132b)	98	0	0	0	0	359,584	61,573	883	422,040	0
	99	0	0	0	0	397,318	91,532	17,012	505,862	0
	00	0	0	0	15,735	615,032	78,758	9,229	718,754	0
	01	0	0	0	3,200	325,535	243,250	7,903	579,888	0
* Dichlorodifluoromethane (CFC-12)	98	80,253	213,260	0	0	238,680	79,132	769,333	1,380,658	0
	99	246,309	178,692	0	0	292,704	142,971	676,647	1,537,323	10,653
	00	260,863	155,985	0	0	204,478	161,465	552,728	1,335,519	196
	01	14,400	168,496	0	0	114,488	133,661	323,036	754,081	996
*,** 1,2-Dichloroethane	98	435,903,074	11,350,396	55,200,316	195,180	61,010,058	1,892,068	895,412	566,446,504	69,874
	99	397,978,130	14,982,020	35,620,845	313,672	79,020,126	2,282,295	1,142,883	531,339,971	11,336
	00	434,205,728	12,290,493	39,223,474	348,322	292,691,833	2,415,025	1,133,497	782,308,372	19,860
	01	430,010,562	2,343,199	34,886,848	750,931	90,547,449	2,855,698	465,782	561,860,469	21,893
1,2-Dichloroethylene	98	1,560,000	1,617,199	621,000	0	10,059,750	2,803	6,228	13,866,980	143
	99	4,505,988	1,463,455	313,000	411,928	16,047,134	7,235	8,790	22,757,530	131
	00	485,971	345,271	311,600	337,796	11,570,880	6,608	4,748	13,062,874	1,972
	01	1,479,159	381,609	701,674	0	8,489,308	1,024	5,249	11,058,023	1,223
1,1-Dichloro-1-fluoroethane (HCFC-141b)	98	512,035	150,881	0	660,808	1,073,051	426,221	8,098,260	10,921,256	75,867
	99	451,201	190,488	0	753,110	1,232,526	878,562	8,393,405	11,899,292	0
	00	640,124	177,464	2,121	577,931	1,819,141	1,111,926	8,305,839	12,634,546	0
	01	483,105	114,778	0	736,852	1,916,729	578,979	7,673,236	11,503,679	16,415
Dichlorofluoromethane (HCFC-21)	98	0	0	0	0	288,607	5,670	138,080	432,357	0
	99	0	0	0	0	38,313	13,104	214,889	266,306	0
	00	0	0	0	0	44,583	228	170,962	215,773	0
	01	0	0	0	0	15,251	70	160,390	175,711	0
*,** Dichloromethane	98	154,690,500	17,314,148	8,886,403	8,424,575	29,483,483	21,628,039	41,912,573	282,339,721	102,756
	99	160,894,551	12,572,004	7,939,444	14,920,166	460,936,627	23,744,482	35,861,875	716,869,149	705,957
	00	148,861,173	11,166,827	7,036,415	16,092,895	109,761,046	22,509,120	31,848,625	347,276,101	805,390
	01	168,292,828	12,100,129	7,763,028	13,413,286	33,726,939	22,490,895	22,394,732	280,181,837	34,114
Dichloropentafluoropropane	98	0	0	0	0	0	8,900	6,500	15,400	0
	99	0	0	0	0	0	4,600	9,900	14,500	0
	00	0	0	0	0	0	4,600	11,000	15,600	0
	01	0	0	0	0	0	4,900	7,800	12,700	0
1,1-Dichloro-1,2,2,3,3-pentafluoropropane (HCFC-225cc)	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
1,1-Dichloro-1,2,3,3,3-pentafluoropropane (HCFC-225eb)	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number	Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
422-44-6	1,2-Dichloro-	98	No reports							
	1,1,2,3,3-penta-	99	No reports							
	fluoropropane	00	No reports							
	(HCFC-225bb)	01	No reports							
431-86-7	1,2-Dichloro-	98	No reports							
	1,1,3,3,3-penta-	99	No reports							
	fluoropropane	00	No reports							
	(HCFC-225da)	01	No reports							
507-55-1	1,3-Dichloro-	98	4	70,043	0	0	0	70,043	0	70,043
	1,1,2,2,3-penta-	99	3	43,310	0	0	0	43,310	0	43,310
	fluoropropane	00	2	23,573	0	0	0	23,573	0	23,573
	(HCFC-225cb)	01	1	11,578	0	0	0	11,578	0	11,578
136013-79-1	1,3-Dichloro-	98	No reports							
	1,1,2,3,3-penta-	99	No reports							
	fluoropropane	00	No reports							
	(HCFC-225ea)	01	No reports							
128903-21-9	2,2-Dichloro-	98	No reports							
	1,1,1,3,3-penta-	99	No reports							
	fluoropropane	00	No reports							
	(HCFC-225aa)	01	No reports							
422-48-0	2,3-Dichloro-	98	No reports							
	1,1,1,2,3-penta-	99	No reports							
	fluoropropane	00	No reports							
	(HCFC-225ba)	01	No reports							
422-56-0	3,3-Dichloro-	98	4	57,258	0	0	0	57,258	0	57,258
	1,1,1,2,2-penta-	99	3	36,012	0	0	0	36,012	0	36,012
	fluoropropane	00	2	18,693	0	0	0	18,693	0	18,693
	(HCFC-225ca)	01	1	8,700	0	0	0	8,700	0	8,700
97-23-4 *	Dichlorophene	98	No reports							
		99	No reports							
		00	No reports							
		01	No reports							
120-83-2	2,4-Dichloro-	98	8	598	0	9,000	0	9,598	0	9,598
	phenol	99	7	522	31	9,700	1	10,254	19	10,273
		00	6	854	51	5,700	0	6,605	10	6,615
		01	6	506	30	6,600	1	7,137	3,799	10,936
78-87-5 *	1,2-Dichloro-	98	15	298,158	1,122	0	32	299,312	267	299,579
	propane	99	15	249,678	9,243	0	30	258,951	6,869	265,820
		00	17	264,196	436	5	382	265,019	16	265,035
		01	16	161,015	458	0	6,608	168,081	6,407	174,488
10061-02-6 **	trans-1,3-Dichloro-	98	4	1,740	0	0	1	1,741	0	1,741
	propene	99	7	597	0	0	0	597	0	597
		00	7	621	0	0	0	621	0	621
		01	7	777	0	0	6,372	7,149	3,115	10,264
78-88-6 *	2,3-Dichloro-	98	6	644	490	0	0	1,134	1,200	2,334
	propene	99	5	357	900	0	0	1,257	0	1,257
		00	5	315	290	0	200	805	0	805
		01	4	5,451	356	0	0	5,807	0	5,807

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
1,2-Dichloro-	98	No reports								
1,1,2,3,3-penta-	99	No reports								
fluoropropane	00	No reports								
(HCFC-225bb)	01	No reports								
1,2-Dichloro-	98	No reports								
1,1,3,3,3-penta-	99	No reports								
fluoropropane	00	No reports								
(HCFC-225da)	01	No reports								
1,3-Dichloro-	98	4,747	500	0	0	0	0	70,318	75,565	7,000
1,1,2,2,3-penta-	99	39,675	450	0	390	0	1,700	43,160	85,375	0
fluoropropane	00	12,000	6,914	0	4	0	0	23,555	42,473	0
(HCFC-225cb)	01	8,675	0	0	0	0	0	11,578	20,253	0
1,3-Dichloro-	98	No reports								
1,1,2,3,3-penta-	99	No reports								
fluoropropane	00	No reports								
(HCFC-225ea)	01	No reports								
2,2-Dichloro-	98	No reports								
1,1,1,3,3-penta-	99	No reports								
fluoropropane	00	No reports								
(HCFC-225aa)	01	No reports								
2,3-Dichloro-	98	No reports								
1,1,1,2,3-penta-	99	No reports								
fluoropropane	00	No reports								
(HCFC-225ba)	01	No reports								
3,3-Dichloro-	98	3,851	410	0	0	0	0	57,598	61,859	5,700
1,1,1,2,2-penta-	99	32,023	365	0	400	0	1,400	36,053	70,241	0
fluoropropane	00	10,000	4,061	0	4	0	0	18,679	32,744	0
(HCFC-225ca)	01	9,500	0	0	840	0	0	8,700	19,040	0
* Dichlorophene	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
2,4-Dichloro-	98	1,400	0	3	48,026	216,217	600	9,543	275,789	0
phenol	99	1,100	0	0	8,497	332,164	181	10,215	352,157	0
	00	920	0	3	0	339,880	872	6,651	348,326	0
	01	1,000	0	331	931	325,168	94	10,966	338,490	0
* 1,2-Dichloro-	98	26,800,000	0	10,700,000	0	16,299,727	1,161,438	301,905	55,263,070	10
propane	99	9,200,000	0	5,109,000	2	22,761,986	3,604,795	260,926	40,936,709	10
	00	84,350,000	52	15,981,364	93,118	196,097,715	344,834	266,610	297,133,693	0
	01	5,923,803	19	34,756,655	336,304	14,175,658	796,011	172,713	56,161,163	0
** trans-1,3-Dichloro-	98	7,900	0	5,210,238	9	20,505	430	1,710	5,240,792	0
propene	99	50,000	0	0	180	6,845,015	242	595	6,896,032	0
	00	36,000	0	11,328	360	20,005	1,911	621	70,225	0
	01	20,135	0	28,031	26	6,446	2,409	10,888	67,935	0
* 2,3-Dichloro-	98	960,000	0	1,100,000	0	712,306	1,086,000	1,134	3,859,440	0
propene	99	2,300,000	0	0	0	3,670,000	410,000	1,290	6,381,290	0
	00	3,200,000	0	2,217,065	3	6,800,000	330	550,806	12,768,204	0
	01	562,512	0	7,055,017	0	790,287	400,000	5,813	8,813,629	1

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	On-site Releases: Surface Water Discharges Pounds	On-site Releases: Underground Injection Pounds	On-site Releases: Releases to Land Pounds	On-site Releases: Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
542-75-6	*,**	1,3-Dichloro-propylene	98	18	11,566	61	0	1	11,628	0	11,628
			99	20	6,600	68	0	0	6,668	168	6,836
			00	19	10,295	288	2	200	10,785	10	10,795
			01	19	13,062	460	0	0	13,522	505	14,027
76-14-2	*	Dichlorotetra-fluoroethane (CFC-114)	98	14	827,613	5	0	0	827,618	1	827,619
			99	13	933,664	5	0	0	933,669	0	933,669
			00	12	917,858	5	0	0	917,863	0	917,863
			01	15	959,088	5	0	0	959,093	0	959,093
34077-87-7		Dichlorotri-fluoroethane	98	2	1,704	0	0	0	1,704	2	1,706
			99	1	12	0	0	0	12	2	14
			00	No reports							
			01	1	8	0	0	0	8	0	8
90454-18-5		Dichloro-1,1,2-trifluoroethane	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
812-04-4		1,1-Dichloro-1,2,2-trifluoro-ethane (HCFC-123b)	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
354-23-4		1,2-Dichloro-1,1,2-trifluoroethane (HCFC-123a)	98	1	101,118	5	0	0	101,123	0	101,123
			99	1	107,479	5	0	0	107,484	0	107,484
			00	1	108,513	5	0	0	108,518	0	108,518
			01	2	20,251	5	0	0	20,256	0	20,256
306-83-2		2,2-Dichloro-1,1,1-trifluoroethane (HCFC-123)	98	17	212,773	10	0	0	212,783	226	213,009
			99	13	105,447	5	0	0	105,452	0	105,452
			00	12	130,968	755	0	0	131,723	0	131,723
			01	15	121,787	5	0	0	121,792	500	122,292
62-73-7	*,**	Dichlorvos	98	5	255	5	0	0	260	9	269
			99	6	258	6	0	0	264	5	269
			00	6	260	5	0	0	265	0	265
			01	6	267	5	0	0	272	505	777
51338-27-3	*	Diclofop methyl	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
115-32-2	*	Dicofol	98	4	1,000	0	0	0	1,000	0	1,000
			99	6	1,011	0	0	0	1,011	0	1,011
			00	6	1,000	0	0	0	1,000	0	1,000
			01	4	2	0	0	0	2	0	2
77-73-6		Dicyclopentadiene	98	89	350,077	14,943	1,081,201	597	1,446,818	6,162	1,452,980
			99	97	351,816	11,818	973,928	10	1,337,572	3,162	1,340,734
			00	98	284,737	12,706	813,332	29	1,110,804	1,494	1,112,298
			01	93	264,264	3,845	268,140	80	536,329	14,161	550,490
1464-53-5	**	Diepoxybutane	98	1	70	0	0	0	70	0	70
			99	1	0	0	0	0	0	0	0
			00	1	0	0	0	0	0	0	0
			01	1	0	0	0	0	0	0	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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
*,** 1,3-Dichloro-propylene	98	1,932,000	0	6,000,000	30,754	1,173,568	42,814	11,227	9,190,363	0
	99	870,000	0	0	26,166	1,186,670	120,890	9,340	2,213,066	0
	00	2,943,000	0	24,000,000	191,953	8,294,051	23,199	9,901	35,462,104	0
	01	862,027	0	21,856,645	25,792	608,868	157,564	13,198	23,524,094	6
* Dichlorotetra-fluoroethane (CFC-114)	98	231,484	17,299	0	0	1,022,895	39,052	827,470	2,138,200	0
	99	195,012	13,065	0	0	38,821	134,587	918,711	1,300,196	18,960
	00	148,891	7,996	0	0	69,931	110,162	918,010	1,254,990	0
	01	74,600	25,899	0	0	1,606,924	195,397	959,944	2,862,764	614
Dichlorotri-fluoroethane	98	0	0	0	0	64,974	0	1,706	66,680	0
	99	0	0	0	0	47,879	0	14	47,893	0
	00	No reports								
	01	0	0	0	0	27,211	1	8	27,220	0
Dichloro-1,1,2-trifluoroethane	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
1,1-Dichloro-1,2,2-trifluoro-ethane (HCFC-123b)	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
1,2-Dichloro-1,1,2-trifluoroethane (HCFC-123a)	98	0	0	0	0	0	0	101,123	101,123	0
	99	0	0	0	0	0	0	107,484	107,484	0
	00	0	0	0	0	0	0	108,518	108,518	0
	01	0	0	0	0	72,570	4,095	20,256	96,921	18
2,2-Dichloro-1,1,1-trifluoroethane (HCFC-123)	98	0	0	0	0	74,202	6,066	211,401	291,669	955
	99	0	0	0	0	32,559	15,178	105,097	152,834	0
	00	0	0	0	0	4,330	10,996	130,068	145,394	1,500
	01	0	0	0	0	753,743	26,855	121,314	901,912	3,002
*,** Dichlorvos	98	0	0	0	0	14,968	1,130	517	16,615	0
	99	0	97	0	0	26,909	1,984	265	29,255	0
	00	0	3	0	328	12,924	2,432	261	15,948	0
	01	0	0	0	0	55,432	2,233	713	58,378	0
* Diclofop methyl	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
* Dicofol	98	0	0	0	0	0	895	229	1,124	0
	99	148	0	0	0	28,375	1,166	134	29,823	0
	00	0	0	0	0	25,898	1,355	113	27,366	0
	01	0	0	0	0	29,592	0	2	29,594	0
Dicyclopentadiene	98	457,481	54,182	1,055,862	790,262	558,315	226,565	1,482,794	4,625,461	7,570
	99	341,739	31,448	4,454,966	1,018,604	1,173,363	93,130	1,345,708	8,458,958	3,506
	00	502,962	270,004	3,656,320	632,259	1,405,954	178,807	1,115,106	7,761,412	1,446
	01	384,578	330,001	2,523,516	503,883	1,759,561	179,675	560,281	6,241,495	260
** Diepoxybutane	98	0	0	0	148,733	0	0	70	148,803	0
	99	0	0	0	0	11,634	0	0	11,634	0
	00	0	0	0	0	14,419	772	0	15,191	0
	01	0	0	330	774	13,335	44	0	14,483	0

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	On-site Releases: Surface Water Discharges Pounds	On-site Releases: Underground Injection Pounds	On-site Releases: Releases to Land Pounds	On-site Releases: Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
111-42-2		Diethanolamine	98	431	437,785	63,158	340,517	282,685	1,124,145	212,154	1,336,299
			99	417	376,144	35,086	354,606	144,789	910,625	237,278	1,147,903
			00	406	291,055	150,275	258,865	131,886	832,081	453,253	1,285,334
			01	391	240,287	47,535	120,689	30,556	439,067	380,580	819,647
38727-55-8	*	Diethatyl ethyl	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
117-81-7	*,**	Di(2-ethylhexyl) phthalate	98	367	220,906	669	0	24,184	245,759	1,208,283	1,454,042
			99	363	232,377	2,880	0	32,334	267,591	1,037,996	1,305,587
			00	366	243,299	597	250	6,188	250,334	1,150,136	1,400,470
			01	331	316,496	765	0	33,074	350,335	1,003,457	1,353,792
64-67-5	**	Diethyl sulfate	98	35	6,188	0	0	0	6,188	177	6,365
			99	31	3,737	0	0	0	3,737	34,518	38,255
			00	33	7,873	0	0	0	7,873	621	8,494
			01	34	17,048	0	0	0	17,048	666	17,714
35367-38-5	*	Diflubenzuron	98	2	0	0	0	0	0	0	0
			99	2	0	0	0	0	0	0	0
			00	2	0	0	0	0	0	0	0
			01	2	0	0	0	0	0	0	0
101-90-6	**	Diglycidyl resorcinol ether	98	3	20	0	0	0	20	0	20
			99	3	20	0	0	0	20	0	20
			00	4	10	0	0	0	10	0	10
			01	5	15	0	0	0	15	1,070	1,085
94-58-6	**	Dihydrosafrole	98	5	12,018	0	0	0	12,018	0	12,018
			99	6	273	0	0	0	273	167	440
			00	6	260	0	0	0	260	10	270
			01	5	256	0	0	0	256	260	516
--		Diisocyanates	98	1,423	448,990	28	0	1,058,920	1,507,938	1,068,921	2,576,859
			99	1,444	281,045	22	0	712,916	993,983	1,048,442	2,042,425
			00	1,445	301,688	16	0	869,101	1,170,805	1,916,389	3,087,194
			01	1,415	328,796	8	0	981,733	1,310,537	1,531,254	2,841,791
55290-64-7	*	Dimethipin	98	1	0	0	0	0	0	0	0
			99	1	0	0	0	0	0	0	0
			00	2	250	0	0	0	250	0	250
			01	3	250	0	0	0	250	0	250
60-51-5	*	Dimethoate	98	8	57	5	0	19,975	20,037	69	20,106
			99	9	51	5	0	0	56	177	233
			00	9	36	255	0	0	291	0	291
			01	9	27	5	0	0	32	620	652
119-90-4	**	3,3'-Dimethoxy-benzidine	98	1	0	0	0	0	0	0	0
			99	3	7	1	0	0	8	162	170
			00	3	0	0	0	0	0	5	5
			01	4	0	0	0	0	0	260	260
20325-40-0	**	3,3'-Dimethoxy-benzidine dihydrochloride	98	7	0	0	0	0	0	0	0
			99	8	12	220	0	0	232	0	232
			00	7	16	36	0	0	52	0	52
			01	5	8	33	0	0	41	0	41

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

			Recycled		Energy Recovery		Treated				
	Chemical	Year	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
	Diethanolamine	98	56,218	289,382	280,874	875,890	2,918,919	2,698,496	3,086,132	10,205,911	80
		99	0	72,622	779,443	429,493	2,746,915	1,470,236	1,521,426	7,020,135	55,474
		00	36,064	115,049	602,968	134,198	12,008,406	1,329,969	2,358,803	16,585,457	5,077
		01	765	79,021	560,007	118,083	2,141,298	3,181,449	591,010	6,671,633	488
*	Diethatyl ethyl	98	No reports								
		99	No reports								
		00	No reports								
		01	No reports								
*,**	Di(2-ethylhexyl) phthalate	98	5,157,020	1,897,252	464,843	1,682,746	409,433	310,550	1,212,233	11,134,077	561
		99	4,044,097	3,178,784	344,691	211,818	374,506	246,077	1,246,784	9,646,757	10,141
		00	3,965,259	3,276,932	481,682	242,701	4,400,961	193,157	1,427,492	13,988,184	1,458
		01	3,421,804	3,058,111	534,065	227,417	353,938	298,772	1,325,155	9,219,262	13,674
**	Diethyl sulfate	98	0	0	0	6,887,636	4,489	2,510	6,509	6,901,144	5
		99	0	0	0	7,660,910	3,705	459	42,668	7,707,742	0
		00	0	0	0	5,843,800	1,328	4,879	10,720	5,860,727	0
		01	0	0	0	6,608,218	4,921	2,886	32,097	6,648,122	0
*	Diflubenzuron	98	0	0	0	0	0	0	0	0	0
		99	0	0	0	0	0	0	0	0	0
		00	0	0	0	0	0	0	0	0	0
		01	0	0	0	0	0	0	0	0	0
**	Diglycidyl resorcinol ether	98	0	0	0	300	0	0	6	306	0
		99	0	0	0	1,100	0	0	6	1,106	0
		00	0	0	0	0	0	0	1	1	0
		01	0	0	0	0	0	0	964	964	0
**	Dihydrosafrole	98	0	0	0	0	0	10	12,028	12,038	0
		99	0	0	0	0	189,324	10	249	189,583	0
		00	0	0	0	0	152,308	795	90	153,193	0
		01	0	0	330	880	138,154	44	126	139,534	0
	Diisocyanates	98	1,352,830	450,903	573,125	1,960,329	3,167,493	1,563,510	2,189,075	11,257,265	9,892
		99	112,052	563,101	125,596	549,383	6,584,088	1,694,135	2,008,004	11,636,359	20,376
		00	145,962	360,717	195,025	877,887	2,845,078	1,677,538	3,012,369	9,114,576	7,302
		01	65,846	248,704	90,841	547,054	2,102,999	2,335,564	2,954,298	8,345,306	57,911
*	Dimethipin	98	0	0	0	0	0	0	0	0	0
		99	0	0	0	0	0	0	0	0	0
		00	0	0	0	0	0	2,596	229	2,825	0
		01	0	0	0	98	0	30,370	301	30,769	0
*	Dimethoate	98	433	0	0	0	63,138	4,105	28,041	95,717	0
		99	0	0	0	0	210,152	8,691	5,067	223,910	0
		00	0	0	0	10,000	173,804	14,795	5,246	203,845	0
		01	101	0	0	0	157,956	5,476	27	163,560	0
**	3,3'-Dimethoxy-benzidine	98	0	0	0	0	0	0	0	0	0
		99	0	0	0	0	178,511	0	164	178,675	0
		00	0	0	0	0	147,966	787	2	148,755	0
		01	0	0	330	931	153,705	50	16	155,032	0
**	3,3'-Dimethoxy-benzidine dihydrochloride	98	0	0	0	0	15	0	0	15	0
		99	0	0	0	0	1,115	0	232	1,347	0
		00	0	0	0	0	153	0	52	205	0
		01	0	0	0	0	120	0	41	161	0

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	On-site Releases: Surface Water Discharges Pounds	On-site Releases: Underground Injection Pounds	On-site Releases: Releases to Land Pounds	On-site Releases: Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
111984-09-9	**	3,3'-Dimethoxy-benzidine hydrochloride	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
124-40-3		Dimethylamine	98	81	446,977	35,629	26,250	3,788	512,644	127	512,771
			99	81	417,067	30,069	24,250	2,735	474,121	440	474,561
			00	86	390,113	22,005	16,200	3,440	431,758	3,581	435,339
			01	76	490,785	19,354	14,443	3,465	528,047	802	528,849
2300-66-5	*	Dimethylamine dicamba	98	3	250	0	0	0	250	0	250
			99	5	250	0	0	0	250	0	250
			00	8	255	0	250	0	505	0	505
			01	8	541	0	250	0	791	0	791
60-11-7	**	4-Dimethylamino-azobenzene	98	No reports							
			99	No reports							
			00	1	0	0	0	0	0	0	0
			01	2	250	0	0	0	250	505	755
121-69-7		N,N-Dimethyl-aniline	98	23	32,509	850	0	0	33,359	7,523	40,882
			99	25	27,808	349	0	0	28,157	2,744	30,901
			00	21	20,196	719	0	0	20,915	142	21,057
			01	20	5,235	50	0	0	5,285	1,892	7,177
119-93-7	**	3,3'-Dimethyl-benzidine	98	2	10	0	0	0	10	0	10
			99	4	17	1	0	0	18	171	189
			00	4	10	0	0	0	10	10	20
			01	4	5	0	0	0	5	265	270
612-82-8	**	3,3'-Dimethyl-benzidine dihydrochloride	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
41766-75-0	**	3,3'-Dimethyl-benzidine dihydrofluoride	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
79-44-7	**	Dimethylcarbamyl chloride	98	2	98	0	0	0	98	0	98
			99	4	99	1	0	0	100	173	273
			00	4	107	0	0	0	107	10	117
			01	4	106	0	0	0	106	260	366
2524-03-0		Dimethyl chloro-thiophosphate	98	3	77	0	4,300	0	4,377	0	4,377
			99	1	2	1	0	0	3	4	7
			00	No reports							
			01	No reports							
68-12-2	*	N,N-Dimethyl-formamide	98	217	989,949	43,057	284,182	14,976	1,332,164	663,383	1,995,547
			99	216	778,543	28,304	127,125	5	933,977	817,069	1,751,046
			00	220	731,231	20,506	109,984	1,000	862,721	1,730,089	2,592,810
			01	198	534,812	37,561	87,100	25,959	685,432	1,299,161	1,984,593
57-14-7	*,**	1,1-Dimethyl hydrazine	98	5	496	0	0	0	496	0	496
			99	7	433	1	0	0	434	564	998
			00	7	668	0	0	0	668	82	750
			01	7	703	0	0	0	703	760	1,463

Note: On-site Releases are from Section 5 of Form R **Off-site Releases** are from Section 6 (transfers off-site to disposal) of Form R **Off-site Releases** include metals and metal 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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Sub itle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
** 3,3'-Dimethoxy-benzidine hydrochloride	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
Dimethylamine	98	574,603	0	28,500	151,423	3,970,912	450,473	512,176	5,688,087	65
	99	716,804	0	8,510	6,127	3,318,106	538,310	477,734	5,065,591	77
	00	413,215	294	11,989	3,833	4,892,687	824,088	434,599	6,580,705	0
	01	460,554	440	14,967	10,190	8,895,728	741,127	522,625	10,645,631	430
* Dimethylamine dicamba	98	0	0	0	0	0	0	88	88	0
	99	0	0	0	0	0	0	32	32	0
	00	0	0	0	0	0	0	500	500	0
	01	0	0	0	0	20	612	618	1,250	0
** 4-Dimethylamino-azobenzene	98	No reports								
	99	No reports								
	00	0	0	0	0	13,740	781	0	14,521	0
	01	0	0	330	372	72,847	26	443	74,018	0
N,N-Dimethyl-aniline	98	46,000	21,000	0	826,721	19,620	166,523	31,305	1,111,169	0
	99	52,678	19,000	33,536	719,800	172,741	167,708	28,184	1,193,647	2
	00	43,000	0	0	62,296	130,099	47,334	21,144	303,873	0
	01	3,000	4,350	13,501	54,604	99,117	114,152	5,380	294,104	1,111
** 3,3'-Dimethyl-benzidine	98	0	0	0	505	48,005	0	5	48,515	0
	99	0	0	0	0	207,475	146	173	207,794	0
	00	0	0	0	1,288	194,983	3	6	196,280	0
	01	0	0	330	372	186,320	17	28	187,067	0
** 3,3'-Dimethyl-benzidine dihydrochloride	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
** 3,3'-Dimethyl-benzidine dihydrofluoride	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
** Dimethylcarbamyl chloride	98	0	0	0	0	27,113	0	98	27,211	0
	99	0	0	0	0	247,799	0	271	248,070	0
	00	0	0	0	0	191,621	791	115	192,527	0
	01	0	0	330	216	173,817	24	183	174,570	0
Dimethyl chloro-thiophosphate	98	0	0	0	0	1,960	0	4,331	6,291	0
	99	0	0	0	0	16,000	0	1	16,001	0
	00	No reports								
	01	No reports								
* N,N-Dimethyl-formamide	98	9,779,243	260,230	9,774,280	8,314,426	14,014,846	5,261,240	1,610,944	49,015,209	1,449
	99	9,264,611	191,429	11,042,710	12,844,462	12,930,112	8,650,924	1,753,048	56,677,296	2,086
	00	14,406,865	227,944	14,130,891	17,481,416	14,375,427	12,016,979	2,301,346	74,940,868	196
	01	6,901,102	176,169	12,029,467	17,683,609	11,576,724	13,495,356	1,453,983	63,316,410	320
*,** 1,1-Dimethyl hydrazine	98	0	0	0	300	1,218	3,913	493	5,924	0
	99	0	0	0	320	549,769	7,687	990	558,766	0
	00	0	0	0	0	395,623	2,380	597	398,600	0
	01	0	0	330	2,075	278,516	565	735	282,221	0

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
105-67-9	*	2,4-Dimethyl-phenol	98	28	36,025	56	187,076	0	223,157	1,177	224,334
			99	31	32,439	123	156,592	0	189,154	2,216	191,370
			00	35	32,066	1,314	201,020	0	234,400	1,543	235,943
			01	29	26,861	1,134	158,026	0	186,021	4,976	190,997
131-11-3	*	Dimethyl phthalate	98	126	264,050	627	2,950	827	268,454	39,088	307,542
			99	117	417,241	806	1,900	15,014	434,961	38,868	473,829
			00	128	290,275	852	1,905	33,085	326,117	35,180	361,297
			01	117	235,879	98	2,200	36,413	274,590	42,364	316,954
77-78-1	**	Dimethyl sulfate	98	36	10,831	46	0	0	10,877	1,010	11,887
			99	34	9,873	4	0	0	9,877	187	10,064
			00	37	7,501	22	0	40	7,563	255	7,818
			01	32	6,805	1	0	0	6,806	506	7,312
99-65-0		m-Dinitrobenzene	98	2	383	517	0	516	1,416	0	1,416
			99	4	385	442	0	49	876	100	976
			00	2	355	466	0	134	955	0	955
			01	3	316	412	0	0	728	0	728
528-29-0		o-Dinitrobenzene	98	2	49	66	0	66	181	0	181
			99	2	49	63	0	0	112	0	112
			00	1	45	60	0	0	105	0	105
			01	1	40	53	0	0	93	0	93
100-25-4		p-Dinitrobenzene	98	1	13	18	0	18	49	0	49
			99	1	14	17	0	0	31	0	31
			00	1	12	81	0	0	93	0	93
			01	1	11	72	0	0	83	0	83
88-85-7	*	Dinitrobutyl phenol	98	7	1,057	0	0	0	1,057	6,888	7,945
			99	6	1,005	0	0	50	1,055	16,848	17,903
			00	8	1,208	0	0	0	1,208	8,850	10,058
			01	9	883	0	0	0	883	0	883
534-52-1	*	4,6-Dinitro-o-cresol	98	8	234	0	0	10,801	11,035	125,332	136,367
			99	10	259	0	0	43,655	43,914	160,665	204,579
			00	11	434	5	250	14,499	15,188	115,106	130,294
			01	11	1,416	5	5	56,960	58,386	39,705	98,091
51-28-5	*	2,4-Dinitrophenol	98	8	524	23,617	0	11,000	35,141	1,632	36,773
			99	9	197	23,287	0	46,938	70,422	26,063	96,485
			00	9	728	23,292	250	31,156	55,426	1,325	56,751
			01	9	1,569	500	250	65,603	67,922	31,900	99,822
121-14-2	**	2,4-Dinitrotoluene	98	13	1,995	187	0	10,000	12,182	1,408	13,590
			99	15	2,287	169	0	43,420	45,876	49,295	95,171
			00	16	1,931	177	250	27,609	29,967	19,601	49,568
			01	17	2,190	10	5	665,529	667,734	28,132	695,866
606-20-2	**	2,6-Dinitrotoluene	98	3	472	62	0	0	534	0	534
			99	7	660	43	0	15,287	15,990	16,909	32,899
			00	8	513	32	250	0	795	2,030	2,825
			01	7	740	0	0	1,298,442	1,299,182	5,355	1,304,537
25321-14-6		Dinitrotoluene (mixed isomers)	98	11	13,439	1	36,005	0	49,445	1,403	50,848
			99	16	9,657	1	1,100	0	10,758	322	11,080
			00	19	10,423	4	3,300	696	14,423	22,098	36,521
			01	22	10,089	8	3,000	15	13,112	696	13,808

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR: not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

	Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
*	2,4-Dimethyl-phenol	98	6,240	93,314	1,491,389	42,851	549,119	29,711	224,075	2,436,699	193
		99	19,796	65,907	2,268,009	20,395	743,427	23,241	189,661	3,330,436	183
		00	8,208	74,248	1,955,017	17,349	931,927	29,790	238,363	3,254,902	29
		01	7,386	20,595	1,543,558	13,670	648,288	24,698	188,700	2,446,895	153
*	Dimethyl phthalate	98	1,300	11	401,458	241,859	1,131,708	25,487	322,611	2,124,434	264
		99	22,721	274	1,514,650	190,265	1,711,112	20,888	373,021	3,832,931	0
		00	22,397	634	952,968	119,513	1,447,434	93,408	377,952	3,014,306	0
		01	24,130	31,798	2,590,752	133,021	1,459,425	155,678	317,501	4,712,305	201
**	Dimethyl sulfate	98	0	260,865	32,693	0	221,659	861	10,613	526,691	0
		99	0	131,338	0	0	330,640	9,400	9,952	481,330	0
		00	0	62,518	0	0	427,552	212,794	7,342	710,206	40
		01	0	200,628	466	106,891	413,326	103	6,972	728,386	0
	m-Dinitrobenzene	98	0	0	0	0	516,692	0	1,416	518,108	0
		99	0	0	0	0	614,959	0	975	615,934	0
		00	0	0	0	0	465,539	473	955	466,967	0
		01	0	0	0	0	459,887	280	728	460,895	0
	o-Dinitrobenzene	98	0	0	0	0	66,089	0	181	66,270	0
		99	0	0	0	0	62,743	0	112	62,855	0
		00	0	0	0	0	59,324	61	105	59,490	0
		01	0	13,902	0	0	52,672	36	93	66,703	0
	p-Dinitrobenzene	98	0	0	0	0	18,024	0	49	18,073	0
		99	0	0	0	0	17,112	0	31	17,143	0
		00	0	0	0	0	16,179	17	93	16,289	0
		01	0	3,791	0	0	14,307	10	83	18,191	0
*	Dinitrobutyl phenol	98	0	0	310,000	0	59,853	0	7,942	377,795	0
		99	0	0	323,000	0	69,847	1,000	17,898	411,745	0
		00	0	0	309,000	0	99,544	84	10,204	418,832	0
		01	0	0	368,524	25,641	80,924	193	883	476,165	0
*	4,6-Dinitro-o-cresol	98	0	0	1,466,262	10,696	31,360	6,075	134,791	1,649,184	0
		99	0	0	1,664,037	165,913	97,669	19,081	192,128	2,138,828	0
		00	0	0	1,757,338	58,751	75,256	64,353	130,185	2,085,883	0
		01	0	3,185	966,833	15,173	45,080	28,937	98,091	1,157,299	0
*	2,4-Dinitrophenol	98	0	0	562,709	29,118	2,017,113	53	36,991	2,645,984	0
		99	0	0	301,737	317,192	1,883,063	72	96,481	2,598,545	0
		00	0	0	290,282	58,571	1,168,874	183,793	56,653	1,758,173	0
		01	0	3,184	496,746	15,186	1,941,803	96,432	105,875	2,659,226	0
**	2,4-Dinitrotoluene	98	0	0	41,135	9,706	160,606	1,785	14,090	227,322	0
		99	0	0	32,234	952	1,071,719	21,382	90,182	1,216,469	0
		00	0	0	34,248	58	3,240,864	1,630	54,482	3,331,282	0
		01	0	3,557	26,483	7,706	1,541,485	25,252	925,284	2,529,767	0
**	2,6-Dinitrotoluene	98	0	0	0	0	48,264	155	530	48,949	0
		99	0	0	3,451	0	127,681	5,200	24,417	160,749	0
		00	0	0	44,072	76	375,816	914	7,900	428,778	0
		01	0	0	27,327	1,452	121,702	594	1,325,328	1,476,403	0
	Dinitrotoluene (mixed isomers)	98	0	202,569	0	12	201,181	587,330	50,179	1,041,271	8,700
		99	0	0	0	0	858,109	806,158	11,489	1,675,756	3,200
		00	0	0	0	0	1,048,383	1,515,526	35,961	2,599,870	696
		01	0	0	0	359,727	874,506	1,481,756	13,790	2,729,779	60

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	On-site Releases: Surface Water Discharges Pounds	On-site Releases: Underground Injection Pounds	On-site Releases: Releases to Land Pounds	On-site Releases: Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
39300-45-3	*	Dinocap	98	1	255	0	0	0	255	0	255
			99	No reports							
			00	No reports							
			01	1	0	0	0	0	0	0	0
123-91-1	**	1,4-Dioxane	98	54	112,597	144,534	250	14,405	271,786	478,141	749,927
			99	64	164,883	168,128	250	52,972	386,233	666,121	1,052,354
			00	63	107,519	163,776	0	18,131	289,426	357,652	647,078
			01	55	112,584	81,278	0	63,135	256,997	678,752	935,749
--	**, ***	Dioxin and dioxin-like compounds	98	NR	NR	NR	NR	NR	NR	NR	NR
			99	NR	NR	NR	NR	NR	NR	NR	NR
			00	1,309	8.35	4.55	0.89	84.31	98.10	120.29	218.39
--		*In grams*	*00*	*1,309*	*3,789.081*	*2,061.866*	*405.192*	*38,235.732*	*44,491.872*	*54,552.867*	*99,044.739*
			01	1,320	6.37	4.08	0.33	116.36	127.14	200.88	328.01
--		*In grams*	*01*	*1,320*	*2,887.566*	*1,850.869*	*148.151*	*52,771.401*	*57,657 988*	*91,100 805*	*148,758 793*
957-51-7	*	Diphenamid	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
122-39-4	*	Diphenylamine	98	30	61,978	25	9,665	250	71,918	43,599	115,517
			99	37	51,072	32	5,772	10,380	67,256	48,975	116,231
			00	32	28,280	33	7,986	13,250	49,549	28,285	77,834
			01	35	60,084	29	6,890	32,678	99,681	44,074	143,755
122-66-7	**	1,2-Diphenylhydrazine	98	2	5	0	0	0	5	0	5
			99	2	7	1	0	0	8	4	12
			00	3	0	0	0	0	0	5	5
			01	2	0	5	0	0	5	260	265
2164-07-0	*	Dipotassium endothall	98	2	20	0	0	0	20	0	20
			99	1	10	0	0	0	10	0	10
			00	2	20	0	0	0	20	0	20
			01	1	10	0	0	0	10	0	10
136-45-8	*	Dipropyl isocinchomeronate	98	1	0	0	0	0	0	0	0
			99	2	0	0	0	0	0	0	0
			00	1	0	0	0	0	0	0	0
			01	1	250	0	0	0	250	0	250
138-93-2	*	Disodium cyanodithioimidocarbonate	98	5	0	0	0	0	0	0	0
			99	2	0	0	0	0	0	0	0
			00	4	0	0	0	0	0	0	0
			01	4	0	0	0	0	0	0	0
94-11-1	*,**	2,4-D isopropyl ester	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
541-53-7	*	2,4-Dithiobiuret	98	No reports							
			99	2	11	0	0	0	11	333	344
			00	1	0	0	0	0	0	0	0
			01	1	0	0	0	0	0	0	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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information) For dioxin and dioxin-like compounds, applies only to 2,3,7,8-Tetrachlorodibenzo-p-dioxin

*** PBT Chemicals added to list for 2000 reporting year See Chapter 3 for more information

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
* Dinocap	98	0	0	0	0	0	109	8	117	0
	99	No reports								
	00	No reports								
	01	0	0	0	0	0	0	0	0	0
** 1,4-Dioxane	98	1,120,000	4,101	595,806	1,126,560	1,827,490	422,076	747,531	5,843,564	18
	99	1,549,078	13,401	1,811,182	1,511,434	2,368,009	373,265	1,058,427	8,684,796	11
	00	1,842,597	7,601	3,487,906	1,702,760	2,051,505	387,669	645,836	10,125,874	4
	01	960,000	3,384	902,375	1,083,729	1,896,403	254,520	934,958	6,035,369	195
**, Dioxin and	98	NR	NR	NR	NR	NR	NR	NR	NR	NR
*** dioxin-like	99	NR	NR	NR	NR	NR	NR	NR	NR	NR
compounds	00	9.81	0.05	0.05	4.40	550.24	70.88	217.73	853.16	59.14
In grams	*00*	*4,448.624*	*21.942*	*21.426*	*1,994.612*	*249,543.109*	*32,144.789*	*98,745.115*	*386,919.617*	*26,821.006*
	01	3.27	0.23	0.03	6.09	516.62	118.13	340.50	984.86	29.13
In grams	*01*	*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*
* Diphenamid	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
* Diphenylamine	98	199,400	35,131	4,769,102	823,607	246,295	77,905	86,356	6,237,796	5,700
	99	155,450	879	5,216,863	800,381	397,903	84,462	96,751	6,752,689	1
	00	9,000	595	4,852,949	1,021,087	234,208	81,606	71,588	6,271,033	0
	01	10,000	1,752	3,543,989	1,028,741	220,164	186,384	88,788	5,079,818	0
** 1,2-Diphenyl-	98	0	0	0	0	5,485	55	1	5,541	0
hydrazine	99	0	0	0	0	37,267	53	2	37,322	0
	00	0	0	0	0	45,137	871	2	46,010	0
	01	0	0	330	1,491	72,797	140	18	74,776	0
* Dipotassium	98	0	0	0	0	1,900	5,400	201	7,501	0
endothall	99	0	0	0	0	0	3,400	400	3,800	0
	00	0	0	0	0	0	103,424	200	103,624	0
	01	0	0	0	0	0	58,045	0	58,045	0
* Dipropyl isocin-	98	0	0	0	0	0	0	0	0	0
chomeronate	99	0	0	0	0	0	0	0	0	0
	00	0	0	0	0	0	0	0	0	0
	01	0	0	0	0	0	25	26	51	26
* Disodium cyano-	98	0	0	0	0	0	0	0	0	0
dithioimido-	99	0	0	0	0	0	0	0	0	0
carbonate	00	0	0	0	0	0	0	0	0	0
	01	0	0	0	0	0	0	0	0	0
*,**2,4-D isopropyl	98	No reports								
ester	99	No reports								
	00	No reports								
	01	No reports								
* 2,4-Dithiobiuret	98	No reports								
	99	0	0	0	0	122,493	0	342	122,835	0
	00	0	0	0	0	55,816	0	0	55,816	0
	01	0	0	0	0	55,816	0	0	55,816	0

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information) For dioxin and dioxin-like compounds, applies only to 2,3,7,8-Tetrachlorodibenzo-p-dioxin

*** PBT Chemcicals added to list for 2000 reporting year See Chapter 3 for more information

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	On-site Releases: Surface Water Discharges Pounds	On-site Releases: Underground Injection Pounds	On-site Releases: Releases to Land Pounds	On-site Releases: Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
330-54-1	*	Diuron	98	12	3,323	260	0	35,756	39,339	14,100	53,439
			99	9	4,919	260	0	0	5,179	2	5,181
			00	10	4,506	255	0	0	4,761	0	4,761
			01	14	1,574	258	0	13,550	15,382	30	15,412
2439-10-3	*	Dodine	98	1	0	0	0	0	0	0	0
			99	1	0	0	0	0	0	0	0
			00	1	0	0	0	0	0	0	0
			01	No reports							
120-36-5	*,**	2,4-DP	98	3	0	0	0	0	0	0	0
			99	6	70	0	0	0	70	54	124
			00	3	0	0	0	0	0	0	0
			01	3	0	0	0	0	0	0	0
1320-18-9	*,**	2,4-D propylene glycol butyl ether ester	98	No reports							
			99	No reports							
			00	1	0	0	0	0	0	0	0
			01	No reports							
2702-72-9	*,**	2,4-D sodium salt	98	1	0	0	0	0	0	0	0
			99	1	0	30	0	0	30	0	30
			00	1	0	0	0	0	0	0	0
			01	2	0	0	0	0	0	0	0
106-89-8	*,**	Epichlorohydrin	98	83	199,100	434	12,162	2,167	213,863	16,603	230,466
			99	82	147,771	306	0	1,745	149,822	2,892	152,714
			00	78	202,645	389	0	3,950	206,984	11,113	218,097
			01	79	208,058	7,619	13,998	4,576	234,251	2,794	237,045
13194-48-4	*	Ethoprop	98	7	34	0	0	116,444	116,478	6	116,484
			99	8	1	0	0	121,886	121,887	27	121,914
			00	7	46	0	0	104,984	105,030	0	105,030
			01	4	7	0	0	77,376	77,383	500	77,883
110-80-5		2-Ethoxyethanol	98	40	138,314	1	0	0	138,315	2,989	141,304
			99	46	151,979	378	0	17	152,374	84,634	237,008
			00	39	120,583	385	0	10,470	131,438	2,020	133,458
			01	35	103,469	44	0	552	104,065	3,377	107,442
140-88-5	**	Ethyl acrylate	98	110	127,134	110	0	524	127,768	12,283	140,051
			99	109	131,120	112	810	15,165	147,207	29,652	176,859
			00	110	111,403	100	403	12,765	124,671	9,906	134,577
			01	107	104,482	86	0	18	104,586	80,291	184,877
100-41-4	**	Ethylbenzene	98	1,662	8,707,538	9,940	762,893	214,921	9,695,292	168,457	9,863,749
			99	1,652	8,821,358	9,243	880,299	39,867	9,750,767	340,680	10,091,447
			00	1,657	8,370,176	15,421	563,006	49,691	8,998,294	129,611	9,127,905
			01	1,627	6,547,375	8,713	652,222	18,428	7,226,738	377,304	7,604,042
541-41-3		Ethyl chloro-formate	98	5	2,259	5	0	5	2,269	0	2,269
			99	4	2,200	5	0	5	2,210	0	2,210
			00	5	1,846	5	0	5	1,856	0	1,856
			01	5	5,513	5	0	5	5,523	0	5,523
759-94-4	*	Ethyl dipropyl-thiocarbamate	98	6	2,008	115	2,088	0	4,211	4,565	8,776
			99	4	2,574	156	903	0	3,633	3,570	7,203
			00	4	2,034	95	6,083	0	8,212	2,798	11,010
			01	3	2,034	99	1,146	0	3,279	1,655	4,934

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
* Diuron	98	250	0	0	0	0	20,767	43,048	64,065	125
	99	250	0	0	0	18,317	4,336	26,198	49,101	5
	00	250	0	0	0	20,836	46	4,294	25,426	0
	01	250	0	0	0	43,725	14,562	16,075	74,612	0
* Dodine	98	0	0	0	0	0	0	0	0	0
	99	0	0	0	0	0	0	0	0	0
	00	0	0	0	0	0	0	0	0	0
	01	No reports								
*,**2,4-DP	98	0	0	0	0	0	0	0	0	0
	99	0	0	0	0	9,954	0	124	10,078	0
	00	0	0	0	0	0	0	0	0	0
	01	0	0	0	0	0	0	0	0	0
*,**2,4-D propylene glycol butyl ether ester	98	No reports								
	99	No reports								
	00	0	0	0	0	0	0	0	0	0
	01	No reports								
*,**2,4-D sodium salt	98	0	0	0	0	4,600	0	0	4,600	0
	99	0	0	0	0	20,000	0	30	20,030	0
	00	0	0	0	0	17,700	0	0	17,700	0
	01	0	0	0	0	14,300	0	0	14,300	0
*,**Epichlorohydrin	98	10,499,178	17,715	4,859,842	85,210	25,251,899	953,525	225,006	41,892,375	0
	99	11,169,456	0	4,121,093	103,015	33,496,844	489,349	153,387	49,533,144	0
	00	9,730,583	29	4,588,509	120,177	271,275,698	314,667	674,955	286,704,618	383
	01	10,579,033	0	10,614,320	342,211	11,886,065	1,773,333	208,289	35,403,251	88
* Ethoprop	98	95	0	0	0	12,176	4,943	116,484	133,698	0
	99	69	0	0	0	50,057	20,347	137,068	207,541	0
	00	0	0	0	0	27,193	3,344	105,026	135,563	0
	01	0	0	0	0	12,394	1,428	77,442	91,264	0
2-Ethoxyethanol	98	1,400	26,052	584,971	3,033,018	585,072	863,044	162,849	5,256,406	10,515
	99	1,246,836	87,571	12,992,481	2,048,621	2,050,700	2,435,150	164,459	21,025,818	10
	00	1,200	0	2,643,347	364,738	1,379,052	262,667	151,540	4,802,544	0
	01	1,360	0	3,430,755	270,389	1,598,737	151,463	118,082	5,570,786	0
** Ethyl acrylate	98	381,888	9,460	8,430,381	2,405,597	1,431,129	353,984	142,046	13,154,485	4,152
	99	606,528	260	10,064,209	1,726,887	1,341,616	402,531	185,424	14,327,455	2,509
	00	979,107	70	7,531,839	1,387,308	1,578,535	602,567	144,117	12,223,543	1,749
	01	1,566,902	4	5,780,792	1,355,087	1,942,156	725,129	121,596	11,491,666	3,905
** Ethylbenzene	98	31,224,164	6,745,120	36,817,834	28,919,758	18,745,512	3,698,313	10,200,294	136,350,995	155,099
	99	27,938,254	5,706,882	33,496,251	14,641,980	20,349,586	2,678,784	10,105,316	114,917,053	59,225
	00	23,019,140	5,299,883	31,192,474	15,048,235	22,417,686	2,376,888	9,396,018	108,750,324	16,520
	01	20,506,557	5,337,683	28,559,219	15,990,844	22,884,406	2,323,161	7,989,286	103,591,156	92,082
Ethyl chloro-formate	98	0	0	0	0	53,660	0	2,035	55,695	0
	99	0	0	0	0	21,445	0	1,998	23,443	0
	00	0	42	0	0	52,398	160	1,875	54,475	0
	01	0	0	0	123	169,913	92,050	5,436	267,522	0
* Ethyl dipropyl-thiocarbamate	98	0	0	0	0	82,335	33,089	8,528	123,952	524
	99	0	0	0	0	859	14,694	7,119	22,672	1,508
	00	0	0	0	0	819	61,045	10,163	72,027	9,222
	01	0	0	0	0	505	6,438	4,308	11,251	6

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	On-site Releases: Surface Water Discharges Pounds	On-site Releases: Underground Injection Pounds	On-site Releases: Releases to Land Pounds	On-site Releases: Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
74-85-1	*	Ethylene	98	325	31,172,324	3,059	4,217	83	31,179,683	1,815	31,181,498
			99	317	25,833,707	918	65,158	71,624	25,971,407	361	25,971,768
			00	314	22,593,385	889	31,447	0	22,625,721	395	22,626,116
			01	309	23,918,535	1,394	6,682	4	23,926,615	116	23,926,731
--		Ethylenebisdithio-carbamic acid, salts and esters	98	5	164	0	0	0	164	513	677
			99	6	261	0	0	0	261	159	420
			00	8	400	0	0	0	400	25	425
			01	10	3,583	0	0	0	3,583	760	4,343
107-21-1	*	Ethylene glycol	98	1,674	6,130,990	808,243	542,188	1,001,840	8,483,261	1,898,263	10,381,524
			99	1,648	5,567,538	530,817	1,224,809	1,109,108	8,432,272	2,527,693	10,959,965
			00	1,645	4,661,035	719,726	581,939	1,126,540	7,089,240	6,256,233	13,345,473
			01	1,546	4,870,364	656,701	152,765	1,889,968	7,569,798	1,925,668	9,495,465
151-56-4	**	Ethyleneimine	98	2	34	0	0	0	34	0	34
			99	3	10	0	0	0	10	153	163
			00	2	3	0	0	0	3	0	3
			01	2	8	0	0	0	8	0	8
75-21-8	*,**	Ethylene oxide	98	156	690,691	372	22,561	1,751	715,375	1,860	717,235
			99	150	495,134	1,158	10,796	1,750	508,838	60,924	569,762
			00	156	466,452	6,912	226	401	473,991	56,820	530,811
			01	150	494,158	4,692	0	16	498,866	17,495	516,361
96-45-7	*,**	Ethylene thiourea	98	16	299	5	0	0	304	6,387	6,691
			99	17	293	5	0	0	298	6,195	6,493
			00	16	275	10	0	0	285	2,024	2,309
			01	13	21	5	0	0	26	2,262	2,288
75-34-3		Ethylidene dichloride	98	13	44,468	0	0	0	44,468	8	44,476
			99	11	82,398	1	0	3	82,402	9	82,411
			00	16	15,209	0	0	0	15,209	17	15,226
			01	13	17,530	26	0	0	17,556	1,011	18,567
52-85-7	*	Famphur	98	3	5	0	0	0	5	9,200	9,205
			99	3	5	0	0	0	5	5,612	5,617
			00	2	5	0	0	0	5	0	5
			01	1	0	0	0	0	0	0	0
60168-88-9	*	Fenarimol	98	2	0	0	0	0	0	0	0
			99	2	0	0	0	0	0	0	0
			00	1	0	0	0	0	0	0	0
			01	1	0	0	0	0	0	0	0
13356-08-6	*	Fenbutatin oxide	98	2	664	0	660	0	1,324	0	1,324
			99	2	664	0	660	0	1,324	0	1,324
			00	2	664	0	1,260	0	1,924	0	1,924
			01	2	664	0	780	0	1,444	0	1,444
66441-23-4	*	Fenoxaprop ethyl	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
72490-01-8	*	Fenoxycarb	98	1	0	0	0	0	0	1	1
			99	1	0	0	0	0	0	0	0
			00	1	0	0	0	0	0	0	0
			01	1	0	0	0	0	0	0	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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
* Ethylene	98	123,826,795	0	487,307,269	12,978,078	509,690,125	3,013,379	29,462,891	1,166,278,537	1,428,754
	99	146,725,271	317	360,906,102	11,136,191	568,875,269	4,761,444	26,924,609	1,119,329,203	393,952
	00	203,136,424	318	525,713,123	17,008,011	670,878,430	1,751,486	22,017,312	1,440,505,104	313,655
	01	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
Ethylenebisdithio-carbamic acid, salts and esters	98	0	0	0	0	0	3,329	672	4,001	0
	99	0	0	0	0	129,960	8,070	520	138,550	0
	00	0	0	1,057	2,290	160,622	18,092	196	182,257	0
	01	0	0	14,179	3,075	177,584	6,948	3,920	205,706	0
* Ethylene glycol	98	471,754,870	59,901,293	6,695,918	22,125,054	66,506,276	31,968,406	10,793,957	669,745,774	832,225
	99	477,382,074	71,806,367	8,427,689	16,466,419	52,374,629	29,543,071	11,768,372	667,768,621	932,352
	00	426,666,641	74,259,381	5,403,146	16,176,417	79,196,008	30,406,974	11,969,575	644,078,142	177,963
	01	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
** Ethyleneimine	98	0	0	0	31,069	24,000	0	34	55,103	0
	99	0	0	0	0	130,040	0	163	130,203	0
	00	0	0	0	0	74,812	0	3	74,815	0
	01	0	0	0	0	46,743	0	8	46,751	0
*,** Ethylene oxide	98	16,698	1,140	14,521	1,043,190	11,154,805	190,063	660,945	13,081,362	54,419
	99	33,020	7,400	149,402	16	11,639,343	166,613	563,090	12,558,884	4,618
	00	263,388	20,000	178,077	5	18,503,554	144,207	519,119	19,628,350	9,531
	01	281,327	16,527	1,406,707	1,280	14,200,584	131,738	514,315	16,552,478	9,786
*,** Ethylene thiourea	98	430	565	0	0	0	8,632	6,635	16,262	0
	99	2,700	800	0	0	690,152	3,650	6,521	703,823	0
	00	2,750	580	0	0	85,108	3,771	2,351	94,560	0
	01	1,450	520	330	1,490	393,356	7,092	442	404,680	2
Ethylidene dichloride	98	1,600,000	0	2,981,278	10,275	2,368,003	4,551,900	44,442	11,555,898	89
	99	2,190,000	0	2,712,610	456	3,639,405	10,830	82,324	8,635,625	80
	00	1,400,000	103,754	4,746,196	347	2,324,500	15,759	15,054	8,605,610	96
	01	1,300,000	0	3,631,528	1,561	1,242,443	84,104	18,100	6,277,736	78
* Famphur	98	0	0	0	0	25,761	46,000	7	71,768	9
	99	0	0	0	0	25,757	2,200	4	27,961	5,612
	00	0	0	0	0	12,789	2,900	5	15,694	0
	01	0	0	0	0	0	5,550	0	5,550	0
* Fenarimol	98	0	0	0	0	0	0	0	0	0
	99	0	0	0	0	0	0	0	0	0
	00	0	0	0	0	0	0	0	0	0
	01	0	0	0	0	0	0	0	0	0
* Fenbutatin oxide	98	0	0	0	0	0	0	1,324	1,324	0
	99	0	0	0	33,822	0	0	1,324	35,146	0
	00	0	0	0	0	0	0	1,924	1,924	0
	01	0	0	0	0	0	0	1,444	1,444	0
* Fenoxaprop ethyl	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
* Fenoxycarb	98	0	0	0	0	40,000	0	1	40,001	0
	99	0	0	0	0	28,000	0	0	28,000	0
	00	0	0	0	0	23,000	0	0	23,000	0
	01	0	0	0	0	14,000	0	0	14,000	0

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
39515-41-8	*	Fenpropathrin	98	1	0	0	0	0	0	0	0
			99	1	0	0	0	0	0	0	0
			00	1	0	0	0	0	0	0	0
			01	No reports							
55-38-9	*	Fenthion	98	1	1	0	0	0	1	0	1
			99	No reports							
			00	1	1	0	0	0	1	0	1
			01	No reports							
51630-58-1	*	Fenvalerate	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
14484-64-1	*	Ferbam	98	No reports							
			99	No reports							
			00	No reports							
			01	2	6	0	0	0	6	505	511
69806-50-4	*	Fluazifop butyl	98	1	0	0	0	0	0	0	0
			99	2	0	0	0	0	0	0	0
			00	1	0	0	0	0	0	0	0
			01	1	0	0	0	0	0	0	0
2164-17-2	*	Fluometuron	98	5	782	0	0	0	782	745	1,527
			99	4	263	0	0	0	263	0	263
			00	3	15	0	0	0	15	0	15
			01	6	10	0	0	0	10	0	10
7782-41-4		Fluorine	98	12	121,020	49,857	0	90,778	261,655	0	261,655
			99	16	86,979	54,153	0	105,417	246,549	0	246,549
			00	14	8,764	40,274	0	174,979	224,017	70,009	294,026
			01	12	8,952	49,704	0	107,282	165,938	0	165,938
51-21-8		Fluorouracil	98	1	0	0	0	250	250	250	500
			99	1	0	0	0	250	250	500	750
			00	1	0	0	0	250	250	250	500
			01	1	0	0	0	250	250	250	500
69409-94-5	*	Fluvalinate	98	1	0	0	0	0	0	0	0
			99	1	0	0	0	0	0	0	0
			00	2	0	0	0	0	0	0	0
			01	2	0	0	0	0	0	0	0
133-07-3	*	Folpet	98	8	56	10	0	0	66	4,103	4,169
			99	6	36	10	0	0	46	3,023	3,069
			00	7	823	10	0	0	833	3,033	3,866
			01	5	16	0	0	0	16	1,887	1,903
72178-02-0		Fomesafen	98	3	884	1,532	0	0	2,416	9,191	11,607
			99	3	1,210	1,149	0	0	2,359	7,976	10,335
			00	3	1,298	1,176	0	0	2,474	6,740	9,214
			01	1	574	1,155	0	0	1,729	1,520	3,249
50-00-0	*,**	Formaldehyde	98	871	12,003,476	422,949	9,724,794	287,172	22,438,391	362,009	22,800,400
			99	859	12,398,989	430,424	10,880,865	313,776	24,024,054	191,813	24,215,867
			00	879	11,647,900	409,673	12,228,880	108,247	24,394,700	235,130	24,629,829
			01	799	10,582,327	336,112	9,872,146	150,327	20,940,912	530,774	21,471,686

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

	Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
*	Fenpropathrin	98	0	0	0	0	0	0	0	0	0
		99	0	0	0	0	0	0	0	0	0
		00	0	0	0	0	0	0	0	0	0
		01	No reports								
*	Fenthion	98	0	0	0	0	0	960	1	961	0
		99	No reports								
		00	0	0	0	0	0	1,976	1	1,977	0
		01	No reports								
*	Fenvalerate	98	No reports								
		99	No reports								
		00	No reports								
		01	No reports								
*	Ferbam	98	No reports								
		99	No reports								
		00	No reports								
		01	0	0	0	0	24,522	629	433	25,584	0
*	Fluazifop butyl	98	0	0	0	0	0	0	0	0	0
		99	0	0	0	0	0	0	0	0	0
		00	0	0	0	0	0	0	0	0	0
		01	0	0	0	0	0	0	0	0	0
*	Fluometuron	98	0	0	0	0	25,000	8,541	1,385	34,926	0
		99	0	0	0	0	37,000	2,512	1,680	41,192	0
		00	0	0	0	0	18,000	2,600	2,600	23,200	0
		01	0	0	0	0	19,000	0	10	19,010	0
	Fluorine	98	0	0	0	0	17,450	36,510	261,654	315,614	3
		99	0	0	0	0	58,420	20,435	246,339	325,194	32
		00	262,000	0	0	0	31,625	11,331	293,923	598,879	7
		01	0	0	0	0	18,973	240,196	166,237	425,406	1
	Fluorouracil	98	964	0	0	0	0	0	0	964	0
		99	1,188	0	0	0	0	0	0	1,188	0
		00	1,271	0	0	0	0	0	0	1,271	0
		01	1,205	0	0	0	0	0	0	1,205	0
*	Fluvalinate	98	0	0	0	0	0	0	0	0	0
		99	0	0	0	0	0	0	0	0	0
		00	0	0	0	0	0	0	0	0	0
		01	0	0	0	0	0	0	0	0	0
*	Folpet	98	2	0	0	0	2,100	0	4,121	6,223	0
		99	943	0	0	0	2,000	627	3,069	6,639	0
		00	1,630	0	0	0	0	728	3,741	6,099	0
		01	638	0	0	0	222	863	1,792	3,515	0
	Fomesafen	98	0	0	0	0	68,821	8,845	12,776	90,442	0
		99	0	0	0	0	79,083	1,522	11,035	91,640	0
		00	0	0	0	0	24,699	1,522	9,558	35,779	0
		01	0	0	0	0	6,061	6,552	3,249	15,862	0
*,**	Formaldehyde	98	101,307,900	591,297	14,716,713	1,955,107	94,285,500	3,688,822	22,253,049	238,798,388	16,008
		99	106,805,796	429,652	15,557,606	507,389	84,913,341	4,331,958	23,896,181	236,441,923	15,220
		00	94,280,657	252,231	23,233,920	722,584	179,860,139	6,445,977	25,107,229	329,902,737	4,498
		01	72,789,023	107,949	15,654,787	533,976	67,703,244	7,195,481	21,990,667	185,975,127	8,736

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	On-site Releases: Surface Water Discharges Pounds	On-site Releases: Underground Injection Pounds	On-site Releases: Releases to Land Pounds	On-site Releases: Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
64-18-6	*	Formic acid	98	328	958,986	96,187	11,168,924	68,923	12,293,020	50,010	12,343,030
			99	317	772,956	172,935	11,455,031	3,622	12,404,544	52,817	12,457,361
			00	324	768,799	278,857	8,645,752	4,270	9,697,678	56,348	9,754,026
			01	307	509,662	224,881	7,733,220	3,770	8,471,533	50,114	8,521,647
76-13-1		Freon 113	98	49	942,049	1,627	0	0	943,676	5,033	948,709
			99	37	841,256	1,933	0	9,955	853,144	5,480	858,624
			00	33	676,310	1,292	0	0	677,602	755	678,357
			01	31	574,408	1,295	0	15,165	590,868	7,889	598,757
--		Glycol ethers	98	2,331	38,406,614	193,192	1,620	58,318	38,659,744	711,121	39,370,865
			99	2,240	35,867,378	106,699	716	73,584	36,048,377	1,245,918	37,294,295
			00	2,225	31,425,960	111,511	45,224	65,402	31,648,097	3,969,734	35,617,831
			01	2,037	27,915,583	311,789	7,748	114,016	28,349,136	1,087,902	29,437,038
76-44-8	*,**	Heptachlor	98	6	137	0	5	0	142	12	154
			99	4	5	1	0	0	6	14	20
		Not comparable	00	15	6.60	0.00	0.00	2,372 56	2,379.16	221.87	2,601.03
		to prior years***	01	15	6 04	0.00	0.00	271.69	277.73	28.24	305.97
118-74-1	*,**	Hexachloro-	98	17	386	4	0	96	486	13,328	13,814
		benzene	99	20	571	8	0	13,023	13,602	1,506	15,108
		Not comparable	00	100	1,993.93	331.37	48.39	22,700.20	25,073.88	3,366.04	28,439.92
		to prior years***	01	99	1,199.39	321.61	22 02	23,524.57	25,067.59	11,107.40	36,174.98
87-68-3		Hexachloro-1,3-	98	14	2,660	255	5	0	2,920	990	3,910
		butadiene	99	12	4,427	2	0	22	4,451	100	4,551
			00	12	4,256	0	250	4	4,510	274	4,784
			01	11	1,599	5	5	1	1,610	1,086	2,696
319-84-6	**	alpha-Hexachloro-	98	No reports							
		cyclohexane	99	No reports							
			00	No reports							
			01	No reports							
77-47-4	*	Hexachlorocyclo-	98	8	5,801	0	250	5,520	11,571	1,067	12,638
		pentadiene	99	7	1,114	2	0	0	1,116	1,196	2,312
			00	9	1,310	0	0	0	1,310	2,186	3,496
			01	7	1,229	0	0	0	1,229	849	2,078
67-72-1	*,**	Hexachloroethane	98	22	45,812	0	295	0	46,107	1,324	47,431
			99	24	42,593	1	320	9,274	52,188	18,389	70,577
			00	21	33,444	5	612	3	34,064	2,558	36,622
			01	22	41,214	5	232	12,576	54,027	7,211	61,238
1335-87-1		Hexachloro-	98	No reports							
		naphthalene	99	No reports							
			00	No reports							
			01	No reports							
70-30-4	*	Hexachlorophene	98	1	0	0	0	0	0	0	0
			99	3	7	1	0	0	8	165	173
			00	3	0	0	0	0	0	5	5
			01	4	5	0	0	0	5	760	765
680-31-9	**	Hexamethylphos-	98	No reports							
		phoramide	99	No reports							
			00	1	0	0	0	0	0	0	0
			01	No reports							

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 nclude transfers to disposal sent to other TRI Facilities that reported the amount as an on-site release. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year NR not reportable (chemicals added to the TRI list after 1998)

No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

*** Data for PBT chemicals, due to threshold change for 2000 reporting year, are not comparable to prior year reporting See Chapter 3 for more information

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
* Formic acid	98	808,843	14	5,818,086	3,748,327	157,752,379	1,603,048	12,581,299	182,311,996	0
	99	710,746	10	6,613,867	1,732,416	137,624,348	1,392,709	12,664,055	160,738,151	100
	00	739,637	10	4,947,522	2,086,993	166,606,778	337,481	9,870,496	184,588,917	0
	01	819,420	862	7,643,418	2,472,681	145,659,437	400,235	8,516,176	165,512,229	837
Freon 113	98	483,320	74,026	39,916	118,829	1,171,267	5,306,608	938,704	8,132,670	6,305
	99	302,758	97,758	37,035	27,602	862,862	153,992	792,293	2,274,300	65,286
	00	107,843	159,715	0	13,515	858,942	150,354	677,360	1,967,729	179
	01	103,800	36,862	22,400	9,800	1,093,963	221,460	592,516	2,080,801	7,795
Glycol ethers	98	142,479,306	4,236,156	33,081,994	15,279,069	33,861,407	10,271,354	40,472,815	279,682,101	382,752
	99	166,616,127	4,259,872	45,009,889	14,773,014	45,479,647	10,740,314	38,392,777	325,271,640	12,375
	00	190,181,646	3,558,736	23,092,948	15,361,423	47,760,045	10,608,444	36,755,732	327,318,974	76,615
	01	168,887,650	2,755,475	22,470,532	14,502,861	42,702,429	8,905,822	30,290,997	290,515,766	120,006
*,** Heptachlor	98	0	0	0	0	443,474	35	153	443,662	0
	99	0	0	0	0	217,288	114	15	217,417	0
Not comparable	00	0.00	0.00	42.00	0.00	237,739.73	3,773.30	2,391.03	243,946 06	0.00
to prior years***	01	0.00	0.00	45.00	334.00	751,861.74	173.00	305.73	752,719 47	0.02
*,** Hexachloro-	98	8,100	1	114,000	54,632	1,663,762	18,252	13,724	1,872,471	0
benzene	99	6,601	26,253	98,000	40,950	5,630,476	22,986	27,188	5,852,454	7
Not comparable	00	6,000.50	12,039.00	140,662.00	56,585.00	6,154,926.17	19,461.15	39,342.58	6,429,016.40	22,915.02
to prior years***	01	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
Hexachloro-1,3-	98	0	0	15,200	0	4,572,141	162,354	3,013	4,752,708	410
butadiene	99	280,000	0	0	0	9,270,705	52,784	4,531	9,608,020	36,000
	00	250,000	0	26,548	69	332,474,140	29,574	4,285	332,784,616	13,350
	01	220,000	0	24,831	59	7,932,612	14,888	2,477	8,194,867	78,000
** alpha-Hexachloro-	98	No reports								
cyclohexane	99	No reports								
	00	No reports								
	01	No reports								
* Hexachlorocyclo-	98	0	0	0	552	904,715	2,795,884	6,762	3,707,913	4,800
pentadiene	99	0	0	0	388	537,591	10,813	2,157	550,949	84,000
	00	0	0	21,237	447	959,027	35,304	2,065	1,018,080	100,000
	01	0	0	19,863	47	340,460	28,345	2,066	390,781	38,000
*,** Hexachloroethane	98	1,100,000	0	1,134,700	87,615	4,162,437	52,879	46,344	6,583,975	36
	99	2,068,553	164,072	740,000	211,659	3,332,512	44,784	56,675	6,618,255	365
	00	970,000	57,963	422,097	68,539	116,210,518	48,981	36,563	117,814,661	1,141
	01	850,000	0	421,345	116,911	5,092,930	139,316	65,461	6,685,963	4,120
Hexachloro-	98	No reports								
naphthalene	99	No reports								
	00	No reports								
	01	No reports								
* Hexachlorophene	98	0	0	0	0	0	0	0	0	0
	99	0	0	0	0	219,953	0	168	220,121	0
	00	0	0	0	733	164,589	56	2	165,380	0
	01	0	0	330	1,491	202,871	84	109	204,885	0
** Hexamethylphos-	98	No reports								
phoramide	99	No reports								
	00	0	0	0	0	0	0	0	0	0
	01	No reports								

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

*** Data for PBT chemicals, due to threshold change for 2000 reporting year, are not comparable to prior year reporting See Chapter 3 for more information

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
110-54-3		n-Hexane	98	1,480	68,734,268	15,788	26,506	22,062	68,798,624	143,271	68,941,895
			99	1,457	56,561,924	14,197	41,994	7,988	56,626,103	76,727	56,702,830
			00	1,446	54,046,251	16,911	114,666	12,327	54,190,155	110,448	54,300,603
			01	1,372	47,644,345	10,531	69,663	9,943	47,734,482	427,958	48,162,440
51235-04-2	*	Hexazinone	98	5	266	2,215	0	0	2,481	750	3,231
			99	5	264	6,297	0	0	6,561	250	6,811
			00	4	2	1,874	0	0	1,876	0	1,876
			01	6	317	1,324	0	0	1,641	11,126	12,767
67485-29-4	*	Hydramethylnon	98	1	0	0	0	0	0	0	0
			99	2	10	0	0	750	760	0	760
			00	2	10	0	0	5	15	0	15
			01	2	10	0	0	5	15	0	15
302-01-2	**	Hydrazine	98	64	11,198	188	26,811	371	38,568	1,160	39,728
			99	62	10,278	642	88,378	372	99,670	522	100,192
			00	66	4,856	1,156	0	370	6,382	10	6,392
			01	57	3,068	57	0	120	3,245	260	3,505
10034-93-2	**	Hydrazine sulfate	98	1	0	0	200,000	0	200,000	0	200,000
			99	1	0	0	190,000	0	190,000	0	190,000
			00	1	0	0	150,000	0	150,000	0	150,000
			01	1	0	0	24,000	0	24,000	0	24,000
7647-01-0	*	Hydrochloric acid	98	1,528	612,369,433	2,576	100,099	22,266	612,494,374	1,029,678	613,524,052
			99	1,526	669,937,158	506	36,795	28,881	670,003,340	751,461	670,754,801
			00	1,524	654,455,553	96,763	54,125	15,459	654,621,900	1,313,609	655,935,509
			01	1,473	587,134,079	2,445	48,570	188,608	587,373,702	746,442	588,120,144
74-90-8	*	Hydrogen cyanide	98	77	2,076,148	308	590,597	112,523	2,779,576	2,729	2,782,305
			99	70	1,616,775	290	1,433,776	1,935	3,052,776	1,371	3,054,147
			00	67	1,587,147	281	688,362	761	2,276,551	2,125	2,278,676
			01	74	1,191,298	235	1,698,997	934	2,891,464	698	2,892,162
7664-39-3	*	Hydrogen fluoride	98	1,036	80,019,430	23,200	2,900,000	154,168	83,096,798	105,899	83,202,697
			99	1,035	72,987,874	16,995	4,100,000	134,273	77,239,142	91,743	77,330,885
			00	1,034	71,776,645	26,453	4,700,000	132,976	76,636,074	163,539	76,799,613
			01	991	67,248,474	21,549	4,400,000	279,575	71,949,598	136,470	72,086,068
123-31-9		Hydroquinone	98	63	13,867	1,558	347,309	0	362,734	27,893	390,627
			99	64	58,650	2,260	367,000	5	427,915	16,759	444,674
			00	66	12,990	4,170	333,200	16,281	366,641	893	367,534
			01	59	13,279	6,948	534,900	0	555,127	6,985	562,112
35554-44-0	*	Imazalil	98	1	0	0	0	0	0	10	10
			99	No reports							
			00	No reports							
			01	No reports							
55406-53-6	*	3-Iodo-2-propynyl butylcarbamate	98	21	3,393	10	0	291	3,694	7,352	11,046
			99	24	3,181	10	0	42,286	45,477	249,941	295,418
			00	27	3,362	10	0	41,564	44,936	50,644	95,580
			01	29	2,496	10	0	0	2,506	17,166	19,672
13463-40-6		Iron pentacarbonyl	98	1	1,475	0	0	0	1,475	0	1,475
			99	1	1,517	0	0	0	1,517	0	1,517
			00	3	1,283	0	0	4	1,287	4	1,291
			01	1	1,289	0	0	0	1,289	0	1,289

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

			Recycled		Energy Recovery		Treated				
	Chemical	Year	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
	n-Hexane	98	769,360,268	13,874,749	42,541,590	30,711,503	71,906,362	6,290,973	68,411,669	1,003,097,114	99,592
		99	352,667,049	11,634,577	54,912,112	28,597,291	67,880,860	7,372,479	55,803,180	578,867,548	357,922
		00	269,287,607	7,788,231	42,175,899	19,601,139	63,510,882	5,949,323	55,007,121	463,320,203	134,989
		01	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
*	Hexazinone	98	0	0	0	0	110,000	201,891	8,580	320,471	0
		99	0	0	0	0	71,000	164,269	13,155	248,424	0
		00	0	0	0	0	1,031	157,038	1,876	159,945	0
		01	0	0	0	0	166,675	193,662	1,415	361,752	0
*	Hydramethylnon	98	0	0	0	0	0	0	24	24	0
		99	0	0	0	0	0	0	5	5	5
		00	0	0	0	0	0	3,382	0	3,382	0
		01	0	0	0	0	0	6,566	1	6,567	0
**	Hydrazine	98	25	0	0	2,059	279,414	302,545	64,652	648,695	1
		99	25	0	5	45	517,251	142,351	142,113	801,790	3
		00	25	0	0	0	506,164	5,247	5,435	516,871	0
		01	25	0	330	1,491	217,189	18,668	2,804	240,507	0
**	Hydrazine sulfate	98	0	0	0	0	0	0	200,000	200,000	0
		99	0	0	0	0	0	0	190,000	190,000	0
		00	0	0	0	0	0	0	150,000	150,000	0
		01	0	0	0	0	0	0	24,000	24,000	0
*	Hydrochloric acid	98	61,757,568	2,681,128	190,000	243,927	891,527,596	6,353,452	613,359,742	1,576,113,413	173,578
		99	30,917,630	1,284,131	190,000	16,119	1,673,906,883	8,064,880	669,148,378	2,383,528,021	382,561
		00	41,366,411	3,711,351	5,841,928	4,773	1,813,606,470	9,596,531	655,485,445	2,529,612,909	238,442
		01	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
*	Hydrogen cyanide	98	110,701	0	24,442,117	0	21,306,166	473	2,772,620	48,632,077	288
		99	146,979	0	27,900,378	0	19,590,811	2,675	3,029,677	50,670,520	184
		00	119,477	0	49,890,083	0	19,821,228	12,857	2,264,307	72,107,952	13,955
		01	145,702	0	8,654,669	0	28,385,179	1,327	2,851,558	40,038,435	37,391
*	Hydrogen fluoride	98	53,583,453	156,245	0	4,910	230,504,806	2,303,950	83,202,618	369,755,982	11,196
		99	60,224,429	145,973	0	1,614	210,061,002	2,413,731	76,908,967	349,755,716	63,468
		00	80,991,919	1,877,343	0	14,120	247,656,239	1,915,039	77,271,201	409,725,861	70,290
		01	23,795,926	251,203	0	321	234,268,236	2,025,929	73,040,511	333,382,126	251,997
	Hydroquinone	98	3,200	0	848,845	10,066	490,754	126,922	375,059	1,854,846	0
		99	31,960	0	929,456	49,575	762,432	159,207	445,424	2,378,054	10
		00	1,500	0	1,131,108	8,615	1,437,003	114,313	374,566	3,067,105	0
		01	7,000	0	1,094,660	15,385	706,412	90,949	571,260	2,485,666	0
*	Imazalil	98	0	0	0	0	0	15	0	15	15
		99	No reports								
		00	No reports								
		01	No reports								
*	3-Iodo-2-propynyl butylcarbamate	98	30,906	0	400	5,561	334	123,399	6,271	166,871	0
		99	21,705	0	0	974	329	340,696	53,381	417,085	0
		00	118,785	0	0	2,007	322	182,186	63,399	366,699	0
		01	29,565	1,800	0	2,093	37,914	62,240	15,400	149,012	0
	Iron pentacarbonyl	98	0	0	0	0	0	0	1,475	1,475	0
		99	0	0	0	0	0	0	1,517	1,517	0
		00	0	0	0	0	10,248	0	1,283	11,531	0
		01	0	0	0	0	0	0	1,289	1,289	0

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
78-84-2		Isobutyraldehyde	98	22	254,625	1,182	0	0	255,807	172,238	428,045
			99	20	259,971	966	0	0	260,937	124,062	384,999
			00	19	230,956	129	0	0	231,085	150,261	381,346
			01	19	245,973	877	0	0	246,850	17,693	264,543
465-73-6	*	Isodrin	98	No reports	No reports	No reports	No reports	No reports	No reports	No reports	No reports
			99	No reports	No reports	No reports	No reports	No reports	No reports	No reports	No reports
		Not comparable	00	6	0.05	0.00	2.95	0 00	3 00	0.00	3 00
		to prior years***	01	5	0.35	0.00	0.00	19 00	19.35	441.40	460.75
25311-71-1	*	Isofenphos	98	2	10	0	0	0	10	0	10
			99	2	205	0	0	0	205	0	205
			00	No reports							
			01	No reports							
67-63-0	*	Isopropyl alcohol	98	80	603,142	250	192,117	0	795,509	59,649	855,158
		(strong acid	99	77	550,580	165	0	9	550,754	94,475	645,229
		manufacturing	00	28	99,133	0	0	4,120	103,253	3,785	107,038
		only)	01	16	21,981	0	0	0	21,981	3,574	25,555
80-05-7		4,4'-Isopropyli-	98	138	190,550	7,681	0	123,520	321,751	1,054,716	1,376,467
		denediphenol	99	133	171,497	4,798	72	40,022	216,389	965,715	1,182,104
			00	136	162,425	6,727	217	40,701	210,070	953,248	1,163,318
			01	131	127,046	5,472	177	28,385	161,080	917,513	1,078,593
120-58-1		Isosafrole	98	1	0	0	0	0	0	0	0
			99	1	2	1	0	0	3	38	41
			00	2	0	0	0	0	0	260	260
			01	2	0	0	0	0	0	505	505
77501-63-4	*	Lactofen	98	1	3	0	0	0	3	0	3
			99	2	406	0	0	0	406	9	415
			00	2	290	0	0	0	290	0	290
			01	2	3	0	0	0	3	0	3
7439-92-1	**	Lead	98	896	313,185	13,253	31,681	15,100,503	15,458,622	4,784,878	20,243,500
		2001 not	99	867	295,174	8,169	13,250	9,612,950	9,929,543	4,777,919	14,707,462
		comparable to	00	944	266,200 96	14,629 16	60,110 00	10,831,119 00	11,172,059 12	4,508,616 27	15,680.675 39
		prior years****	01	4,201	378,740 71	51,297 37	6 65	15,304,665 99	15,734,710 71	5,079,312 56	20,814.023 27
--	**	Lead compounds	98	1,121	1,205,707	115,966	7,451,799	255,938,366	264,711,837	21,894,093	286,605,930
		2001 not	99	1,069	1,221,563	65,682	8,142,009	280,339,312	289,768,565	23,966,427	313,734,992
		comparable to	00	1,081	1,229,604 48	80,479.65	8,512,731.00	328,885,588.00	338,708,403.13	19,794,610.67	358,503,013.80
		prior years****	01	4,360	1,254,380.94	362,122.44	6,232,814.69	364,115,208 54	371,964,526.62	50,213,158.38	422,177,685.00
58-89-9	*,**	Lindane	98	16	79	5	0	25,654	25,738	129	25,867
			99	14	30	6	0	0	36	369	405
			00	10	12	5	0	0	17	17	34
			01	10	13	0	0	274	287	256	543
330-55-2	*	Linuron	98	3	1,015	5	0	0	1,020	750	1,770
			99	4	1,015	5	0	0	1,020	750	1,770
			00	3	1,010	5	0	0	1,015	750	1,765
			01	3	10	5	0	0	15	0	15
554-13-2		Lithium carbonate	98	43	8,144	250	114	32,284	40,792	292,407	333,199
			99	48	12,263	501	0	11,632	24,396	192,891	217,287
			00	49	18,922	268	0	108,368	127,558	189,929	317,487
			01	47	10,343	5	0	71,193	81,541	243,561	325,102

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)

No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information) For lead compounds, applies only to inorganic lead compounds

*** Data for PBT chemicals, due to threshold change for 2000 reporting year, are not comparable to prior year reporting See Chapter 3 for more information

**** Data for lead (a PBT chemical) and lead compounds (a PBT chemical category), due to threshold change for 2001 reporting year, are not comparable to prior year reporting See Chapter 3 for more information

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

			Recycled		Energy Recovery		Treated				
	Chemical	Year	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
	Isobutyraldehyde	98	0	48,000	1,509,037	582,178	1,134,091	118,833	429,216	3,821,355	221
		99	10,188	3,800	2,902,392	539,410	1,180,083	36,804	403,453	5,076,130	0
		00	11,321	1,200	1,624,049	518,098	1,096,242	78,610	382,891	3,712,411	0
		01	9,583	1,900	839,785	575,751	850,872	97,179	263,271	2,638,341	0
*	Isodrin	98	No reports	No reports	No reports	No reports	No reports	No reports	No reports	No reports	No reports
		99	No reports	No reports	No reports	No reports	No reports	No reports	No reports	No reports	No reports
	Not comparable	00	0.00	0.00	0.00	0 00	6,603.84	0.00	3.00	6,606 84	0 00
	to prior years***	01	0.00	0.00	0.00	0.00	3,800.00	142.00	465.19	4,407.19	0.00
*	Isofenphos	98	2,000	0	0	0	0	114	10	2,124	0
		99	20,000	0	0	0	0	0	210	20,210	0
		00	No reports								
		01	No reports								
*	Isopropyl alcohol	98	135,846	146,022	3,681,484	1,050,303	323,436	133,468	835,508	6,306,067	0
	(strong acid	99	1,961,232	32,237	8,862,061	992,806	397,400	112,674	551,924	12,910,334	10
	manufacturing	00	111,416	0	8,128	909,081	0	12,310	588,557	1,629,492	10
	only)	01	92,968	0	0	377,275	26,538	113,158	36,213	646,152	0
	4,4'-Isopropyli-	98	104,158	71,832	9,043,549	98,999	1,777,772	267,511	1,405,174	12,768,995	3,476
	denediphenol	99	229,868	54,608	24,844,350	421,160	862,180	835,304	1,160,265	28,407,735	3,879
		00	144,861	53,743	18,345,193	3,328,793	695,393	424,815	1,139,386	24,132,184	0
		01	66,649	117,522	17,084,603	2,358,320	713,277	189,672	1,070,824	21,600,867	80
	Isosafrole	98	0	0	0	0	0	0	0	0	0
		99	0	0	0	0	77,000	0	37	77,037	0
		00	0	0	0	0	68,096	794	20	68,910	0
		01	0	0	330	80	104,417	560	527	105,914	0
*	Lactofen	98	0	0	0	0	0	89	3	92	0
		99	0	0	0	0	0	156	406	562	0
		00	0	0	0	0	0	346	290	636	0
		01	0	0	0	0	0	284	3	287	0
**	Lead	98	249,087,930	38,157,639	242,740	20,841	1,620,424	882,299	20,505,022	310,516,895	424,995
	2001 not	99	213,589,811	37,287,780	0	2,724	2,044,831	722,515	14,626,166	268,273,827	7,701
	comparable to	00	192,686,784 00	39,117,106 99	13,780 00	4,580 00	3,051,196 60	394,342 36	16,656,244 58	251,924,034 53	270,853 02
	prior years****	01	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	98	429,235,390	298,406,363	0	41,351	308,513	3,245,299	297,373,251	1,028,610,167	1,557,001
	2001 not	99	443,620,283	280,769,029	700	15,768	583,275	2,683,821	280,963,662	1,008,636,538	68,137,418
	comparable to	00	452,938,123.00	245,379,326.00	35.00	1,795.00	549,833.00	4,174,260.05	350,478,308.07	1,053,521,680.12	19,105,691.00
	prior years****	01	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
*,**	Lindane	98	168	0	0	100,903	118,134	8,386	25,959	253,550	0
		99	1,131	0	0	0	350,078	2,719	237	354,165	0
		00	225	0	0	0	331,156	965	34	332,380	0
		01	188	0	0	0	524,429	1,739	319	526,675	205
*	Linuron	98	25	0	0	2,214	14,516	500	554	17,809	0
		99	25	0	0	0	33,900	1,199	553	35,677	0
		00	25	0	0	0	17,951	500	530	19,006	0
		01	25	0	0	0	24,083	1	30	24,139	0
	Lithium carbonate	98	48,373	0	0	0	1,400	3,266	301,392	354,431	0
		99	94,352	0	0	0	5,258	3,909	215,931	319,450	16
		00	28,887	0	0	0	10,098	7,311	314,120	360,416	0
		01	30,000	0	0	0	5,998	8,769	323,996	368,763	0

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)

No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information) For lead compounds, applies only to inorganic lead compounds

*** Data for PBT chemicals, due to threshold change for 2000 reporting year, are not comparable to prior year reporting See Chapter 3 for more information

**** Data for lead (a PBT chemical) and lead compounds (a PBT chemical category), due to threshold change for 2001 reporting year, are not comparable to prior year reporting See Chapter 3 for more information

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	On-site Releases: Surface Water Discharges Pounds	On-site Releases: Underground Injection Pounds	On-site Releases: Releases to Land Pounds	On-site Releases: Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
121-75-5	*	Malathion	98	23	2,027	255	0	20,222	22,504	1,163	23,667
			99	20	5,098	5	0	0	5,103	38	5,141
			00	21	3,904	10	0	0	3,914	268	4,182
			01	22	3,849	255	5	0	4,109	505	4,614
108-31-6		Maleic anhydride	98	218	357,400	11	0	154,430	511,841	35,141	546,982
			99	217	378,798	6	0	66,449	445,253	5,986	451,239
			00	214	232,311	5	6	299	232,621	42,930	275,551
			01	212	301,869	11	0	5	301,885	45,265	347,150
109-77-3		Malononitrile	98	5	510	0	111,100	0	111,610	0	111,610
			99	5	17	6	150,985	5	151,013	163	151,176
			00	4	0	0	255,157	0	255,157	5	255,162
			01	5	5	0	26,953	0	26,958	260	27,218
12427-38-2	*	Maneb	98	7	5	0	0	0	5	2,288	2,293
			99	6	0	0	0	0	0	0	0
			00	5	10	0	0	0	10	250	260
			01	7	271	0	0	0	271	2,489	2,760
7439-96-5		Manganese	98	1,968	1,202,332	418,523	3	24,930,378	26,551,236	16,181,939	42,733,175
			99	2,008	1,182,099	287,357	5	22,566,902	24,036,363	14,237,202	38,273,565
			00	1,976	932,992	353,419	2,600	18,834,978	20,123,989	11,756,721	31,880,710
			01	1,862	904,434	165,392	0	16,332,501	17,402,327	31,582,035	48,984,362
--		Manganese compounds	98	1,661	2,153,013	6,723,093	8,621,610	518,701,498	536,199,214	50,546,158	586,745,372
			99	1,710	2,474,200	6,562,299	8,198,127	424,389,790	441,624,416	45,732,843	487,357,259
			00	1,795	2,215,706	6,863,947	10,829,146	415,959,145	435,867,944	52,112,268	487,980,212
			01	1,779	1,877,226	6,236,782	12,481,513	331,701,802	352,297,323	47,995,623	400,292,945
93-65-2	**	Mecoprop	98	10	1,150	0	0	250	1,400	3,968	5,368
			99	13	1,125	0	0	250	1,375	2,432	3,807
			00	14	659	0	0	250	909	1,113	2,022
			01	14	671	0	0	250	921	7,228	8,149
149-30-4	*	2-Mercaptobenzo-thiazole	98	39	5,792	100,823	45,000	250,250	401,865	146,951	548,816
			99	36	5,696	66,893	37,000	176,304	285,893	140,100	425,993
			00	32	4,340	35,288	10,000	166,126	215,754	223,095	438,849
			01	33	3,908	50,561	12,000	29,312	95,781	338,772	434,553
7439-97-6	*	Mercury	98	34	22,007	134	0	239,072	261,213	29,241	290,454
			99	46	20,652	133	0	100,735	121,520	21,432	142,952
		Not comparable to prior years***	00	572	29,104.88	409.41	1,376.70	37,384.83	68,275.82	25,230.57	93,506.38
			01	537	24,698.08	341.73	460.40	31,760.89	57,261.10	76,715.67	133,976.77
--		Mercury compounds	98	23	7,557	56	0	8,971,660	8,979,273	92,650	9,071,923
			99	33	5,903	45	0	2,974,015	2,979,963	142,219	3,122,182
		Not comparable to prior years***	00	1,055	132,538 16	2,017 96	10,336.82	3,247,666.58	3,392,559 52	829,237.21	4,221,796.73
			01	1,128	125,764.77	1,463.42	9,315.75	4,484,228.72	4,620,772.66	151,567.27	4,772,339.93
150-50-5	*	Merphos	98	1	0	0	0	0	0	0	0
			99	1	0	13	0	0	13	0	13
			00	2	0	4	0	0	4	270	274
			01	1	0	6	0	0	6	0	6
126-98-7		Methacrylonitrile	98	8	1,700	0	107,076	0	108,776	0	108,776
			99	9	1,062	1	102,418	22,932	126,413	12,387	138,800
			00	10	1,241	0	59,399	0	60,640	260	60,900
			01	9	1,245	0	51,371	0	52,616	505	53,121

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)

No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

*** Data for PBT chemicals, due to threshold change for 2000 reporting year, are not comparable to prior year reporting See Chapter 3 for more information

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

	Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
*	Malathion	98	1,187	0	0	0	180,176	1,841	22,039	205,243	0
		99	418	97	0	0	240,221	4,118	4,629	249,483	0
		00	215	0	0	68,367	160,786	71,538	3,892	304,798	0
		01	15	0	0	47,000	151,332	17,032	4,097	219,476	1
	Maleic anhydride	98	7,607	250	3,857,500	219,433	50,715,151	1,404,589	538,016	56,742,546	12,599
		99	4,507	272	2,724,748	323,688	43,803,989	1,463,535	438,907	48,759,646	1,527
		00	5,907	0	5,226,962	404,459	37,916,665	862,882	269,203	44,686,078	796
		01	67,546	0	7,339,361	136,826	43,955,930	1,021,214	304,222	52,825,099	1,697
	Malononitrile	98	0	0	0	0	336,000	0	111,214	447,214	0
		99	0	0	0	0	213,547	0	151,175	364,722	0
		00	0	0	0	0	150,447	785	255,159	406,391	0
		01	0	0	0	0	143,067	1,564	26,975	171,606	0
*	Maneb	98	35	0	0	0	0	8,521	2,058	10,614	0
		99	0	0	0	0	0	10,113	2,853	12,966	0
		00	0	0	0	0	93,463	2,096	1	95,560	0
		01	11,650	0	0	0	12,886	9,902	899	35,337	595
	Manganese	98	39,087,103	56,441,238	0	543	645,755	889,214	40,132,267	137,196,120	623,751
		99	42,777,882	78,596,484	0	1	202,172	526,595	36,459,507	158,562,641	18,809,964
		00	41,786,949	66,393,848	0	25	102,062	406,851	30,099,124	138,788,859	211,910
		01	13,806,776	80,575,895	0	0	119,178	274,508	25,432,758	120,209,115	68,026
	Manganese compounds	98	17,416,504	48,128,615	22,153	35,980	1,919,079	5,428,320	590,587,734	663,538,385	403,227
		99	19,582,196	46,328,928	2,876	58,511	1,549,833	1,452,797	445,178,108	514,153,249	47,158,128
		00	44,283,624	49,568,223	776	51,636	3,301,004	1,357,509	473,025,650	571,588,422	20,585,670
		01	23,174,873	46,947,185	3,748	0	846,053	521,713	406,131,471	477,625,043	2,528,743
**	Mecoprop	98	872	0	0	1,000	500	451	4,887	7,710	0
		99	2,611	0	0	0	12,319	632	3,654	19,216	0
		00	5,179	0	0	0	160	5,348	1,869	12,556	0
		01	4,220	0	0	0	163	4,686	7,515	16,584	0
*	2-Mercaptobenzo-thiazole	98	1,780	8,475	0	800,961	513,059	76,774	548,521	1,949,570	0
		99	207,850	50,116	0	601,890	527,221	11,170	431,762	1,830,009	0
		00	465,590	41,684	0	300,358	596,634	9,247	442,877	1,856,390	0
		01	203,818	16,712	0	93,106	560,520	210,397	273,526	1,358,079	0
*	Mercury	98	455,629	37,773	0	0	4,315	1,161	281,046	779,924	0
		99	471,573	42,572	0	0	4,021	5,389	140,970	664,525	10
	Not comparable	00	301,682.95	70,151.61	67.73	14.01	365.23	3,054.07	90,612.65	465,948.24	4,903.71
	to prior years***	01	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	98	638,426	114,143	0	0	0	5,647	9,065,092	9,823,308	860
	compounds	99	502,455	90,252	0	0	5,900	780	3,100,706	3,700,093	17,400
	Not comparable	00	408,124.16	97,530.22	10.00	57.00	23,595.65	561.46	3,949,318.74	4,479,197.23	13,240.17
	to prior years***	01	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
*	Merphos	98	0	0	0	0	0	0	0	0	0
		99	0	0	0	0	155	12	13	180	0
		00	0	0	0	0	185	274	4	463	0
		01	0	0	0	0	345	0	6	351	0
	Methacrylonitrile	98	0	0	0	1,891,340	500	0	108,776	2,000,616	0
		99	0	0	0	0	73,419	0	138,799	212,218	0
		00	0	0	0	0	88,594	809	60,411	149,814	45
		01	0	1,672	330	5,327	81,060	5,364	52,936	146,689	0

Note: Data from Section 8 (Current Year) of Form R.

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

*** Data for PBT chemicals, due to threshold change for 2000 reporting year, are not comparable to prior year reporting See Chapter 3 for more information

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
137-42-8	*	Metham sodium	98	11	6,538	40	0	22,358	28,936	800	29,736
			99	10	9,984	40	0	110	10,134	220	10,354
			00	10	9,362	40	0	0	9,402	15	9,417
			01	12	10,531	40	0	0	10,571	0	10,571
67-56-1	*	Methanol	98	2,637	190,667,969	5,791,609	17,806,788	2,406,308	216,672,674	969,073	217,641,747
			99	2,559	186,725,936	3,871,163	16,182,918	1,955,983	208,736,000	1,468,724	210,204,724
			00	2,537	181,836,899	3,746,358	18,353,232	1,817,006	205,753,495	1,282,338	207,035,833
			01	2,418	175,844,606	3,380,299	13,457,822	1,452,016	194,134,743	2,829,290	196,964,033
20354-26-1	*	Methazole	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
2032-65-7	*	Methiocarb	98	2	0	0	0	0	0	0	0
			99	1	0	0	0	0	0	0	0
			00	No reports							
			01	1	0	0	0	0	0	0	0
94-74-6	*,**	Methoxone	98	6	1,255	0	0	250	1,505	3,749	5,254
			99	7	782	0	0	250	1,032	3,201	4,233
			00	6	758	0	0	250	1,008	895	1,903
			01	4	751	0	0	750	1,501	8,754	10,255
3653-48-3	*,**	Methoxone, sodium salt	98	No reports							
			99	No reports							
			00	No reports							
			01	1	0	0	0	0	0	0	0
72-43-5	*	Methoxychlor	98	8	12	0	0	25,474	25,486	0	25,486
			99	8	29	0	0	0	29	14	43
		Not comparable	00	21	59.83	0.00	0.00	2,569.00	2,628.83	31.75	2,660.58
		to prior years***	01	15	25.19	0.00	0.00	334.69	359.88	95.93	455.81
109-86-4	*	2-Methoxyethanol	98	66	1,020,149	16,882	51,963	400	1,089,394	968	1,090,362
			99	55	972,470	20,649	0	73,098	1,066,217	17,434	1,083,651
			00	49	886,237	22,286	0	18,241	926,764	61,915	988,679
			01	46	856,142	31,924	0	11,282	899,348	66,021	965,369
96-33-3		Methyl acrylate	98	72	270,583	761	53,244	14,000	338,588	54,255	392,843
			99	67	305,391	624	51,742	267	358,024	527,718	885,742
			00	67	320,278	294	13,670	0	334,242	26,857	361,099
			01	64	241,299	453	31,164	120,000	392,916	120,754	513,670
1634-04-4		Methyl tert-butyl ether	98	543	4,227,190	66,347	47,607	3,209	4,344,353	262,894	4,607,247
			99	499	3,772,019	121,185	20,477	6,606	3,920,287	260,753	4,181,040
			00	479	3,446,857	123,533	31,236	10,556	3,612,182	33,795	3,645,977
			01	477	3,289,087	63,575	35,962	4,255	3,392,879	23,855	3,416,734
79-22-1		Methyl chloro-carbonate	98	5	2,352	5	0	5	2,362	0	2,362
			99	7	3,234	6	0	5	3,245	162	3,407
			00	8	2,993	5	0	5	3,003	10	3,013
			01	9	3,620	5	0	5	3,630	260	3,890
101-14-4	**	4,4'-Methylenebis (2-chloroaniline)	98	24	20	0	0	0	20	0	20
			99	20	40	1	0	8,189	8,230	4,419	12,649
			00	23	15	0	0	26,154	26,169	10	26,179
			01	21	13	0	0	14,195	14,208	505	14,713

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)

No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

*** Data for PBT chemicals, due to threshold change for 2000 reporting year, are not comparable to prior year reporting. See Chapter 3 for more information

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

			Recycled		Energy Recovery		Treated				
	Chemical	Year	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
*	Metham sodium	98	100	0	0	0	355	3,324	30,746	34,525	1,000
		99	9,100	0	0	0	748	16,442	10,466	36,756	100
		00	0	0	0	843	1,190	8,911	9,651	20,595	40
		01	0	0	0	259	360	6,613	10,603	17,835	0
*	Methanol	98	624,345,837	13,003,938	307,586,241	130,161,321	1,079,745,342	128,628,815	218,971,546	2,502,443,040	112,046
		99	626,044,860	23,862,136	424,211,589	125,192,324	1,101,948,397	119,361,184	211,718,944	2,632,339,434	195,449
		00	597,755,128	18,685,908	373,940,816	149,172,431	1,216,448,329	131,388,712	214,469,494	2,701,860,817	259,055
		01	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
*	Methazole	98	No reports								
		99	No reports								
		00	No reports								
		01	No reports								
*	Methiocarb	98	0	0	0	0	0	0	0	0	0
		99	0	0	0	0	0	0	0	0	0
		00	No reports								
		01	0	0	0	0	0	0	0	0	0
*,**	Methoxone	98	6,670	0	0	0	0	1,301	5,417	13,388	0
		99	1,092	0	0	0	110,530	723	4,323	116,668	0
		00	3,007	0	0	0	90,180	4,208	2,280	99,675	0
		01	6,347	0	0	0	0	4,612	9,369	20,328	0
*,**	Methoxone, sodium salt	98	No reports								
		99	No reports								
		00	No reports								
		01	0	0	0	0	0	0	0	0	0
*	Methoxychlor	98	0	0	0	0	30,194	0	25,486	55,680	0
		99	0	0	0	0	206,422	0	43	206,465	0
	Not comparable	00	0.00	0.00	225.00	755.00	290,474.16	431.60	2,662.64	294,548.40	0.00
	to prior years***	01	0.00	0.00	569.00	1,376.00	319,545.30	231.40	12,093.69	333,815.39	0.00
*	2-Methoxyethanol	98	279,837	151,007	742,247	3,040,111	3,493,759	499,209	1,146,749	9,352,919	402
		99	711,053	200,000	1,236,963	545,620	3,845,705	496,600	1,076,305	8,112,246	0
		00	940,000	100,000	1,341,175	573,592	3,665,410	438,169	917,647	7,975,993	428
		01	470,000	0	84,334	587,705	3,884,482	210,638	903,133	6,140,292	0
	Methyl acrylate	98	1,067,301	0	702,681	749,967	3,412,915	75,631	440,888	6,449,383	25,186
		99	942,001	140	545,151	655,257	2,440,430	232,465	383,057	5,198,501	498,921
		00	938,941	70	558,435	774,057	1,937,752	98,709	361,255	4,669,219	0
		01	992,232	43	2,793,395	953,548	3,020,126	31,560	395,149	8,186,053	0
	Methyl tert-butyl ether	98	5,009,986	1,970,675	1,798,255	3,518,135	9,069,403	1,432,160	6,417,133	29,215,747	34,476
		99	8,459,734	136,286	2,068,570	4,482,937	21,357,151	1,290,265	3,883,367	41,678,310	303,259
		00	6,246,105	323,466	3,801,059	5,879,252	16,730,599	1,337,075	3,915,783	38,233,339	11,647
		01	9,350,579	221,280	4,066,574	5,249,715	10,815,904	2,764,744	3,348,578	35,817,374	16,030
	Methyl chloro-carbonate	98	0	0	0	0	51,910	0	3,030	54,940	0
		99	0	0	0	0	213,662	0	3,213	216,875	0
		00	0	0	0	0	175,299	790	3,235	179,324	0
		01	0	0	0	0	254,399	91,383	3,137	348,919	0
**	4,4'-Methylenebis (2-chloroaniline)	98	0	0	0	4,169	0	9,787	10	13,966	0
		99	0	0	0	2,997	133,212	9,305	12,641	158,155	0
		00	0	0	0	8,910	123,238	6,402	26,168	164,718	0
		01	0	0	0	1,241	134,740	15,480	14,738	166,199	0

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

*** Data for PBT chemicals, due to threshold change for 2000 reporting year, are not comparable to prior year reporting See Chapter 3 for more information

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
101-61-1	**	4,4'-Methylenebis (N,N-dimethyl) benzenamine	98	1	0	0	0	0	0	0	0
			99	1	0	0	0	0	0	0	0
			00	1	0	0	0	0	0	0	0
			01	No reports							
74-95-3		Methylene bromide	98	8	46,313	0	0	0	46,313	0	46,313
			99	4	12,367	1	0	0	12,368	36	12,404
			00	5	4,585	0	0	0	4,585	32,861	37,446
			01	6	5,258	0	0	0	5,258	505	5,763
101-77-9	**	4,4'-Methylene-dianiline	98	26	9,073	5,041	51,200	0	65,314	6,867	72,181
			99	24	9,199	4,248	33,000	8	46,455	31,768	78,223
			00	23	12,908	296	30,000	8	43,212	6,550	49,762
			01	23	17,085	110	57,000	0	74,195	2,483	76,678
78-93-3	*	Methyl ethyl ketone	98	2,205	46,975,314	55,944	395,669	118,437	47,545,364	1,060,022	48,605,386
			99	2,046	38,606,613	35,417	492,110	262,900	39,397,040	1,366,652	40,763,692
			00	1,977	34,449,072	40,688	250,249	127,838	34,867,847	1,019,810	35,887,657
			01	1,783	29,094,942	47,718	374,987	124,263	29,641,910	939,001	30,580,911
60-34-4		Methyl hydrazine	98	3	265	0	0	0	265	0	265
			99	6	407	0	0	0	407	195	602
			00	3	283	0	0	0	283	0	283
			01	6	399	0	0	0	399	0	399
74-88-4		Methyl iodide	98	12	65,167	45	131	1,357	66,700	329	67,029
			99	13	67,897	8	24	18,487	86,416	9,575	95,991
			00	14	71,912	22	8	1,002	72,944	74	73,018
			01	13	62,996	22	0	23,636	86,654	11,591	98,245
108-10-1	*	Methyl isobutyl ketone	98	1,045	15,086,349	17,655	76,200	13,891	15,194,095	203,083	15,397,178
			99	1,006	14,403,204	19,592	79,800	48,539	14,551,135	229,493	14,780,628
			00	972	13,046,066	33,004	78,905	63,259	13,221,234	122,368	13,343,602
			01	869	10,033,115	19,790	52,205	56,684	10,161,794	11,870,197	22,031,991
624-83-9		Methyl isocyanate	98	6	507	0	0	5	512	0	512
			99	6	442	0	0	1	443	153	596
			00	5	472	0	0	0	472	0	472
			01	5	472	0	0	0	472	0	472
556-61-6	*	Methyl isothio-cyanate	98	3	1,359	0	0	0	1,359	0	1,359
			99	3	1,091	0	0	0	1,091	0	1,091
			00	3	1,136	0	0	0	1,136	0	1,136
			01	3	1,079	0	0	0	1,079	0	1,079
75-86-5		2-Methyllacto-nitrile	98	10	12,283	0	80,698	0	92,981	147	93,128
			99	10	12,875	0	70,487	0	83,362	169	83,531
			00	8	12,011	0	160,007	0	172,018	76	172,094
			01	6	11,872	0	67,222	0	79,094	0	79,094
80-62-6		Methyl meth-acrylate	98	302	2,266,809	437,470	167,206	11,572	2,883,057	334,357	3,217,414
			99	319	2,640,069	3,344	62,000	51,564	2,756,977	532,849	3,289,826
			00	331	2,728,395	3,467	230,000	31,322	2,993,184	151,385	3,144,569
			01	324	2,566,372	2,440	189,000	64,747	2,822,559	99,258	2,921,817
924-42-5		N-Methylol-acrylamide	98	36	5,473	1,245	0	45	6,763	24,987	31,750
			99	35	6,178	1,259	0	53	7,490	3,648	11,138
			00	33	4,052	1,050	0	41	5,143	5,510	10,653
			01	32	5,571	1,141	0	33	6,745	13,206	19,951

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports. No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

	Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
**	4,4'-Methylenebis (N,N-dimethyl) benzenamine	98	0	0	0	0	0	0	0	0	0
		99	0	0	0	0	0	0	0	0	0
		00	0	0	0	0	0	0	0	0	0
		01	No reports								
	Methylene bromide	98	1,500,000	0	0	64,300	354,774	0	46,295	1,965,369	0
		99	40	0	0	0	37,000	0	12,367	49,407	0
		00	44	0	0	0	51,376	780	37,570	89,770	0
		01	7,100	0	0	290	86,272	1,645	5,557	100,864	0
**	4,4'-Methylene-dianiline	98	2,830	0	311,271	11,793	418,954	56,581	66,591	868,020	1
		99	6,205	0	45,995	4,157	276,152	99,971	48,589	481,069	8
		00	9,920	0	30,467	1,199	14,899	69,471	48,429	174,385	0
		01	6,760	0	7,909	2	88,133	58,562	76,312	237,678	1
*	Methyl ethyl ketone	98	73,514,991	21,519,094	81,005,382	74,787,749	86,399,514	13,000,816	48,944,350	399,171,896	181,577
		99	69,641,857	16,818,878	96,122,648	65,307,558	90,499,447	16,171,193	40,232,348	394,793,929	476,221
		00	62,580,803	15,829,562	99,171,052	67,188,111	85,345,303	12,076,923	36,961,450	379,153,204	398,282
		01	65,921,253	12,988,612	79,429,384	58,020,875	79,664,617	13,066,620	31,720,673	340,812,034	529,999
	Methyl hydrazine	98	0	0	0	0	6,508	192	370	7,070	0
		99	0	0	0	0	131,147	5,967	707	137,821	0
		00	0	0	0	0	74,624	4,345	388	79,357	0
		01	0	0	0	136	72,923	1,361	504	74,924	0
	Methyl iodide	98	0	0	0	0	184,842	31,143	66,328	282,313	420
		99	0	0	4,300	0	142,250	358	96,441	243,349	0
		00	50	0	4,900	0	131,316	65,735	71,833	273,834	99
		01	2,506	0	2,706	0	135,828	19,715	99,610	260,365	17
*	Methyl isobutyl ketone	98	64,091,017	10,919,686	28,664,973	26,399,376	16,230,666	4,323,900	15,373,844	166,003,462	168,341
		99	51,922,043	11,656,778	28,147,633	25,583,720	17,786,717	4,412,499	14,819,207	154,328,597	338,868
		00	57,425,477	11,685,428	20,181,943	20,977,740	20,810,099	4,122,567	13,931,968	149,135,222	374,168
		01	58,960,266	9,571,531	21,545,735	20,539,374	18,333,606	4,210,806	22,751,089	155,912,407	527,428
	Methyl isocyanate	98	0	0	0	3,450	90,771	0	497	94,718	5
		99	0	0	0	0	118,324	32	2,467	120,823	0
		00	0	0	0	0	155,129	0	471	155,600	0
		01	0	0	2	0	115,113	0	470	115,585	0
*	Methyl isothio-cyanate	98	0	0	0	0	0	120	1,359	1,479	0
		99	0	0	0	48	0	72	1,091	1,211	0
		00	0	0	0	338	0	113	1,136	1,587	0
		01	0	0	0	0	0	1,422	1,079	2,501	0
	2-Methyllacto-nitrile	98	0	0	0	0	9,268	9	93,541	102,818	1
		99	0	0	0	0	108,224	41,008	83,457	232,689	0
		00	0	0	0	0	79,077	11	172,061	251,149	0
		01	0	0	0	0	50,215	6	78,626	128,847	0
	Methyl meth-acrylate	98	1,546,426	58,753	2,254,439	2,736,835	4,966,709	588,108	3,227,985	15,379,255	8,246
		99	1,842,688	47,419	1,979,196	2,337,592	6,190,989	789,866	3,440,990	16,628,740	17,398
		00	1,741,478	96,940	4,385,587	2,599,061	5,650,546	803,394	3,117,511	18,394,517	1,361
		01	862,273	58,046	1,772,945	2,659,485	5,265,542	926,694	2,963,299	14,508,284	25,547
	N-Methylol-acrylamide	98	0	113	0	0	12,400	7,425	31,759	51,697	99
		99	0	120	0	0	12,607	8,373	11,151	32,251	0
		00	0	0	0	24,460	36,683	14,468	10,661	86,272	0
		01	0	0	0	66,000	10,413	2,386	14,822	93,621	0

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	On-site Releases: Surface Water Discharges Pounds	On-site Releases: Underground Injection Pounds	On-site Releases: Releases to Land Pounds	On-site Releases: Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
298-00-0	*	Methyl parathion	98	5	189	0	0	0	189	0	189
			99	6	15	0	0	0	15	0	15
			00	7	1	0	0	0	1	0	1
			01	7	10	0	0	0	10	201	211
109-06-8		2-Methylpyridine	98	8	3,008	0	38,900	0	41,908	813	42,721
			99	10	16,939	1	50,100	0	67,040	264	67,304
			00	11	19,846	22	24,000	0	43,868	10	43,878
			01	14	31,654	20	19,400	0	51,074	2,197	53,271
872-50-4		N-Methyl-2-pyrrolidone	98	486	3,070,838	43,231	2,865,692	99,411	6,079,172	498,719	6,577,891
			99	495	3,436,422	35,958	2,945,457	140,199	6,558,036	638,030	7,196,066
			00	495	3,208,888	19,392	2,022,037	150,160	5,400,477	926,179	6,326,656
			01	469	4,072,324	10,810	1,997,493	62,152	6,142,779	515,512	6,658,291
9006-42-2	*	Metiram	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
21087-64-9	*	Metribuzin	98	8	339	26	0	0	365	255	620
			99	10	397	68	0	1	466	250	716
			00	7	103	7	0	0	110	0	110
			01	7	269	31	0	0	300	2,636	2,936
7786-34-7	*	Mevinphos	98	1	0	0	0	0	0	0	0
			99	1	0	0	0	0	0	0	0
			00	No reports							
			01	No reports							
90-94-8	**	Michler's ketone	98	1	511	0	0	0	511	0	511
			99	2	869	0	0	0	869	0	869
			00	No reports							
			01	No reports							
2212-67-1	*	Molinate	98	3	1,063	113	0	0	1,176	8,305	9,481
			99	5	1,700	116	0	0	1,816	8,057	9,873
			00	4	1,585	105	0	0	1,690	3,243	4,933
			01	4	1,529	80	0	0	1,609	3,895	5,504
1313-27-5		Molybdenum trioxide	98	191	220,657	36,330	302,005	948,394	1,507,386	723,652	2,231,038
			99	194	115,098	38,305	117,120	672,703	943,226	1,295,752	2,238,978
			00	198	92,132	26,976	148,950	864,716	1,132,774	1,534,188	2,666,962
			01	191	74,943	24,759	120,500	685,897	906,099	1,206,755	2,112,854
76-15-3		Monochloropenta-fluoroethane (CFC-115)	98	8	83,108	5	0	0	83,113	0	83,113
			99	6	76,614	5	0	0	76,619	0	76,619
			00	5	61,449	5	0	0	61,454	0	61,454
			01	6	129,298	5	0	0	129,303	0	129,303
150-68-5	*	Monuron	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
505-60-2	**	Mustard gas	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

			Recycled		Energy Recovery		Treated				
	Chemical	Year	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
*	Methyl parathion	98	0	0	0	0	0	47,000	8,531	55,531	0
		99	0	0	0	0	21,609	23,992	6,501	52,102	0
		00	0	0	0	0	62,814	11,727	1	74,542	0
		01	0	0	0	138	70,710	20,534	7	91,389	0
	2-Methylpyridine	98	0	140,000	42,139	12	3	330	42,748	225,232	0
		99	0	170,000	34,963	5,110	307,656	1,475	67,342	586,546	1,000
		00	4,400	130,000	36,959	4,200	244,218	3,436	43,889	467,102	0
		01	0	57,000	20,064	4,830	238,996	13,017	65,627	399,534	20
	N-Methyl-2-pyrrolidone	98	9,242,463	7,409,130	2,830,016	6,120,328	6,156,958	4,229,123	6,692,035	42,680,053	4,486
		99	7,871,219	7,424,798	5,922,795	8,429,534	5,597,757	5,104,285	7,088,394	47,438,782	462
		00	7,630,886	16,772,438	5,023,190	17,416,116	6,758,468	3,635,667	6,098,755	63,335,520	1,062
		01	6,092,953	8,020,222	9,133,347	10,428,210	5,273,935	2,998,648	6,727,154	48,674,469	2,571
*	Metiram	98	No reports								
		99	No reports								
		00	No reports								
		01	No reports								
*	Metribuzin	98	0	0	0	0	4,596	48,209	140	52,945	0
		99	0	0	0	0	39,513	63,938	7,849	111,300	0
		00	0	0	0	0	24,393	21,199	7,307	52,899	0
		01	0	0	0	0	4,542	43,282	2,737	50,561	0
*	Mevinphos	98	0	0	0	0	0	0	0	0	0
		99	0	0	0	0	0	0	0	0	0
		00	No reports								
		01	No reports								
**	Michler's ketone	98	0	0	0	305	14,098	0	511	14,914	0
		99	0	0	290,000	309	11,720	86	632	302,747	0
		00	No reports								
		01	No reports								
*	Molinate	98	0	0	0	0	9,646	67,166	10,483	87,295	0
		99	0	0	0	0	15,857	16,348	7,273	39,478	2,504
		00	0	0	0	0	4,226	77,036	5,508	86,770	2,504
		01	0	0	0	0	3,460	24,091	5,602	33,153	11
	Molybdenum trioxide	98	3,589,437	2,925,092	0	0	175,000	526,540	3,284,148	10,500,217	110
		99	3,286,213	1,785,484	511	46,400	99,854	323,317	2,597,038	8,138,817	1,890
		00	1,720,245	2,326,702	0	21,023	59,784	178,193	2,726,202	7,032,149	90,313
		01	1,852,394	2,252,419	0	10	65,292	344,786	2,275,306	6,790,207	24,489
	Monochloropenta-fluoroethane (CFC-115)	98	2,000	36,230	0	0	3,137	258	81,597	123,222	1,512
		99	0	34,344	0	0	4,683	0	39,319	78,346	37,300
		00	8,013	2,348	0	0	4,129	0	61,454	75,944	0
		01	0	5,752	0	0	180,668	0	129,303	315,723	95
*	Monuron	98	No reports								
		99	No reports								
		00	No reports								
		01	No reports								
**	Mustard gas	98	No reports								
		99	No reports								
		00	No reports								
		01	No reports								

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	On-site Releases: Surface Water Discharges Pounds	On-site Releases: Underground Injection Pounds	On-site Releases: Releases to Land Pounds	On-site Releases: Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
88671-89-0	*	Myclobutanil	98	3	1,000	0	0	0	1,000	0	1,000
			99	5	1,000	0	0	0	1,000	0	1,000
			00	6	1,000	0	0	0	1,000	0	1,000
			01	3	0	0	0	0	0	0	0
142-59-6	*	Nabam	98	6	0	4,864	0	0	4,864	0	4,864
			99	4	0	0	0	0	0	0	0
			00	5	0	0	0	0	0	0	0
			01	7	0	0	0	0	0	0	0
300-76-5	*	Naled	98	1	0	0	0	0	0	0	0
			99	2	0	0	0	0	0	0	0
			00	2	0	0	0	0	0	0	0
			01	2	0	0	0	0	0	10	10
91-20-3	*	Naphthalene	98	774	3,516,555	34,520	191,682	1,273,506	5,016,263	963,317	5,979,580
			99	761	2,719,839	39,020	166,059	145,114	3,070,032	744,883	3,814,915
			00	750	2,361,365	48,939	205,934	131,729	2,747,967	329,508	3,077,475
			01	765	2,002,896	43,362	161,210	42,768	2,250,236	353,136	2,603,372
134-32-7	**	alpha-Naphthyl-amine	98	3	0	0	0	0	0	0	0
			99	5	7	1	0	0	8	164	172
			00	4	0	0	0	0	0	10	10
			01	4	0	0	0	0	0	260	260
91-59-8	**	beta-Naphthyl-amine	98	1	0	0	0	0	0	0	0
			99	1	2	1	0	0	3	5	8
			00	2	5	0	0	0	5	10	15
			01	2	5	0	0	0	5	260	265
7440-02-0	**	Nickel	98	2,349	752,671	30,987	129,812	5,281,714	6,195,183	7,718,987	13,914,170
			99	2,364	785,393	26,388	16,939	4,441,910	5,270,630	7,379,592	12,650,221
			00	2,362	653,640	25,266	16,562	1,998,680	2,694,148	6,455,462	9,149,609
			01	2,267	381,098	20,962	22,669	2,480,253	2,904,982	7,372,304	10,277,286
--	**	Nickel compounds	98	1,397	1,114,973	426,105	483,694	56,715,832	58,740,604	11,375,876	70,116,479
			99	1,412	1,180,455	246,927	391,010	56,000,381	57,818,773	10,851,863	68,670,636
			00	1,365	1,046,149	232,291	735,452	55,779,849	57,793,740	11,941,776	69,735,516
			01	1,330	1,004,693	244,846	980,689	50,984,105	53,214,334	13,753,100	66,967,433
--		Nicotine and salts	98	33	325,885	706	0	0	326,591	287,721	614,312
			99	37	286,702	586	0	0	287,288	759,322	1,046,610
			00	40	306,152	840	0	0	306,992	215,116	522,108
			01	35	437,274	950	0	215,914	654,138	284,733	938,871
1929-82-4	*	Nitrapyrin	98	3	1	0	0	0	1	0	1
			99	5	1	0	0	0	1	0	1
			00	6	1	0	0	0	1	0	1
			01	5	1	0	0	0	1	0	1
--		Nitrate compounds	98	1,717	376,963	221,465,000	53,125,133	12,251,510	287,218,606	11,016,996	298,235,602
			99	1,888	255,102	239,581,607	46,743,415	13,490,681	300,070,805	11,213,979	311,284,784
			00	1,966	337,285	238,407,195	57,203,694	13,116,005	309,064,179	10,161,428	319,225,607
			01	1,959	515,899	192,795,905	36,867,512	13,506,554	243,685,870	14,174,527	257,860,397
7697-37-2	*	Nitric acid	98	2,005	2,747,086	60,651	24,170,260	233,416	27,211,413	1,149,513	28,360,926
			99	1,955	2,791,187	60,181	22,810,609	273,558	25,935,535	8,070,369	34,005,904
			00	1,945	2,305,357	51,558	19,491,764	406,830	22,255,509	8,385,274	30,640,783
			01	1,847	1,804,386	86,022	13,177,641	452,403	15,520,452	3,682,415	19,202,867

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

	Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
*	Myclobutanil	98	0	0	0	0	0	794	243	1,037	0
		99	0	0	0	0	0	2,116	455	2,571	0
		00	0	0	0	0	0	2,602	86	2,688	0
		01	0	0	0	0	0	0	0	0	0
*	Nabam	98	0	0	192	0	7,352	0	4,864	12,408	0
		99	0	0	0	0	0	0	0	0	0
		00	0	0	0	0	0	0	0	0	0
		01	0	0	0	0	0	0	7,592	7,592	0
*	Naled	98	0	0	0	0	0	0	0	0	0
		99	0	0	0	0	0	0	0	0	0
		00	0	0	0	0	0	0	0	0	0
		01	0	0	0	0	1,124	0	6	1,130	0
*	Naphthalene	98	8,738,037	1,023,246	7,042,652	24,418,318	8,873,921	1,118,012	4,973,574	56,187,760	138,735
		99	14,208,353	1,106,053	74,518,363	3,231,854	9,068,977	816,077	3,750,745	106,700,422	43,123
		00	13,124,448	6,623,950	8,374,093	2,633,914	15,450,426	447,854	3,103,251	49,757,936	15,323
		01	6,907,847	8,243,628	16,521,044	15,458,947	7,385,166	466,623	2,594,940	57,578,195	33,328
**	alpha-Naphthyl-amine	98	0	0	0	0	0	0	0	0	0
		99	0	0	0	0	243,339	0	165	243,504	0
		00	0	0	0	0	191,684	800	5	192,489	0
		01	0	0	330	1,491	173,649	75	37	175,582	0
**	beta-Naphthyl-amine	98	0	0	0	0	0	0	0	0	0
		99	0	0	0	0	118,000	0	3	118,003	0
		00	0	0	0	0	112,279	740	6	113,025	0
		01	0	0	330	1,491	150,247	83	44	152,195	0
**	Nickel	98	38,440,954	84,485,333	38,720	1,899	327,510	550,080	13,712,972	137,557,469	10,591
		99	29,054,871	87,627,293	0	575	914,321	541,136	12,208,358	130,346,554	172,606
		00	41,211,781	86,480,252	106,100	24,816	1,696,016	398,013	9,850,692	139,767,669	14,307
		01	30,643,467	83,547,785	0	5	318,104	214,333	11,090,398	125,814,093	457,278
**	Nickel compounds	98	6,153,217	29,075,141	5,035	357	838,244	871,910	70,169,028	107,112,932	715,029
		99	7,169,903	31,190,172	2,900	27,128	691,587	901,091	63,702,159	103,684,940	5,648,507
		00	6,791,878	29,216,031	7,493	3,406	745,548	1,017,895	66,510,589	104,292,841	3,438,336
		01	5,337,174	24,673,257	5,482	3,040	615,586	349,802	67,199,326	98,183,667	1,182,707
	Nicotine and salts	98	0	7,611	0	0	976,855	645,409	621,919	2,251,794	8,449
		99	2,877	4,692	0	0	1,410,888	541,900	548,180	2,508,537	0
		00	2,662	39,198	0	3,000	1,370,252	549,964	520,278	2,485,354	0
		01	2,817	12,896	0	0	1,007,188	503,254	636,853	2,163,008	0
*	Nitrapyrin	98	0	0	0	0	0	140	1	141	0
		99	0	0	0	0	0	140	1	141	0
		00	0	0	0	0	0	534	1	535	0
		01	0	0	0	0	0	0	1	1	316
	Nitrate compounds	98	117,904,731	2,204,886	0	59,241	113,021,088	141,052,646	313,807,358	688,049,950	128,327
		99	98,650,089	1,875,622	0	55,902	123,363,927	141,649,130	337,793,619	703,388,289	563,997
		00	97,381,231	1,657,179	0	39,820	156,075,603	150,138,721	355,638,663	760,931,217	542,319
		01	83,215,827	786,458	0	71,975	166,171,227	178,880,408	272,004,175	701,130,070	846,635
*	Nitric acid	98	49,798,305	3,137,082	0	13,678	320,643,285	17,999,030	28,530,811	420,122,191	27,515
		99	49,505,705	2,822,384	14,434	0	344,600,379	15,672,639	34,343,072	446,958,613	4,566
		00	58,106,020	1,782,548	0	324	360,356,424	15,515,079	32,951,286	468,711,681	165,204
		01	64,955,578	1,947,737	0	3,383	309,588,845	13,266,297	21,919,421	411,681,261	500,036

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	On-site Releases: Surface Water Discharges Pounds	On-site Releases: Underground Injection Pounds	On-site Releases: Releases to Land Pounds	On-site Releases: Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
139-13-9	**	Nitrilotriacetic acid	98	15	1,407	10,202	2,400	11,617	25,626	0	25,626
			99	12	600	6,320	1,600	0	8,520	0	8,520
			00	11	651	8	2,200	0	2,859	0	2,859
			01	12	625	35	2,100	17,975	20,735	0	20,735
100-01-6		p-Nitroaniline	98	5	12,058	0	0	0	12,058	500	12,558
			99	5	11,977	0	0	7,644	19,621	4,119	23,740
			00	6	3,933	0	0	0	3,933	0	3,933
			01	7	2,557	0	0	9,959	12,516	4,850	17,366
99-59-2		5-Nitro-o-anisidine	98	1	10	5	0	0	15	0	15
			99	1	10	5	0	0	15	0	15
			00	1	10	5	0	0	15	0	15
			01	1	10	5	0	0	15	0	15
98-95-3	*,**	Nitrobenzene	98	27	81,297	1,152	422,619	62	505,130	12,383	517,513
			99	34	77,544	372	211,347	65	289,328	63,908	353,236
			00	30	41,934	120	297,084	18	339,156	6,721	345,877
			01	33	40,716	238	302,988	6,644	350,586	19,235	369,821
92-93-3	*,**	4-Nitrobiphenyl	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
1836-75-5	*,**	Nitrofen	98	No reports							
			99	No reports							
			00	1	505	0	0	0	505	5,500	6,005
			01	1	505	0	0	0	505	5,500	6,005
51-75-2	**	Nitrogen mustard	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
55-63-0		Nitroglycerin	98	22	12,814	4,713	0	0	17,527	266	17,793
			99	32	15,510	1	0	0	15,511	1,125	16,636
			00	29	154,372	1	0	0	154,373	2	154,375
			01	45	123,363	0	0	0	123,363	9	123,372
88-75-5		2-Nitrophenol	98	6	174	35	0	0	209	0	209
			99	6	52	48	0	0	100	0	100
			00	6	84	56	0	0	140	0	140
			01	6	37	123	0	0	160	505	665
100-02-7	*	4-Nitrophenol	98	8	890	0	0	0	890	500	1,390
			99	10	1,068	1	0	21,924	22,993	4,272	27,265
			00	8	1,219	16	0	0	1,235	5	1,240
			01	7	1,202	303	0	11,945	13,450	5,990	19,440
79-46-9	*,**	2-Nitropropane	98	9	23,838	558	0	0	24,396	192	24,588
			99	6	20,942	286	0	0	21,228	1,146	22,374
			00	7	18,970	229	0	0	19,199	1,157	20,356
			01	7	17,283	231	0	0	17,514	1,562	19,076
924-16-3	**	N-Nitrosodi-n-butylamine	98	1	0	0	0	0	0	0	0
			99	1	2	1	0	0	3	4	7
			00	2	5	0	0	0	5	10	15
			01	2	5	0	0	0	5	4,505	4,510

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR: not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
** Nitrilotriacetic acid	98	0	0	0	0	1,070,287	27,440	25,626	1,123,353	0
	99	0	0	0	0	727,119	142	8,520	735,781	0
	00	0	0	0	0	577,244	3,138	2,859	583,241	0
	01	0	0	0	0	370,000	3,726	20,735	394,461	0
p-Nitroaniline	98	0	0	0	0	28,500	169,427	12,403	210,330	0
	99	0	0	0	0	1,249	86,550	23,990	111,789	0
	00	9,570	0	32,495	85	0	9,411	3,933	55,494	0
	01	0	0	30,392	73	2,063	2,344	18,337	53,209	0
5-Nitro-o-anisidine	98	0	0	0	0	0	0	1	1	0
	99	0	0	0	0	0	0	1	1	0
	00	0	0	0	0	0	0	1	1	0
	01	0	0	0	0	0	0	1	1	0
*,**Nitrobenzene	98	419,863	0	1,847,505	1,254,122	2,521,686	1,056,242	514,694	7,614,112	7,023
	99	13,396,471	1	1,773,033	1,682,042	4,245,916	2,335,225	378,928	23,811,616	9,098
	00	796,670	0	2,727,811	866,548	1,962,685	1,552,466	338,377	8,244,557	763
	01	2,284,240	0	1,818,676	482,301	3,672,327	2,031,262	433,117	10,721,923	684
*,**4-Nitrobiphenyl	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
*,**Nitrofen	98	No reports								
	99	No reports								
	00	0	200	0	0	0	0	0	200	0
	01	0	200	0	0	0	0	0	200	0
** Nitrogen mustard	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
Nitroglycerin	98	18,000	15,198	0	21,685	270,572	134,991	20,617	481,063	0
	99	33,366	790	0	32,958	6,729,204	59,510	15,761	6,871,589	98
	00	6,967	0	0	27,266	1,886,871	72,328	156,002	2,149,434	540
	01	6,107	89,692	0	18,237	1,073,598	103,764	123,385	1,414,783	255
2-Nitrophenol	98	0	0	82,000	0	413,946	24,000	214	520,160	0
	99	0	0	65,000	0	324,516	18,545	101	408,162	0
	00	0	0	120,000	0	670,000	18,034	142	808,176	0
	01	0	0	98,000	0	186,095	12,406	316	296,817	0
* 4-Nitrophenol	98	0	0	0	591,228	170,944	633,084	1,040	1,396,296	0
	99	0	0	10,300	0	285,138	526,831	27,239	849,508	0
	00	0	0	0	0	282,248	68,535	1,212	351,995	0
	01	0	0	26,682	1,490	326,936	240	20,152	375,500	0
*,**2-Nitropropane	98	0	0	9,835	519,251	214,424	42,968	24,588	811,066	0
	99	0	0	90	0	893,670	65	22,345	916,170	0
	00	0	0	69	0	896,218	957	19,761	917,005	0
	01	0	0	458	1,124	781,943	134	18,424	802,083	0
** N-Nitrosodi-n-butylamine	98	0	0	0	0	0	0	0	0	0
	99	0	0	0	0	32,000	0	2	32,002	0
	00	0	0	0	0	45,069	959	8	46,036	0
	01	0	0	330	1,267	64,286	4,676	4,482	75,041	0

Note: Data from Section 8 (Current Year) of Form R

NR. not reportable (chemicals added to the TRI list after 1998)
No reports. No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	On-site Releases: Surface Water Discharges Pounds	On-site Releases: Underground Injection Pounds	On-site Releases: Releases to Land Pounds	On-site Releases: Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
55-18-5	**	N-Nitrosodiethylamine	98	2	2	0	0	0	2	0	2
			99	3	30	1	0	7,640	7,671	4,123	11,794
			00	3	5	0	0	0	5	10	15
			01	3	234	0	0	9,959	10,193	7,347	17,540
62-75-9	**	N-Nitrosodimethylamine	98	1	129	0	0	0	129	0	129
			99	1	5	0	0	0	5	0	5
			00	1	0	0	0	0	0	0	0
			01	No reports							
86-30-6		N-Nitrosodiphenylamine	98	5	75	0	0	0	75	0	75
			99	6	33	0	0	0	33	0	33
			00	6	49	0	0	0	49	0	49
			01	6	17	0	0	0	17	0	17
156-10-5		p-Nitrosodiphenylamine	98	2	24	0	0	0	24	0	24
			99	2	24	0	0	0	24	0	24
			00	2	0	0	0	0	0	0	0
			01	2	0	0	0	0	0	0	0
621-64-7	**	N-Nitrosodi-n-propylamine	98	2	879	0	0	0	879	1,500	2,379
			99	1	5	0	0	0	5	0	5
			00	3	2	0	0	0	2	0	2
			01	3	6	0	0	0	6	505	511
759-73-9	**	N-Nitroso-N-ethylurea	98	1	0	0	0	0	0	0	0
			99	3	7	1	0	0	8	161	169
			00	3	0	0	0	0	0	5	5
			01	2	0	0	0	0	0	255	255
684-93-5	*,**	N-Nitroso-N-methylurea	98	1	0	0	0	0	0	0	0
			99	3	7	1	0	0	8	162	170
			00	3	0	0	0	0	0	5	5
			01	2	0	0	0	0	0	260	260
4549-40-0	**	N-Nitrosomethylvinylamine	98	No reports							
			99	2	4	0	0	0	4	153	157
			00	1	0	0	0	0	0	0	0
			01	1	0	0	0	0	0	0	0
59-89-2	**	N-Nitrosomorpholine	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
16543-55-8	**	N-Nitrosonornicotine	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
100-75-4	**	N-Nitrosopiperidine	98	1	0	0	0	0	0	0	0
			99	3	38	1	0	9,557	9,596	5,159	14,755
			00	3	5	0	5	0	10	10	20
			01	2	286	0	0	12,453	12,739	6,565	19,304
99-55-8		5-Nitro-o-toluidine	98	3	0	0	0	0	0	0	0
			99	5	27	0	0	7,644	7,671	4,139	11,810
			00	5	0	0	0	0	0	5	5
			01	5	229	0	0	9,959	10,188	5,350	15,538

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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year.

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** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
** N-Nitrosodiethylamine	98	0	0	0	0	23,708	0	2	23,710	0
	99	0	0	0	0	54,242	0	11,791	66,033	0
	00	0	0	0	0	65,985	801	10	66,796	0
	01	0	0	0	0	60,297	7,383	23,392	91,072	0
** N-Nitrosodimethylamine	98	0	0	0	0	352,946	0	129	353,075	0
	99	0	0	0	0	3,978	40	1	4,019	0
	00	0	0	0	0	0	0	0	0	0
	01	No reports								
N-Nitrosodiphenylamine	98	0	0	0	340,000	158,471	34,298	75	532,844	0
	99	0	0	0	410,000	414,689	35,279	28	859,996	0
	00	0	0	45,500	490,000	379,039	20,662	47	935,248	0
	01	0	0	75,000	350,100	188,674	37,568	17	651,359	0
p-Nitrosodiphenylamine	98	0	0	9,300	16,500	0	0	24	25,824	0
	99	0	0	10,000	18,000	0	0	24	28,024	0
	00	0	0	9,100	16,200	0	0	0	25,300	0
	01	0	0	4,800	8,600	0	0	0	13,400	0
** N-Nitrosodi-n-propylamine	98	0	0	25,000	1,500	377,946	0	729	405,175	0
	99	0	0	0	0	3,605	36	1	3,642	0
	00	0	0	30,275	79	12,299	771	2	43,426	0
	01	0	0	28,647	1,402	61,326	73	441	91,889	0
** N-Nitroso-N-ethylurea	98	0	0	0	0	0	0	0	0	0
	99	0	0	0	0	161,322	0	164	161,486	0
	00	0	0	0	0	130,914	781	2	131,697	0
	01	0	0	0	0	98,088	1	13	98,102	0
*,**N-Nitroso-N-methylurea	98	0	0	0	0	0	0	0	0	0
	99	0	0	0	0	162,480	0	165	162,645	0
	00	0	0	0	0	133,534	789	1	134,324	0
	01	0	0	0	0	97,482	1	13	97,496	0
** N-Nitrosomethylvinylamine	98	No reports								
	99	0	0	0	0	94,353	0	157	94,510	0
	00	0	0	0	0	67,878	0	0	67,878	0
	01	0	0	0	0	38,475	0	0	38,475	0
** N-Nitrosomorpholine	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
** N-Nitrosonornicotine	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
** N-Nitrosopiperidine	98	0	0	0	0	0	0	0	0	0
	99	0	0	0	0	73,025	0	14,753	87,778	0
	00	0	0	0	0	68,660	752	12	69,424	0
	01	0	0	0	0	72,064	527	20,546	93,137	0
5-Nitro-o-toluidine	98	0	0	0	0	0	0	0	0	0
	99	0	0	0	0	71,394	0	11,808	83,202	0
	00	0	0	0	733	58,203	79	2	59,017	0
	01	0	0	0	0	72,580	527	16,536	89,643	0

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
27314-13-2	*	Norflurazon	98	4	15	76	0	229	320	14,850	15,170
			99	2	5	2	0	4	11	1,850	1,861
			00	3	0	0	0	0	0	14,462	14,462
			01	3	0	0	0	0	0	24,363	24,363
2234-13-1		Octachloro-naphthalene	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
29082-74-4	***	Octachlorostyrene	98	NR	NR	NR	NR	NR	NR	NR	NR
			99	NR	NR	NR	NR	NR	NR	NR	NR
			00	4	0.00	0.00	0.00	148.30	148.30	436.90	585.20
			01	4	0.00	0.12	0.00	193.00	193.12	508.60	701.72
19044-88-3	*	Oryzalin	98	4	103	0	0	0	103	0	103
			99	5	53	0	0	0	53	0	53
			00	4	24	0	0	0	24	0	24
			01	4	5	0	0	0	5	500	505
20816-12-0		Osmium tetroxide	98	No reports							
			99	1	0	0	0	0	0	0	0
			00	1	0	5	0	0	5	0	5
			01	1	0	5	0	0	5	0	5
301-12-2	*	Oxydemeton methyl	98	1	0	0	0	0	0	0	0
			99	1	0	0	0	0	0	0	0
			00	1	0	0	0	0	0	0	0
			01	1	0	0	0	0	0	0	0
19666-30-9	*	Oxydiazon	98	5	1,160	0	0	0	1,160	750	1,910
			99	6	770	0	0	0	770	2,207	2,977
			00	6	900	0	0	0	900	1,502	2,402
			01	5	835	0	0	0	835	0	835
42874-03-3	*	Oxyfluorfen	98	2	10	0	0	0	10	0	10
			99	3	1,305	0	0	17,690	18,995	0	18,995
			00	4	10	0	0	16,113	16,123	1,297	17,420
			01	2	10	0	0	0	10	3,500	3,510
10028-15-6		Ozone	98	38	657,048	0	0	0	657,048	0	657,048
			99	39	631,964	0	0	5	631,969	0	631,969
			00	46	842,039	0	0	0	842,039	0	842,039
			01	41	765,489	0	0	0	765,489	0	765,489
123-63-7		Paraldehyde	98	4	26	0	0	0	26	0	26
			99	6	54	72	0	0	126	268	394
			00	6	288	5	0	0	293	10	303
			01	7	31	5	0	0	36	760	796
1910-42-5	*	Paraquat dichloride	98	3	500	0	0	0	500	0	500
			99	3	0	0	0	0	0	0	0
			00	3	0	0	0	0	0	0	0
			01	4	1	0	0	66,000	66,001	0	66,001
56-38-2	*	Parathion	98	2	0	0	0	0	0	85	85
			99	3	0	0	0	0	0	28	28
			00	3	0	0	0	0	0	0	0
			01	3	2	0	0	0	2	620	622

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year NR· not reportable (chemicals added to the TRI list after 1998)

No reports. No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

*** PBT Chemical added to list for 2000 reporting year See Chapter 3 for more information

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
* Norflurazon	98	0	0	0	0	12,700	59,780	340	72,820	0
	99	0	0	0	0	0	46,850	15	46,865	0
	00	0	0	0	0	0	14,900	14,900	29,800	0
	01	0	0	0	0	0	505	24,868	25,373	0
Octachloro-naphthalene	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
*** Octachlorostyrene	98	NR	NR	NR	NR	NR	NR	NR	NR	NR
	99	NR	NR	NR	NR	NR	NR	NR	NR	NR
	00	0.00	0.00	0.00	0.00	19.00	0.00	585.20	604.20	0.00
	01	0.00	0.00	0.00	0.00	8.00	0.00	701.72	709.72	0.00
* Oryzalin	98	0	0	0	0	22,972	42,000	98	65,070	0
	99	0	0	0	0	19,518	67,000	48	86,566	0
	00	0	0	0	11,000	0	33	24	11,057	0
	01	0	0	0	0	40,962	0	210	41,172	0
Osmium tetroxide	98	No reports								
	99	0	0	0	0	37,606	0	0	37,606	0
	00	0	0	0	0	47,912	0	9	47,921	0
	01	0	0	0	0	28,340	0	0	28,340	0
* Oxydemeton methyl	98	0	0	0	0	0	0	0	0	0
	99	0	0	0	0	0	0	0	0	0
	00	0	0	0	0	0	0	0	0	0
	01	0	0	0	0	0	0	0	0	0
* Oxydiazon	98	28,500	0	0	0	960	287	900	30,647	0
	99	31,000	0	0	0	1,000	4,092	4,641	40,733	0
	00	36,300	0	0	0	780	440	5,393	42,913	0
	01	2,760	0	0	0	910	66	760	4,496	0
* Oxyfluorfen	98	0	0	0	0	2,800	2,900	1	5,701	0
	99	0	0	0	0	1,300	15,599	17,692	34,591	0
	00	0	0	0	0	1,800	14,411	16,115	32,326	0
	01	0	0	0	0	1,840	13,043	2	14,885	0
Ozone	98	0	0	0	0	2,918,204	0	655,954	3,574,158	0
	99	0	0	0	0	2,629,193	0	662,836	3,292,029	0
	00	0	0	0	0	3,155,398	0	873,392	4,028,790	0
	01	0	0	0	0	2,797,687	0	764,678	3,562,365	0
Paraldehyde	98	0	0	18,414	7	140,002	0	26	158,449	0
	99	0	0	43,482	0	409,965	8	391	453,846	0
	00	0	0	26,172	5	414,255	862	57	441,351	0
	01	0	0	29,640	1,494	375,674	77	162	407,047	0
* Paraquat dichloride	98	0	0	0	0	0	6	112	118	0
	99	0	0	0	0	0	10	0	10	0
	00	0	0	0	0	0	10	0	10	0
	01	0	0	0	0	0	10	66,000	66,010	0
* Parathion	98	0	0	0	0	32,638	0	85	32,723	0
	99	0	0	0	0	69,806	0	28	69,834	0
	00	0	0	0	0	64,761	36	0	64,797	0
	01	0	0	0	1,258	82,292	1,022	2	84,574	0

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports. No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

*** PBT Chemical added to list for 2000 reporting year See Chapter 3 for more information

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	On-site Releases: Surface Water Discharges Pounds	On-site Releases: Underground Injection Pounds	On-site Releases: Releases to Land Pounds	On-site Releases: Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
1114-71-2	*	Pebulate	98	2	520	98	0	0	618	1,501	2,119
			99	1	500	0	0	0	500	500	1,000
			00	1	500	0	0	0	500	500	1,000
			01	1	0	0	0	0	0	0	0
40487-42-1	*	Pendimethalin	98	9	3,003	15	0	5	3,023	683	3,706
			99	11	2,468	40	0	5	2,513	5,762	8,275
		Not comparable	00	18	733.54	329.00	0.00	20,675.00	21,737.54	9,555.00	31,292.54
		to prior years***	01	18	3,573.66	195 00	0.00	29,017.00	32,785.66	46,702.21	79,487.87
608-93-5	****	Pentachloro-	98	NR	NR	NR	NR	NR	NR	NR	NR
		benzene	99	NR	NR	NR	NR	NR	NR	NR	NR
			00	20	162.54	173.85	11.90	2,622.80	2,971.09	355.00	3,326.09
			01	17	69.10	132.70	1.48	2,349.90	2,553.18	206.32	2,759.50
76-01-7	*	Pentachloroethane	98	10	1,610	0	0	0	1,610	0	1,610
			99	10	808	2	0	0	810	244	1,054
			00	11	1,352	0	0	0	1,352	512	1,864
			01	11	669	4	0	519	1,192	2,459	3,651
87-86-5	*,**	Pentachlorophenol	98	44	4,630	1,307	250	240,250	246,437	25,058	271,495
			99	48	1,306	1,277	5	98,837	101,425	2,381	103,806
			00	45	471	1,206	250	25	1,952	1,961	3,913
			01	38	459	1,335	5	24	1,823	2,872	4,695
57-33-0		Pentobarbital	98	1	0	0	0	0	0	0	0
		sodium	99	No reports							
			00	No reports							
			01	1	28	0	0	0	28	0	28
79-21-0	*	Peracetic acid	98	26	8,330	5	0	1,150	9,485	0	9,485
			99	27	13,557	755	0	1,095	15,407	0	15,407
			00	31	8,677	5	0	1,036	9,718	5	9,723
			01	27	7,254	5	0	877	8,136	8	8,144
594-42-3	*	Perchloromethyl	98	3	894	0	0	0	894	0	894
		mercaptan	99	3	899	0	0	0	899	0	899
			00	3	820	0	0	0	820	0	820
			01	3	667	0	0	0	667	0	667
52645-53-1	*	Permethrin	98	19	4,435	7	0	0	4,442	17,549	21,991
			99	22	2,593	0	0	31,000	33,593	1,013	34,606
			00	21	1,581	7	0	0	1,588	1,000	2,588
			01	22	1,372	0	0	0	1,372	1,000	2,372
85-01-8		Phenanthrene	98	84	265,280	216	0	77,577	343,073	80,865	423,938
			99	97	262,631	174	0	74,813	337,618	118,360	455,978
			00	103	119,998	878	0	15,913	136,789	28,915	165,704
			01	109	69,125	934	0	4,460	74,519	74,625	149,144
108-95-2	*	Phenol	98	822	9,012,783	61,661	1,921,347	503,654	11,499,445	1,246,969	12,746,414
			99	803	7,485,780	45,961	1,843,177	1,438,729	10,813,647	1,312,520	12,126,167
			00	789	7,512,640	46,839	2,469,354	216,260	10,245,093	1,047,719	11,292,812
			01	732	6,750,142	47,188	1,349,277	179,837	8,326,444	1,286,712	9,613,156
26002-80-2	*	Phenothrin	98	2	0	0	0	0	0	0	0
			99	3	0	0	0	0	0	0	0
			00	3	10	0	0	0	10	0	10
			01	3	10	0	0	0	10	0	10

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year NR· not reportable (chemicals added to the TRI list after 1998)

No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information).

*** Data for PBT chemicals, due to threshold change for 2000 reporting year, are not comparable to prior year reporting See Chapter 3 for more information

**** PBT Chemical added to list for 2000 reporting year See Chapter 3 for more information

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
* Pebulate	98	0	0	0	0	89	2,809	1,523	4,421	0
	99	0	0	0	0	0	0	680	680	0
	00	0	0	0	0	0	0	600	600	0
	01	0	0	0	0	0	0	0	0	0
* Pendimethalin	98	2,000	0	0	0	246,483	104,946	2,658	356,087	0
	99	6,000	0	0	0	182,171	64,385	4,670	257,226	0
Not comparable	00	4,000.00	0.00	0.00	0.00	656,145.00	19,602.00	31,358.55	711,105.55	0.00
to prior years***	01	6,000.00	0.00	0.00	0.00	390,997.29	34,656.00	71,546.00	503,199.29	0.00
****Pentachloro-	98	NR	NR	NR	NR	NR	NR	NR	NR	NR
benzene	99	NR	NR	NR	NR	NR	NR	NR	NR	NR
	00	40.00	401.00	0.00	0.00	342,267.00	1,390.81	3,324.28	347,423.09	2.35
	01	8.00	770.00	330.00	1,491.00	445,846.25	1,307.52	2,759.93	452,512.70	3,073.84
* Pentachloroethane	98	620,000	0	0	134,821	5,054,747	107,405	1,611	5,918,584	0
	99	670,000	16,407	0	0	5,849,325	43,357	980	6,580,069	168
	00	340,000	5,796	617,910	0	15,373,974	62,072	1,922	16,401,674	8,700
	01	545,255	0	430,786	0	8,054,885	53,431	3,564	9,087,921	48,000
*,** Pentachlorophenol	98	76,838	227,808	2,682	4,416	109,941	127,933	268,037	817,655	5,813
	99	19,440	4,773	41,837	2,928	329,450	155,002	113,742	667,172	3,760
	00	10,766	13,933	66,872	4,078	280,750	69,743	3,017	449,159	6,285
	01	3,215	280,960	23,695	5,979	225,515	56,242	3,727	599,333	5,210
Pentobarbital	98	0	0	0	0	0	0	0	0	0
sodium	99	No reports								
	00	No reports								
	01	9,726	0	0	6,507	0	0	28	16,261	0
* Peracetic acid	98	0	0	0	0	47,536	17,732	9,971	75,239	0
	99	0	0	0	0	20,329	5,860	27,481	53,670	0
	00	0	0	0	0	107,738	20,424	25,186	153,348	100
	01	0	0	0	0	93,078	44,622	19,243	156,943	0
* Perchloromethyl	98	0	0	0	0	120,000	15	891	120,906	0
mercaptan	99	0	0	0	0	112,000	8	898	112,906	0
	00	0	0	0	0	156,000	6	820	156,826	0
	01	0	0	0	0	113,000	5	666	113,671	0
* Permethrin	98	0	0	0	0	10,815	22,529	5,379	38,723	0
	99	0	0	0	0	26,248	17,999	35,618	79,865	0
	00	0	0	0	0	14,147	22,937	1,672	38,756	0
	01	1,900	0	0	0	45,790	12,931	1,493	62,114	0
Phenanthrene	98	658,266	98,267	53,336	199,055	761,416	170,624	368,905	2,309,869	7,312
	99	986,986	83,569	10,620	250,220	391,091	112,071	470,389	2,304,946	10
	00	830,954	534,880	101,300	140,531	972,018	142,200	162,160	2,884,043	10
	01	818,894	742,926	74,575	89,675	205,256	36,390	153,392	2,121,108	1,513
* Phenol	98	42,421,575	164,242	32,544,546	9,287,496	31,115,699	5,263,833	12,409,386	133,206,777	49,058
	99	41,867,407	593,078	30,396,093	4,073,634	30,640,935	6,394,000	10,860,463	124,825,610	7,038
	00	58,250,338	1,025,878	23,271,768	7,653,198	31,248,592	5,937,139	11,467,821	138,854,734	1,860
	01	46,844,797	306,172	24,967,736	12,727,862	28,671,895	5,169,844	9,307,015	127,995,321	18,305
* Phenothrin	98	0	0	0	0	0	0	0	0	0
	99	0	0	0	0	0	0	0	0	0
	00	0	0	0	0	0	5,031	20	5,051	0
	01	0	0	0	0	0	19,497	20	19,517	0

Note: Data from Section 8 (Current Year) of Form R

NR. not reportable (chemicals added to the TRI list after 1998)

No reports: No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

*** Data for PBT chemicals, due to threshold change for 2000 reporting year, are not comparable to prior year reporting. See Chapter 3 for more information

**** PBT Chemical added to list for 2000 reporting year See Chapter 3 for more information

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
95-54-5		1,2-Phenylene-diamine	98	9	565	51	0	0	616	1,641	2,257
			99	8	518	30	0	4,033	4,581	7	4,588
			00	9	548	118	0	3,497	4,163	0	4,163
			01	9	584	68	0	10	662	0	662
108-45-2		1,3-Phenylene-diamine	98	25	8,915	722	0	18,668	28,305	20,559	48,864
			99	21	2,358	237	0	31,534	34,129	37	34,166
			00	22	3,093	179	0	38,980	42,252	2,138	44,390
			01	19	4,332	535	0	77	4,944	6,500	11,444
106-50-3		p-Phenylene-diamine	98	12	1,517	114	0	0	1,631	1,816	3,447
			99	11	1,781	184	0	1,100	3,065	2,978	6,043
			00	11	9,051	93	10	954	10,108	2,566	12,674
			01	10	5,483	272	0	3	5,758	1,500	7,258
615-28-1		1,2-Phenylene-diamine dihydrochloride	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
624-18-0		1,4-Phenylene-diamine dihydrochloride	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
90-43-7	*	2-Phenylphenol	98	15	23	20	0	250	293	1,363	1,656
			99	20	14	10	0	253	277	1,755	2,032
			00	17	260	10	0	0	270	1,552	1,822
			01	12	4	0	0	0	4	1,511	1,515
57-41-0	**	Phenytoin	98	2	4	0	0	0	4	7,653	7,657
			99	1	1	0	0	0	1	9,400	9,401
			00	1	255	0	0	0	255	12,600	12,855
			01	1	255	0	0	0	255	9,377	9,632
75-44-5		Phosgene	98	35	20,247	0	0	3	20,250	0	20,250
			99	35	16,676	0	0	0	16,676	93	16,769
			00	31	15,950	250	0	0	16,200	0	16,200
			01	30	16,133	250	0	0	16,383	0	16,383
7803-51-2	*	Phosphine	98	5	38,368	0	0	0	38,368	0	38,368
			99	8	54,388	0	0	0	54,388	92	54,480
			00	6	85,227	0	0	0	85,227	0	85,227
			01	6	21,377	0	0	0	21,377	0	21,377
7723-14-0	*	Phosphorus (yellow or white)	98	54	23,604	3,761	0	2,273,118	2,300,483	8,205	2,308,688
			99	55	85,123	4,995	0	2,715,468	2,805,586	6,847	2,812,433
			00	48	2,919	3,584	0	979,338	985,841	11,912	997,753
			01	60	55,718	3,137	0	583,654	642,509	13,344	655,853
85-44-9		Phthalic anhydride	98	169	303,624	193	31,039	0	334,856	3,828,154	4,163,010
			99	160	277,065	68	0	7,940	285,073	2,961,063	3,246,136
			00	166	244,069	250	5	81,509	325,833	3,247,093	3,572,926
			01	159	254,605	0	755	321,927	577,287	1,033,101	1,610,388
1918-02-1	*	Picloram	98	2	460	380,006	0	0	380,466	0	380,466
			99	2	2,800	133,010	0	0	135,810	0	135,810
			00	2	2,388	150,500	0	9,000	161,888	0	161,888
			01	2	2,361	230,782	0	0	233,143	0	233,143

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

			Recycled		Energy Recovery		Treated				
	Chemical	Year	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
	1,2-Phenylene-diamine	98	0	0	0	0	176,437	50,690	2,245	229,372	0
		99	0	0	0	0	178,620	47,156	4,588	230,364	0
		00	0	0	182,587	0	181,524	48,077	4,163	416,351	0
		01	0	0	124,402	0	153,497	55,750	661	334,310	1
	1,3-Phenylene-diamine	98	650	114,558	0	2,300	687,041	1,734,329	46,426	2,585,304	1,520
		99	760	0	0	2,901	276,300	1,730,750	35,231	2,045,942	0
		00	290	0	0	3,052	336,809	1,285,245	40,239	1,665,635	0
		01	55	6,500	102,300	1,341	223,983	1,202,098	4,439	1,540,716	0
	p-Phenylene-diamine	98	0	0	0	111	337,520	66,661	3,045	407,337	0
		99	0	0	0	8	413,800	104,497	4,093	522,398	0
		00	0	0	508,635	93	188,231	30,873	11,299	739,131	0
		01	0	0	356,849	490	139,299	16,253	8,902	521,793	0
	1,2-Phenylene-diamine dihydrochloride	98	No reports								
		99	No reports								
		00	No reports								
		01	No reports								
	1,4-Phenylene-diamine dihydrochloride	98	No reports								
		99	No reports								
		00	No reports								
		01	No reports								
*	2-Phenylphenol	98	197	0	300	0	120,000	332	456	121,285	0
		99	0	0	1	0	125,000	2,970	313	128,284	0
		00	0	0	1	0	6,300	2,574	922	9,797	0
		01	0	0	1	0	2,700	3,101	1,245	7,047	0
**	Phenytoin	98	0	0	0	0	20,769	15,000	7,646	43,415	0
		99	0	0	0	0	152	17,500	9,400	27,052	0
		00	0	0	0	0	130	4,300	12,600	17,030	0
		01	0	0	0	0	130	0	9,377	9,507	0
	Phosgene	98	3,173,304	0	0	330	7,417,425	735	20,288	10,612,082	43
		99	10,150,418	0	0	0	11,452,168	543	16,535	21,619,664	33
		00	6,180,000	0	0	0	12,525,890	4,580	17,356	18,727,826	31
		01	6,623,410	0	0	1	9,853,934	600	15,497	16,493,442	10
*	Phosphine	98	0	0	0	0	328,000	0	38,368	366,368	135
		99	0	0	0	0	439,337	0	54,480	493,817	0
		00	0	0	0	0	347,207	0	85,217	432,424	0
		01	0	0	0	0	202,430	100	21,367	223,897	0
*	Phosphorus (yellow or white)	98	1	236,289	0	0	981,152	1,235	2,307,523	3,526,200	4,400
		99	75,122	202,852	0	0	603,616	2,671	2,737,029	3,621,290	1
		00	0	92,946	0	0	1,221,607	1,090	992,028	2,307,671	0
		01	0	68,645	0	0	725,641	42,478	650,234	1,486,998	0
	Phthalic anhydride	98	169,533	49,603	3,110,037	2,988,761	16,780,832	560,162	4,160,317	27,819,245	15,046
		99	79,831	29,939	2,993,912	1,904,147	15,894,165	154,329	3,214,709	24,271,032	72,444
		00	141,428	85,316	2,881,508	1,228,275	13,626,851	590,233	2,963,562	21,517,173	3,090
		01	2,769,496	42,309	3,665,164	1,046,242	14,089,007	278,305	1,911,493	23,802,016	31,620
*	Picloram	98	0	0	0	0	59,000	0	380,006	439,006	0
		99	0	0	0	0	51,940	280,000	136,010	467,950	0
		00	0	0	0	0	48,470	340,000	160,508	548,978	0
		01	0	0	0	0	88,345	531,625	233,142	853,112	0

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
88-89-1		Picric acid	98	8	0	1	96,222	0	96,223	0	96,223
			99	8	0	1	129,398	0	129,399	0	129,399
			00	9	0	274	106,784	0	107,058	0	107,058
			01	7	459	24	76,521	0	77,004	0	77,004
51-03-6	*	Piperonyl butoxide	98	12	501	0	0	0	501	0	501
			99	13	1,005	0	0	0	1,005	0	1,005
			00	13	1,001	144	0	0	1,145	0	1,145
			01	13	2	0	0	0	2	0	2
29232-93-7	*	Pirimiphos methyl	98	No reports							
			99	1	1	0	0	0	1	0	1
			00	1	5	0	0	0	5	0	5
			01	No reports							
--	**	Polybrominated biphenyls	98	2	0	0	0	0	0	0	0
			99	2	0	0	0	0	0	0	0
			00	No reports							
			01	No reports							
--	**	Polychlorinated alkanes	98	72	4,085	4,131	0	0	8,216	111,132	119,348
			99	70	5,788	4,805	0	16,065	26,658	120,756	147,414
			00	66	6,839	5,706	0	0	12,545	112,199	124,744
			01	60	479,191	4	0	0	479,195	88,956	568,151
1336-36-3	*,**	Polychlorinated biphenyls (PCBs)	98	21	446	251	5	3,742,136	3,742,838	4,327	3,747,165
			99	23	531	2	0	10,164,476	10,165,009	1,641	10,166,650
		Not comparable	00	162	1,158.00	28.82	0.60	1,431,738.80	1,432,926.22	10,205.60	1,443,131.82
		to prior years***	01	137	1,359.90	2.80	0.00	2,491,162.15	2,492,524.85	12,251.02	2,504,775.86
--	**	Polycyclic aromatic compounds	98	278	1,438,600	2,008	0	286,591	1,727,199	1,755,172	3,482,371
			99	302	1,374,564	1,844	0	205,500	1,581,908	2,154,590	3,736,498
		Not comparable	00	2,257	1,474,310.19	17,576.02	0.00	292,180.36	1,784,066.57	3,011,595.37	4,795,661.94
		to prior years***	01	2,304	1,146,126.02	16,384.58	332.40	159,816.95	1,322,659.96	1,536,544.27	2,859,204.23
7758-01-2	**	Potassium bromate	98	4	10	0	0	0	10	0	10
			99	2	5	0	0	0	5	0	5
			00	3	505	0	0	0	505	750	1,255
			01	3	250	0	0	0	250	250	500
128-03-0	*	Potassium dimethyldithiocarbamate	98	19	533	43,088	0	5	43,626	5	43,631
			99	20	10,523	25,567	0	5	36,095	676	36,771
			00	14	16,792	10,394	0	0	27,186	0	27,186
			01	12	13,740	5,617	0	0	19,357	0	19,357
137-41-7	*	Potassium N-methyldithiocarbamate	98	5	0	0	0	0	0	0	0
			99	5	10	5,680	0	0	5,690	0	5,690
			00	4	5	5	0	0	10	23,377	23,387
			01	6	5	5	0	0	10	20,915	20,925
41198-08-7	*	Profenofos	98	1	10	0	0	0	10	0	10
			99	1	10	0	0	0	10	0	10
			00	No reports							
			01	1	0	0	0	0	0	0	0
7287-19-6	*	Prometryn	98	5	725	8	0	0	733	1,047	1,780
			99	5	502	4	0	0	506	0	506
			00	4	533	0	0	0	533	0	533
			01	5	613	0	0	0	613	0	613

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year NR not reportable (chemicals added to the TRI list after 1998)

No reports No reports received for the chemical in that reporting year.

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information). For polycyclic aromatic compounds, applies to all polycyclic aromatic compounds reported except benzo(a)phenanthrene, dibenzo(a,e)fluoranthene, benzo(j,k)fluorene, and 3-methylcholanthrene

*** Data for PBT chemicals, due to threshold change for 2000 reporting year, are not comparable to prior year reporting See Chapter 3 for more information

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

			Recycled		Energy Recovery		Treated				
	Chemical	Year	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
	Picric acid	98	0	0	129,412	12,941	1,627,444	0	96,223	1,866,020	0
		99	0	0	582	0	1,582,234	0	129,399	1,712,215	0
		00	0	0	13,597	3	2,132,561	0	107,058	2,253,219	0
		01	0	0	536	0	1,999,965	0	77,004	2,077,505	0
*	Piperonyl butoxide	98	0	0	0	0	0	3,412	426	3,838	0
		99	0	0	0	0	21,382	3,432	595	25,409	0
		00	0	0	0	0	21,362	11,802	712	33,876	0
		01	0	0	0	0	13,307	2,490	1	15,798	0
*	Pirimiphos methyl	98	No reports								
		99	0	0	0	0	0	0	1	1	0
		00	0	0	0	0	0	0	1	1	0
		01	No reports								
**	Polybrominated biphenyls	98	0	1,000	0	0	0	0	0	1,000	0
		99	0	448	0	0	0	0	0	448	0
		00	No reports								
		01	No reports								
**	Polychlorinated alkanes	98	110,100	510,315	32,400	89,093	47,526	233,344	146,565	1,169,343	628
		99	127,200	461,513	28,000	94,229	30,188	227,335	163,823	1,132,288	0
		00	120,000	319,454	0	79,109	48,428	242,967	123,016	932,974	0
		01	100,000	163,260	660	113,873	87,112	209,886	654,112	1,328,903	851
*,**	Polychlorinated biphenyls (PCBs)	98	0	140,018	0	0	8,446,718	690,092	3,626,637	12,903,465	1
		99	0	92,003	0	0	11,690,585	1,032,750	6,629,574	19,444,912	111
	Not comparable	00	358.00	611.65	1,410.77	10,517.00	11,906,010.11	415,163.21	1,483,299.33	13,817,370.07	22,247.24
	to prior years***	01	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
**	Polycyclic aromatic compounds	98	1,992,127	306,050	3,808,404	270,675	2,336,671	40,610	3,375,480	12,130,017	44,045
		99	3,465,916	221,154	4,100,254	101,838	2,418,779	66,470	3,871,152	14,245,563	131,987
	Not comparable	00	2,550,191.40	615,679.71	8,482,044.65	206,941.18	10,541,963.60	256,107.34	4,929,605.13	27,582,533.01	64,121.72
	to prior years***	01	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
**	Potassium bromate	98	0	0	51,447	1	0	0	13	51,461	0
		99	0	0	0	0	0	0	10	10	0
		00	0	0	0	0	0	0	1,060	1,060	0
		01	0	0	0	0	0	0	250	250	300
*	Potassium dimethyldithiocarbamate	98	0	0	0	0	23,596	120,325	54,888	198,809	0
		99	0	0	0	0	42,919	72,363	52,819	168,101	0
		00	0	0	0	0	8,504	57,251	27,186	92,941	0
		01	0	0	0	0	4,596	46,048	19,357	70,001	0
*	Potassium N-methyldithiocarbamate	98	0	0	0	0	0	0	0	0	0
		99	0	0	0	0	4,647	0	5,690	10,337	0
		00	0	0	0	0	0	0	30,000	30,000	0
		01	0	0	0	0	0	0	27,000	27,000	0
*	Profenofos	98	0	0	0	0	0	0	7,270	7,270	0
		99	0	0	0	0	0	0	6,420	6,420	0
		00	No reports								
		01	0	0	0	0	0	0	0	0	0
*	Prometryn	98	0	0	0	0	30,035	38,455	789	69,279	0
		99	0	0	0	0	51,018	6,238	4,342	61,598	0
		00	0	0	0	0	10,007	21,250	21,776	53,033	0
		01	0	0	0	0	17,007	4,587	602	22,196	0

Note: Data from Section 8 (Current Year) of Form R

NR. not reportable (chemicals added to the TRI list after 1998)

No reports. No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information). For polycyclic aromatic compounds, applies to all polycyclic aromatic compounds reported except benzo(a)phenanthrene, dibenzo(a,e)fluoranthene, benzo(j,k)fluorene, and 3-methylcholanthrene.

*** Data for PBT chemicals, due to threshold change for 2000 reporting year, are not comparable to prior year reporting See Chapter 3 for more information

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	On-site Releases: Surface Water Discharges Pounds	On-site Releases: Underground Injection Pounds	On-site Releases: Releases to Land Pounds	On-site Releases: Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
23950-58-5	*	Pronamide	98	4	365	0	0	0	365	0	365
			99	3	332	1	0	0	333	16	349
			00	4	170	0	0	0	170	255	425
			01	3	0	0	0	0	0	505	505
1918-16-7	*	Propachlor	98	4	62	0	0	0	62	600	662
			99	4	81	0	0	14,208	14,289	10	14,299
			00	3	3	0	0	0	3	120	123
			01	2	240	1	0	0	241	0	241
1120-71-4	**	Propane sultone	98	No reports							
			99	2	5	0	5	0	10	157	167
			00	2	1	0	0	0	1	0	1
			01	3	250	0	0	0	250	505	755
709-98-8	*	Propanil	98	6	2,507	750	0	0	3,257	11,520	14,777
			99	5	2,010	750	0	0	2,760	26,250	29,010
			00	5	521	250	0	0	771	28,500	29,271
			01	6	1,024	250	0	0	1,274	48,300	49,574
2312-35-8	*	Propargite	98	3	525	0	0	0	525	3,546	4,071
			99	3	739	0	0	0	739	9,446	10,185
			00	3	551	0	0	0	551	1,140	1,691
			01	3	626	0	0	0	626	86	712
107-19-7	*	Propargyl alcohol	98	16	15,680	0	418,223	7,620	441,523	253	441,776
			99	15	9,974	0	545,399	0	555,373	10,237	565,610
			00	11	3,803	0	1,031,538	0	1,035,341	26,096	1,061,437
			01	14	2,947	0	747,137	0	750,084	1,361	751,445
31218-83-4	*	Propetamphos	98	1	10	0	0	0	10	250	260
			99	1	10	0	0	0	10	250	260
			00	1	10	0	0	0	10	750	760
			01	No reports							
60207-90-1	*	Propiconazole	98	5	10	0	0	0	10	0	10
			99	3	10	0	0	0	10	0	10
			00	3	0	0	0	0	0	0	0
			01	4	0	0	0	0	0	0	0
57-57-8	*,**	beta-Propiolactone	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
123-38-6	*	Propionaldehyde	98	29	311,345	6,017	92,183	78	409,623	14	409,637
			99	27	426,122	2,604	112,720	0	541,446	331	541,777
			00	35	304,533	10,878	91,235	2,277	408,923	450	409,373
			01	31	390,637	2,733	40,662	0	434,032	135	434,167
114-26-1	*	Propoxur	98	3	0	0	0	0	0	10	10
			99	2	11	0	0	0	11	10	21
			00	2	5	0	0	0	5	0	5
			01	3	10	0	0	0	10	500	510
115-07-1		Propylene	98	416	16,640,924	3,104	2,870	389	16,647,287	897	16,648,184
			99	439	13,693,999	1,023	136,393	396	13,831,811	118	13,831,929
			00	436	13,102,280	3,246	27,664	5	13,133,195	18	13,133,213
			01	427	13,924,267	1,594	24,081	56,474	14,006,416	56,448	14,062,864

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
* Pronamide	98	5,500	0	0	234,265	0	2,095	400	242,260	0
	99	14,000	0	0	0	33,000	2,393	1,628	51,021	0
	00	11,000	0	0	0	47,591	2,089	1,064	61,744	0
	01	0	0	330	320	62,063	671	396	63,780	0
* Propachlor	98	0	0	0	0	0	91,800	662	92,462	0
	99	0	0	0	0	77,027	85,700	14,884	177,611	0
	00	0	0	0	0	13,747	900	123	14,770	0
	01	4,500	0	0	0	4,900	3,200	240	12,840	0
** Propane sultone	98	No reports								
	99	0	0	0	0	129,321	0	165	129,486	0
	00	0	0	0	0	103,051	772	1	103,824	0
	01	0	0	0	0	111,063	0	443	111,506	0
* Propanil	98	200,000	0	0	0	202,192	86,745	12,824	501,761	50
	99	0	0	0	0	0	270,452	3,357	273,809	50
	00	0	0	0	0	33,794	400,428	1,696	435,918	110
	01	143	0	0	200	0	50,166	448	50,957	25
* Propargite	98	0	0	0	2,216	0	76,189	3,896	82,301	0
	99	0	0	0	4,164	255	13,305	564	18,288	0
	00	0	0	0	3,240	255	10,397	376	14,268	0
	01	13	0	0	4,144	255	6,967	451	11,830	0
* Propargyl alcohol	98	0	0	60,400	521,236	122,320	42,800	444,547	1,191,303	1
	99	0	0	13,091	4	232,624	62,376	592,052	900,147	5
	00	32	0	0	0	67,989	44,757	1,101,028	1,213,806	0
	01	28	0	0	13	41,151	64,533	770,814	876,539	1,050
* Propetamphos	98	0	0	0	0	0	0	482	482	0
	99	0	0	0	0	0	0	490	490	0
	00	0	0	0	0	0	0	495	495	0
	01	No reports								
* Propiconazole	98	0	0	0	0	25,000	0	2,943	27,943	0
	99	0	0	0	0	22,000	0	2,001	24,001	0
	00	0	0	0	0	15,000	0	0	15,000	0
	01	0	0	0	0	20,000	0	0	20,000	0
*,**beta-Propiolactone	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
* Propionaldehyde	98	0	0	2,021,614	447,257	5,082,156	46,298	411,557	8,008,882	402
	99	440,000	0	2,311,283	6,506	3,030,989	34,933	534,575	6,358,286	0
	00	0	0	4,639,054	5,080	30,329,356	1,767	411,188	35,386,445	18
	01	223,807	521	2,810,395	83,441	6,120,483	171,083	386,314	9,796,044	18
* Propoxur	98	0	0	0	0	0	435	25	460	0
	99	0	0	0	0	56,411	0	11	56,422	0
	00	0	0	0	0	0	39	1	40	0
	01	0	0	0	0	28,231	1,281	67	29,579	0
Propylene	98	72,765,807	23,152	455,991,665	2,218	307,027,993	2,896,808	15,270,441	853,978,084	1,239,979
	99	104,322,899	28	338,452,763	10,337,809	393,639,467	1,579,785	13,575,570	861,908,321	267,570
	00	131,973,657	45	338,105,929	71	515,897,929	437,870	13,022,059	999,437,560	323,283
	01	25,694,779	25	282,717,411	85,357	461,181,800	14,093,926	13,793,661	797,566,959	203,649

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports. No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	On-site Releases: Surface Water Discharges Pounds	On-site Releases: Underground Injection Pounds	On-site Releases: Releases to Land Pounds	On-site Releases: Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
75-55-8	**	Propyleneimine	98	4	385	5	0	0	390	5	395
			99	6	108	0	0	0	108	153	261
			00	4	89	0	0	0	89	0	89
			01	4	574	5	0	0	579	5	584
75-56-9	*,**	Propylene oxide	98	122	740,059	1,124	15,303	691	757,177	5,687	762,864
			99	127	705,052	10,847	15,071	29,364	760,334	5,266	765,600
			00	122	460,257	11,652	2,100	115,232	589,241	6,829	596,070
			01	115	304,054	452	6,399	66,745	377,650	10,271	387,921
110-86-1	*	Pyridine	98	66	70,959	1,056	593,204	0	665,219	16,146	681,365
			99	66	69,660	1,075	953,995	0	1,024,730	53,300	1,078,030
			00	59	83,417	1,930	959,200	5	1,044,552	36,839	1,081,391
			01	59	71,294	428	770,268	8,284	850,274	8,136	858,410
91-22-5		Quinoline	98	22	15,416	32	29,350	265	45,063	2,626	47,689
			99	19	11,813	26	25,205	7	37,051	21,715	58,766
			00	18	22,026	21	31,413	11	53,471	3,233	56,704
			01	20	4,781	18	24,899	6	29,704	6,060	35,764
106-51-4	*	Quinone	98	8	482	1,600	0	0	2,082	0	2,082
			99	10	439	1,401	0	0	1,840	161	2,001
			00	9	569	1,400	0	0	1,969	135	2,104
			01	8	470	1,051	0	0	1,521	747	2,268
82-68-8	*	Quintozene	98	13	1,798	0	0	0	1,798	2	1,800
			99	17	422	1	0	0	423	5,022	5,445
			00	19	1,928	0	0	0	1,928	8,435	10,363
			01	17	1,213	1	0	589	1,803	7,914	9,717
76578-14-8	*	Quizalofop-ethyl	98	1	0	0	0	0	0	0	0
			99	1	0	0	0	0	0	0	0
			00	1	0	0	0	0	0	0	0
			01	1	0	0	0	0	0	0	0
10453-86-8	*	Resmethrin	98	2	0	0	0	0	0	0	0
			99	3	22	0	0	0	22	0	22
			00	3	0	0	0	0	0	0	0
			01	2	0	0	0	0	0	0	0
81-07-2		Saccharin (manufacturing)	98	2	160	0	0	0	160	940	1,100
			99	3	63	0	0	0	63	940	1,003
			00	2	80	0	0	0	80	100	180
			01	1	69	0	0	0	69	0	69
94-59-7	*,**	Safrole	98	3	10	0	0	0	10	0	10
			99	4	281	0	0	6,005	6,286	3,239	9,525
			00	4	260	0	0	0	260	0	260
			01	4	435	0	0	7,821	8,256	4,309	12,565
7782-49-2	*	Selenium	98	25	34,835	58	17,937	256,269	309,099	201,701	510,800
			99	24	69,802	285	0	267,917	338,004	12,040	350,044
			00	25	65,481	1,019	40,246	155,516	262,262	3,724	265,986
			01	24	88,194	3,261	0	3,024,113	3,115,568	1,249,298	4,364,866
--		Selenium compounds	98	132	602,482	36,100	38,038	5,169,845	5,846,465	446,298	6,292,763
			99	123	590,567	45,066	33,509	6,427,166	7,096,308	652,798	7,749,106
			00	121	576,929	56,378	27,699	7,209,823	7,870,829	1,757,925	9,628,754
			01	132	491,944	50,859	39,734	4,788,664	5,371,201	459,255	5,830,456

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998).
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
** Propyleneimine	98	0	0	0	0	2,788	6	680	3,474	0
	99	0	0	0	0	111,173	0	261	111,434	0
	00	0	0	0	0	58,472	0	90	58,562	0
	01	0	0	0	0	34,004	0	154	34,158	0
*,** Propylene oxide	98	1,081,157	0	13,924,312	97,882	14,444,921	475,463	767,488	30,791,223	1,411
	99	508,380	619	12,895,870	18,761	12,306,352	200,238	769,520	26,699,740	1,254
	00	508,380	0	14,595,273	29,398	191,619,914	179,584	588,555	207,521,104	11,256
	01	672,485	35	23,079,849	57,000	9,183,157	388,810	403,939	33,785,275	3,803
* Pyridine	98	616,015	1,600	1,772,791	1,090,271	2,098,536	748,228	692,092	7,019,533	1,109
	99	915,235	8,115	989,780	639,663	2,596,555	1,049,738	1,023,706	7,222,792	1,011
	00	590,646	10,457	815,513	352,570	3,131,610	725,729	1,044,365	6,670,890	8
	01	361,170	123,299	965,327	1,046,655	2,938,897	290,354	858,405	6,584,107	110
Quinoline	98	27,147	1,713	38	11,582	120,111	961	47,815	209,367	300
	99	12,831	1,137	28,056	11,353	135,341	4,200	58,429	251,347	0
	00	8,046	0	28,000	3,649	149,410	18,962	56,296	264,363	0
	01	2,919	10,585	8	2,808	222,221	1,101	35,582	275,224	0
* Quinone	98	0	0	1,400	17,747	567,300	10,917	2,101	599,465	0
	99	0	0	340	162,544	292,006	135,984	1,987	592,861	0
	00	0	0	340	124,080	244,773	165,714	1,867	536,774	0
	01	0	0	589	371	653,199	408,120	2,029	1,064,308	0
* Quintozene	98	515	0	0	342,800	44,515	13,168	1,793	402,791	0
	99	2,371	0	0	214,728	126,058	8,126	472	351,755	30
	00	2,299	0	0	558,653	114,121	7,141	10,387	692,601	0
	01	2,365	0	0	205,982	168,467	281,197	8,927	666,938	10
* Quizalofop-ethyl	98	0	0	0	0	0	0	0	0	0
	99	0	0	0	0	0	0	0	0	0
	00	0	0	0	0	0	0	0	0	0
	01	0	0	0	0	0	0	0	0	0
* Resmethrin	98	0	0	0	0	0	0	0	0	0
	99	0	0	0	0	0	46	0	46	0
	00	0	0	0	0	0	50	0	50	0
	01	0	0	0	0	0	344	0	344	0
Saccharin (manufacturing)	98	0	0	0	0	7,300	7	1,100	8,407	0
	99	0	0	0	0	124,730	7	1,000	125,737	0
	00	0	0	0	0	2,800	3	174	2,977	3
	01	0	0	0	0	2,100	2	69	2,171	0
*,** Safrole	98	0	0	0	0	0	10	30	40	0
	99	0	0	0	0	61,981	10	9,373	71,364	0
	00	0	0	0	0	58,686	810	126	59,622	0
	01	0	0	330	1,440	91,254	613	13,213	106,850	0
* Selenium	98	0	0	86,174	3,902	156	186,424	318,360	595,016	0
	99	4	800	0	0	1,166	50	347,555	349,575	47
	00	4,254	19,210	0	0	498	1,109	263,490	288,561	106
	01	3,784	800	0	50	0	0	4,368,816	4,373,450	0
Selenium compounds	98	651,027	69,641	0	0	2,044	9,766	6,262,710	6,995,188	76,443
	99	631,195	34,866	0	0	2,410	10,363	7,059,414	7,738,248	779,656
	00	625,209	34,429	0	0	0	85,497	8,979,528	9,724,663	319,000
	01	756,656	22,357	0	0	327	1,167	5,794,349	6,574,856	66,049

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports: No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
74051-80-2	*	Sethoxydim	98	3	10	0	0	0	10	0	10
			99	2	10	0	0	0	10	0	10
			00	3	3	0	0	0	3	0	3
			01	3	0	0	0	0	0	0	0
7440-22-4	*	Silver	98	102	11,864	171	15,382	402,332	429,749	104,883	534,632
			99	98	12,194	96	17,000	222,756	252,046	337,605	589,651
			00	89	10,147	105	19,000	48,014	77,266	8,046	85,312
			01	87	8,307	184	18,000	226,700	253,191	44,373	297,564
--		Silver compounds	98	84	7,640	6,385	140,109	4,168,109	4,322,243	357,677	4,679,920
			99	83	10,054	7,543	160,222	3,581,251	3,759,070	72,549	3,831,619
			00	79	11,392	6,728	170,214	4,066,283	4,254,617	327,853	4,582,470
			01	73	9,899	4,460	97,076	1,458,634	1,570,069	127,090	1,697,159
122-34-9	*	Simazine	98	7	3,321	332	0	0	3,653	4,497	8,150
			99	6	3,928	385	0	0	4,313	2,385	6,698
			00	6	2,974	367	0	8	3,349	3,418	6,767
			01	4	2,771	322	0	0	3,093	1,214	4,307
26628-22-8	*	Sodium azide	98	14	15,406	20	0	190,896	206,322	11,071	217,393
			99	12	5,957	15	0	33,542	39,514	5,970	45,484
			00	14	3,902	17	0	34,720	38,639	6,157	44,796
			01	10	2,461	21	0	35,308	37,790	103,475	141,265
1982-69-0	*	Sodium dicamba	98	2	8,560	0	750	0	9,310	0	9,310
			99	2	5,150	0	250	0	5,400	0	5,400
			00	5	7,102	0	250	0	7,352	500	7,852
			01	5	10,051	0	250	0	10,301	0	10,301
128-04-1	*	Sodium dimethyl-dithiocarbamate	98	94	12,261	4,868	0	337,651	354,780	318,752	673,532
			99	83	6,138	4	0	420,623	426,765	309,655	736,420
			00	77	7,114	4	0	171,133	178,251	748,151	926,402
			01	71	2,228	4	0	41,060	43,292	106,073	149,365
62-74-8	*	Sodium fluoro-acetate	98	No reports							
			99	2	4	0	0	0	4	153	157
			00	1	0	0	0	0	0	0	0
			01	1	0	0	0	0	0	0	0
7632-00-0	*	Sodium nitrite	98	442	173,865	1,031,134	1,969,201	548,905	3,723,105	478,300	4,201,405
			99	439	155,925	1,593,212	2,007,410	279,429	4,035,976	413,146	4,449,122
			00	439	132,935	1,158,926	2,276,276	365,649	3,933,786	407,386	4,341,172
			01	432	116,939	2,116,870	2,156,573	414,341	4,804,723	576,520	5,381,243
131-52-2	*	Sodium penta-chlorophenate	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
132-27-4	*,**	Sodium o-phenyl-phenoxide	98	4	0	0	0	0	0	0	0
			99	6	10	0	11,000	250	11,260	250	11,510
			00	9	10	750	13,000	250	14,010	1,750	15,760
			01	6	0	0	0	0	0	0	0
--		Strychnine and salts	98	1	0	0	0	0	0	0	0
			99	3	5	0	0	0	5	171	176
			00	2	0	0	0	0	0	0	0
			01	3	0	0	0	0	0	260	260

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

	Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
*	Sethoxydim	98	0	0	0	0	17,391	293	20	17,704	0
		99	0	0	0	0	0	0	20	20	0
		00	0	0	0	0	0	965	3	968	0
		01	0	0	0	0	0	2	0	2	0
*	Silver	98	649,013	1,346,794	0	32	4,917	44,975	651,244	2,696,975	1,138
		99	420,072	3,046,647	0	11	87	183,485	262,977	3,913,279	867
		00	479,965	1,134,943	0	0	822	745	133,782	1,750,256	108
		01	262,985	1,945,206	0	0	1	710	304,674	2,513,576	33
	Silver compounds	98	266,630	1,012,252	0	0	52,854	15,458	4,840,387	6,187,581	4,277
		99	3,876,852	1,141,972	0	0	2,090	13,643	3,471,585	8,506,142	549,121
		00	1,509,450	968,777	0	0	2,708	35,951	4,340,462	6,857,348	261,704
		01	630,072	1,121,853	0	0	540	959	2,546,141	4,299,565	94,864
*	Simazine	98	50	0	0	0	68,000	1,500	6,294	75,844	0
		99	50	0	0	0	77,000	8,251	14,154	99,455	0
		00	50	0	0	0	63,000	288	6,375	69,713	0
		01	50	0	0	0	62,000	0	3,675	65,725	0
*	Sodium azide	98	34,600	440,942	0	0	47,806	590,062	237,127	1,350,537	5
		99	15,800	148,200	0	0	172,830	297,907	45,503	680,240	3
		00	26,800	74,500	0	0	376,687	255,276	38,970	772,233	0
		01	13,921	36,131	0	0	219,927	144,435	155,146	569,560	0
*	Sodium dicamba	98	0	0	0	0	414,800	46,680	9,546	471,026	0
		99	0	0	0	0	248,383	0	5,400	253,783	0
		00	0	0	0	0	133,000	7,000	7,760	147,760	0
		01	0	0	0	0	186,130	4,600	10,001	200,731	0
*	Sodium dimethyl-dithiocarbamate	98	250	183,222	192	3	751,668	683,771	629,617	2,248,723	0
		99	250	196,401	0	0	830,308	590,553	613,649	2,231,161	0
		00	250	158,844	0	0	577,920	609,891	725,393	2,072,298	0
		01	200	90,182	0	0	747,885	614,439	113,224	1,565,930	0
*	Sodium fluoro-acetate	98	No reports								
		99	0	0	0	0	124,717	0	157	124,874	0
		00	0	0	0	0	89,038	0	0	89,038	0
		01	0	0	0	0	52,255	0	0	52,255	0
*	Sodium nitrite	98	434,389	17,741	0	17	39,605,102	3,499,708	5,660,426	49,217,383	9,037
		99	511,277	45,498	0	20	48,354,287	2,902,548	6,213,601	58,027,231	89,000
		00	632,150	205,247	211	3,832	46,622,464	2,734,030	4,441,374	54,639,308	140,087
		01	115,138	64,829	0	35	49,611,465	2,295,396	5,559,140	57,646,003	257
*	Sodium penta-chlorophenate	98	No reports								
		99	No reports								
		00	No reports								
		01	No reports								
*,**	Sodium o-phenyl-phenoxide	98	0	0	0	0	0	0	0	0	0
		99	0	0	0	0	0	0	11,000	11,000	0
		00	0	0	0	0	8,800	8,800	25,600	43,200	0
		01	0	0	0	0	0	0	0	0	0
	Strychnine and salts	98	0	0	0	0	31,974	0	0	31,974	0
		99	0	0	0	0	161,966	0	177	162,143	0
		00	0	0	0	0	120,960	20	0	120,980	0
		01	0	0	0	0	95,616	0	273	95,889	0

Note: Data from Section 8 (Current Year) of Form R

NR: not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
100-42-5	**	Styrene	98	1,690	54,845,503	243,148	507,683	337,312	55,933,646	2,106,111	58,039,757
			99	1,694	59,089,925	3,690	191,124	461,479	59,746,218	2,239,513	61,985,731
			00	1,723	58,427,654	3,371	260,005	279,068	58,970,098	2,210,727	61,180,825
			01	1,626	46,466,141	2,993	394,001	165,220	47,028,355	1,953,117	48,981,473
96-09-3	**	Styrene oxide	98	2	9	0	0	0	9	0	9
			99	1	7	0	0	0	7	0	7
			00	5	48	0	0	33,987	34,035	0	34,035
			01	3	6	0	0	0	6	0	6
7664-93-9	*	Sulfuric acid	98	1,333	195,977,178	22,609	690,900	141,338	196,832,025	367,593	197,199,618
			99	1,287	181,685,838	13,432	1,075,050	220,781	182,995,101	119,589	183,114,690
			00	1,221	149,584,936	18,311	807,650	95,238	150,506,135	272,771	150,778,906
			01	1,164	146,397,844	694	679,045	548,775	147,626,358	129,606	147,755,964
2699-79-8	*	Sulfuryl fluoride	98	3	466,000	0	0	0	466,000	0	466,000
			99	3	519,400	0	0	0	519,400	0	519,400
			00	3	629,500	0	0	0	629,500	0	629,500
			01	2	210,000	0	0	0	210,000	0	210,000
35400-43-2	*	Sulprofos	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
34014-18-1	*	Tebuthiuron	98	1	10	0	0	0	10	750	760
			99	1	755	0	0	0	755	750	1,505
			00	2	1,010	0	0	0	1,010	1,500	2,510
			01	2	10	0	0	0	10	500	510
3383-96-8	*	Temephos	98	3	7	0	0	0	7	0	7
			99	2	0	0	0	0	0	0	0
			00	2	0	0	0	0	0	0	0
			01	2	0	0	0	0	0	0	0
5902-51-2	*	Terbacil	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
79-94-7	***	Tetrabromo-bisphenol A	98	NR	NR	NR	NR	NR	NR	NR	NR
			99	NR	NR	NR	NR	NR	NR	NR	NR
			00	49	59,910.21	10.00	0.00	197,214.00	257,134.21	537,549.30	794,683.51
			01	48	54,004.91	9.00	0.00	196,675.00	250,688.91	625,481.75	876,170.66
630-20-6		1,1,1,2-Tetra-chloroethane	98	12	9,564	5	0	0	9,569	69	9,638
			99	14	5,387	1	0	0	5,388	735	6,123
			00	17	5,110	0	0	0	5,110	510	5,620
			01	14	3,604	91	0	54	3,749	505	4,254
79-34-5	*	1,1,2,2-Tetra-chloroethane	98	21	7,299	269	5	0	7,573	6,503	14,076
			99	18	5,202	1	0	15	5,218	30	5,248
			00	19	4,461	13	5	0	4,479	631	5,110
			01	18	3,456	56	0	961	4,473	941	5,414
127-18-4	*,**	Tetrachloro-ethylene	98	528	5,709,344	1,741	6,560	21,978	5,739,623	161,078	5,900,701
			99	467	4,025,978	1,794	9,185	104,885	4,141,842	204,511	4,346,353
			00	440	3,531,926	1,159	60,391	14,359	3,607,835	43,801	3,651,636
			01	382	2,674,561	556	111,606	23,082	2,809,805	55,641	2,865,446

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year. NR not reportable (chemicals added to the TRI list after 1998)

No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

*** PBT Chemical added to list for 2000 reporting year See Chapter 3 for more information

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
** Styrene	98	15,589,255	1,994,591	29,679,770	11,438,145	11,233,799	5,136,639	57,556,734	132,628,933	182,696
	99	14,357,718	931,048	43,228,207	12,095,378	14,583,686	4,097,267	65,519,340	154,812,644	161,727
	00	6,843,547	2,596,958	33,078,631	12,791,786	23,859,891	3,515,842	58,282,671	140,969,326	35,219
	01	3,941,728	2,408,379	29,330,338	9,962,105	17,770,782	3,451,702	47,877,132	114,742,166	168,003
** Styrene oxide	98	0	0	30,000	0	0	0	9	30,009	0
	99	0	0	70,000	0	0	0	7	70,007	0
	00	0	0	77,439	12,000	0	0	34,035	123,474	9
	01	0	0	82,629	4	0	0	6	82,639	0
* Sulfuric acid	98	32,489,671	1,193,481	43,000	17,225	544,983,911	4,590,153	195,948,310	779,265,751	43,865
	99	32,121,629	1,014,529	28,000	1,680	566,129,259	2,196,108	183,467,734	784,958,939	41,238
	00	58,243,766	2,441,697	4,725	3,469	607,863,890	2,577,157	151,368,314	822,503,018	64,275
	01	38,353,227	640,324	6,225	34,500	395,096,005	991,808	148,183,112	583,305,201	256,304
* Sulfuryl fluoride	98	0	0	0	0	0	0	461,000	461,000	5,700
	99	0	0	0	0	0	0	519,400	519,400	0
	00	0	0	0	0	0	0	629,500	629,500	0
	01	0	0	0	0	0	0	210,000	210,000	0
* Sulprofos	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
* Tebuthiuron	98	4	0	0	0	860	870	1	1,735	0
	99	3	0	0	0	680	700	1	1,384	0
	00	4	0	0	0	920	1,430	501	2,855	0
	01	4	0	0	0	880	890	1	1,775	0
* Temephos	98	0	0	0	0	31,269	0	7	31,276	0
	99	0	0	0	0	51,378	0	0	51,378	0
	00	0	0	0	0	51,378	0	0	51,378	0
	01	0	0	0	0	25,289	0	0	25,289	0
* Terbacil	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
*** Tetrabromo-bisphenol A	98	NR	NR	NR	NR	NR	NR	NR	NR	NR
	99	NR	NR	NR	NR	NR	NR	NR	NR	NR
	00	565.00	0.00	0.00	1,848.80	6,962.00	7,958.40	785,073.41	802,407.61	0.00
	01	556.00	323.00	0.00	2,927.50	94,850.00	52,090.00	854,019.81	1,004,766.31	0.00
1,1,1,2-Tetra-chloroethane	98	6,600,180	0	0	120,700	3,088,343	2,623,242	9,550	12,442,015	18
	99	6,500,000	0	0	147,754	4,730,670	63,047	5,424	11,446,895	385
	00	6,000,000	6,880	0	10,727	3,100,435	61,509	5,833	9,185,384	1,761
	01	7,930,998	0	0	170	4,962,090	74,476	3,805	12,971,539	4,650
* 1,1,2,2-Tetra-chloroethane	98	6,692,000	2,339,618	597,000	2,214	10,733,341	2,679,730	8,972	23,052,875	803
	99	6,492,000	3,095,391	0	0	12,363,611	53,056	4,799	22,008,857	294
	00	5,202,000	337,790	1,079,075	171	17,549,013	87,415	5,145	24,260,609	10,143
	01	7,141,061	30,170	1,168,289	0	12,162,041	233,996	5,176	20,740,733	22,003
*,** Tetrachloro-ethylene	98	133,625,941	16,582,245	3,641,921	3,490,168	26,714,562	5,708,583	5,756,105	195,519,525	36,377
	99	121,500,914	10,117,266	3,141,592	5,165,194	14,622,285	7,057,837	4,181,665	165,786,753	30,606
	00	110,995,826	8,628,400	3,083,463	3,454,935	216,713,360	2,775,764	3,961,228	349,612,976	31,486
	01	96,362,760	7,031,743	3,192,452	2,378,890	15,248,987	2,497,090	2,952,426	129,664,349	60,016

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

*** PBT Chemical added to list for 2000 reporting year See Chapter 3 for more information

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
354-11-0		1,1,1,2-Tetra-chloro-2-fluoro-ethane	98	1	23,275	1	0	0	23,276	0	23,276
			99	No reports							
			00	2	27,200	0	0	0	27,200	0	27,200
			01	No reports							
354-14-3		1,1,2,2-Tetra-chloro-1-fluoro-ethane	98	1	10	0	0	0	10	0	10
			99	1	10	0	0	0	10	0	10
			00	1	25	0	0	0	25	0	25
			01	1	25	0	0	0	25	0	25
961-11-5	*	Tetrachlorvinphos	98	4	360	5	0	0	365	0	365
			99	6	201	5	0	0	206	1,846	2,052
			00	6	444	5	0	0	449	37	486
			01	4	318	5	0	0	323	1,850	2,173
64-75-5	*	Tetracycline hydrochloride	98	2	525	0	0	0	525	1,800	2,325
			99	4	0	0	0	0	0	4,300	4,300
			00	5	10	0	0	0	10	11,550	11,560
			01	4	10	0	0	0	10	2,400	2,410
7696-12-0	*	Tetramethrin	98	2	0	0	0	0	0	0	0
			99	4	10,080	0	0	0	10,080	0	10,080
			00	3	11,088	0	0	0	11,088	0	11,088
			01	3	12,600	0	0	0	12,600	0	12,600
7440-28-0		Thallium	98	9	268	5	0	91,739	92,012	3,670	95,682
			99	7	3,157	600	0	77,055	80,812	103,578	184,390
			00	7	1,104	540	0	256	1,900	102,714	104,614
			01	5	64	0	0	119,537	119,601	808	120,409
--		Thallium compounds	98	32	35,565	999	0	11,165,608	11,202,172	2,561	11,204,733
			99	35	5,456	2,879	0	3,362,057	3,370,392	61,645	3,432,037
			00	39	11,800	2,095	0	3,839,249	3,853,144	1,070,698	4,923,842
			01	42	6,140	11,605	0	3,697,138	3,714,883	61,452	3,776,335
148-79-8	*	Thiabendazole	98	3	0	0	0	0	0	0	0
			99	3	255	0	0	0	255	0	255
			00	3	500	0	0	0	500	1,500	2,000
			01	4	500	0	0	0	500	1,500	2,000
62-55-5	**	Thioacetamide	98	1	0	0	0	0	0	0	0
			99	3	7	1	0	0	8	164	172
			00	3	5	0	0	0	5	5	10
			01	3	4	0	0	0	4	260	264
28249-77-6	*	Thiobencarb	98	2	286	0	0	0	286	760	1,046
			99	2	343	0	0	0	343	832	1,175
			00	2	34	0	0	0	34	11	45
			01	2	15	0	0	0	15	5,036	5,051
139-65-1	**	4,4'-Thiodianiline	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
59669-26-0	*	Thiodicarb	98	3	359	0	0	0	359	5,966	6,325
			99	3	438	0	0	6,843	7,281	239	7,520
			00	4	355	0	0	0	355	0	355
			01	4	613	0	0	0	613	0	613

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

			Recycled		Energy Recovery		Treated				
	Chemical	Year	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
	1,1,1,2-Tetrachloro-2-fluoroethane	98	6,600	270	0	0	0	0	21,000	27,870	0
		99	No reports								
		00	7,800	0	0	0	0	550	27,200	35,550	0
		01	No reports								
	1,1,2,2-Tetrachloro-1-fluoroethane	98	0	0	0	0	0	26,387	15	26,402	0
		99	0	0	0	0	0	67,130	15	67,145	0
		00	0	0	0	30,589	0	7,306	25	37,920	0
		01	0	0	0	6,221	0	25,952	25	32,198	0
*	Tetrachlorvinphos	98	350	0	44,000	26,700	870	11,640	211	83,771	0
		99	375	0	14,000	98,900	37,641	13,640	496	165,052	0
		00	370	0	21,000	34,600	63,913	23,990	330	144,203	0
		01	380	0	0	0	40,532	10,635	434	51,981	0
*	Tetracycline hydrochloride	98	0	0	0	0	0	700	2,160	2,860	0
		99	0	0	0	0	0	2,001	4,501	6,502	0
		00	0	0	0	0	0	4,888	11,588	16,476	1
		01	0	0	0	0	0	1,500	2,488	3,988	0
*	Tetramethrin	98	0	0	0	0	0	0	0	0	0
		99	0	0	0	0	0	260	10,080	10,340	0
		00	0	0	0	0	0	0	11,088	11,088	0
		01	0	0	0	0	0	0	12,600	12,600	0
	Thallium	98	0	0	52,353	1	21,600	10	91,792	165,756	0
		99	9	0	0	0	0	51	179,437	179,497	0
		00	1,400	0	0	0	0	29	103,732	105,161	0
		01	0	1,400	0	0	0	0	120,387	121,787	0
	Thallium compounds	98	2,133	0	0	0	0	251	11,104,136	11,106,520	100,650
		99	1,884	0	0	0	0	315	3,204,554	3,206,753	180,000
		00	221,810	8,705	0	0	0	29	4,493,787	4,724,331	58,300
		01	76,604	5,800	0	0	0	0	3,772,800	3,855,204	16,605
*	Thiabendazole	98	0	0	0	0	0	747	0	747	0
		99	0	0	0	0	1,500	5,094	75	6,669	0
		00	0	0	0	0	1,600	5,045	240	6,885	0
		01	0	0	0	0	1,600	4,331	240	6,171	0
**	Thioacetamide	98	0	0	0	0	0	0	0	0	0
		99	0	0	0	0	181,229	0	167	181,396	0
		00	0	0	0	0	138,216	787	6	139,009	0
		01	0	0	330	1,511	121,257	46	18	123,162	0
*	Thiobencarb	98	747	0	0	0	0	198	1,772	2,717	0
		99	0	0	0	0	0	105	120	225	0
		00	6	0	0	0	0	11	34	51	0
		01	0	0	0	0	0	5	5,051	5,056	5,049
**	4,4'-Thiodianiline	98	No reports								
		99	No reports								
		00	No reports								
		01	No reports								
*	Thiodicarb	98	108,880	0	0	0	34,243	19,476	362	162,961	0
		99	84,500	0	0	0	35,246	11,073	1,200	132,019	0
		00	156,750	0	0	0	49,529	12,706	1,653	220,638	0
		01	75,000	0	0	0	44,656	22,532	611	142,799	0

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
23564-06-9	*	Thiophanate ethyl	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
23564-05-8	*	Thiophanate methyl	98	7	431	0	0	0	431	442	873
			99	10	493	0	0	0	493	7,165	7,658
			00	10	740	0	0	0	740	3,709	4,449
			01	11	0	0	0	0	0	1,601	1,601
79-19-6		Thiosemi-carbazide	98	No reports							
			99	2	3	0	0	0	3	98	101
			00	1	0	0	0	0	0	0	0
			01	1	0	0	0	0	0	0	0
62-56-6	*,**	Thiourea	98	31	1,422	358	1,250	250	3,280	5,895	9,175
			99	29	1,002	258	0	250	1,510	1,297	2,807
			00	30	1,533	266	0	28,803	30,602	956	31,558
			01	24	1,565	296	11,000	31,285	44,146	309	44,455
137-26-8	*	Thiram	98	69	3,443	22	0	1,751	5,216	87,190	92,406
			99	66	3,416	31	0	589	4,036	71,461	75,497
			00	71	3,938	40	0	9,873	13,851	741,007	754,858
			01	68	2,816	35	0	7,206	10,057	84,446	94,503
1314-20-1		Thorium dioxide	98	2	0	0	0	0	0	0	0
			99	1	0	0	0	0	0	0	0
			00	1	0	0	0	0	0	0	0
			01	1	0	0	0	0	0	0	0
7550-45-0		Titanium tetrachloride	98	37	37,991	0	0	0	37,991	380	38,371
			99	34	28,212	0	0	0	28,212	260,390	288,602
			00	38	31,351	0	0	41	31,392	239,867	271,259
			01	37	36,879	0	0	23	36,902	61,939	98,841
108-88-3	*	Toluene	98	3,888	99,308,613	43,786	724,015	94,368	100,170,782	1,688,492	101,859,274
			99	3,656	91,194,604	44,624	728,385	312,110	92,279,723	2,056,115	94,335,838
			00	3,548	81,538,847	40,511	513,810	148,703	82,241,871	1,477,494	83,719,365
			01	3,321	71,539,704	75,909	265,130	127,657	72,008,400	1,780,473	73,788,873
584-84-9	**	Toluene-2,4-diisocyanate	98	61	6,851	5	0	0	6,856	4,402	11,258
			99	63	4,842	6	0	14,201	19,049	14,973	34,022
			00	63	3,602	5	0	12,160	15,767	15,040	30,807
			01	54	10,611	894	0	0	11,505	15,688	27,193
91-08-7	**	Toluene-2,6-diisocyanate	98	26	1,560	0	0	0	1,560	1,079	2,639
			99	30	4,330	0	0	0	4,330	1,418	5,748
			00	27	447	0	0	0	447	3,670	4,117
			01	25	1,664	62	0	0	1,726	3,731	5,457
26471-62-5	**	Toluene diisocyanate (mixed isomers)	98	180	55,406	0	0	534	55,940	32,450	88,390
			99	183	34,832	2,501	0	256	37,589	36,070	73,659
			00	179	35,405	2,500	0	29,739	67,644	18,655	86,299
			01	172	29,808	0	0	18,273	48,081	72,396	120,477
95-53-4	**	o-Toluidine	98	19	7,750	5	17,020	5	24,780	11	24,791
			99	25	7,736	2	10,010	0	17,748	635	18,383
			00	25	11,069	25	7,040	0	18,134	400	18,534
			01	23	9,784	26	12,020	10	21,840	633	22,473

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
* Thiophanate ethyl	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
* Thiophanate methyl	98	10,000	0	0	0	0	3,431	436	13,867	0
	99	11,800	0	0	0	0	13,725	2,810	28,335	0
	00	470	0	0	0	0	5,781	5,126	11,377	0
	01	0	0	0	0	0	3,852	1,601	5,453	0
Thiosemi-carbazide	98	No reports								
	99	0	0	0	0	67,904	0	101	68,005	0
	00	0	0	0	0	49,589	0	0	49,589	0
	01	0	0	0	0	24,302	0	0	24,302	0
*,** Thiourea	98	0	245	0	0	54,525	16,111	8,822	79,703	0
	99	0	0	0	0	382,504	6,349	2,591	391,444	0
	00	0	55,452	0	0	216,817	20,797	31,140	324,206	13,000
	01	0	57	0	240	301,047	8,377	44,024	353,745	0
* Thiram	98	25,341	31,339	0	870	42,192	19,988	90,484	210,214	0
	99	34,797	32,328	0	925	261,724	25,452	75,059	430,285	0
	00	33,951	21,459	0	1,022	190,731	23,605	82,964	353,732	0
	01	23,583	26,934	330	2,021	232,895	17,069	85,235	388,067	1,500
Thorium dioxide	98	3,100	0	0	0	0	0	330	3,430	0
	99	0	0	0	0	0	0	0	0	0
	00	0	0	0	0	27,000	0	0	27,000	0
	01	0	0	0	0	0	0	0	0	0
Titanium tetrachloride	98	0	196,905	0	1	31,168,125	142,054	38,619	31,545,704	265
	99	0	176,544	0	1	31,288,986	268,223	29,724	31,763,478	31
	00	0	148,838	0	0	31,809,842	245,617	30,966	32,235,263	544
	01	13,063,436	70,077	0	0	31,599,053	137,004	36,410	44,905,980	42
* Toluene	98	1,094,203,086	27,903,590	239,098,487	153,895,277	266,201,113	34,858,953	104,496,350	1,920,656,856	973,205
	99	1,019,788,626	26,533,460	226,838,615	158,385,184	285,830,043	35,338,928	93,217,602	1,845,932,458	631,533
	00	1,082,002,596	27,689,852	214,745,364	163,493,289	339,848,300	26,914,690	85,307,277	1,940,001,368	313,500
	01	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
** Toluene-2,4-diisocyanate	98	393	440	1,410	9,586	21,916	23,162	9,700	66,607	689
	99	80	0	0	24,734	1,315,146	44,080	22,882	1,406,922	14
	00	15,650	3,000	0	7,762	875,494	26,500	43,271	971,677	20
	01	12,732	1,900	0	6,989	632,791	4,293	33,867	692,572	0
** Toluene-2,6-diisocyanate	98	98	0	0	1,276	501	2,613	1,546	6,034	0
	99	220	0	0	48	215,867	8,890	5,341	230,366	0
	00	0	750	0	1,538	87,801	4,363	3,096	97,548	0
	01	0	480	0	252	53,741	2,336	7,371	64,180	81
** Toluene diisocyanate (mixed isomers)	98	7,260	1,996	7,812,428	2,054,250	1,218,761	299,050	71,320	11,465,065	17,912
	99	13,350	438	5,076,288	67,400	4,586,866	182,771	44,322	9,971,435	18,373
	00	4,048	1,126	3,337,852	32,266	32,648,003	665,361	79,828	36,768,484	3,118
	01	751	0	17,222,925	81,418	3,266,299	140,693	118,789	20,830,875	10,722
** o-Toluidine	98	220	198	303,180	120,352	150,729	105,606	24,800	705,085	461
	99	0	0	1,953,207	515,283	757,634	57,511	18,328	3,301,963	5,132
	00	0	0	592,030	206,023	582,720	170,605	22,563	1,573,941	1
	01	0	0	674,677	41,451	416,509	79,985	21,917	1,234,539	0

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	On-site Releases: Surface Water Discharges Pounds	On-site Releases: Underground Injection Pounds	On-site Releases: Releases to Land Pounds	On-site Releases: Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
636-21-5	**	o-Toluidine hydrochloride	98	1	0	0	0	0	0	0	0
			99	3	10	1	0	0	11	164	175
			00	3	250	0	0	0	250	5	255
			01	3	5	0	0	0	5	260	265
8001-35-2	*,**	Toxaphene	98	5	13	0	0	25,476	25,489	113	25,602
			99	4	16	1	0	0	17	14	31
		Not comparable	00	15	20.98	1.62	0.21	5,928.02	5,950.83	55 14	6,005 97
		to prior years***	01	18	42.34	6.29	0.14	3,073.89	3,122.66	854.53	3,977 18
43121-43-3	*	Triadimefon	98	4	3	0	0	1	4	0	4
			99	4	0	0	0	0	0	0	0
			00	3	2	0	0	0	2	0	2
			01	3	0	0	0	0	0	0	0
2303-17-5	*	Triallate	98	2	519	0	0	0	519	21,640	22,159
			99	4	513	0	0	0	513	496	1,009
			00	3	509	0	0	0	509	996	1,505
			01	5	573	1	0	0	574	1,046	1,620
68-76-8		Triaziquone	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
101200-48-0	*	Tribenuron methyl	98	1	1	0	0	0	1	0	1
			99	1	1	0	0	0	1	0	1
			00	1	1	0	0	0	1	0	1
			01	1	1	0	0	0	1	0	1
1983-10-4	*	Tributyltin fluoride	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
2155-70-6	*	Tributyltin methacrylate	98	2	14	10	0	0	24	0	24
			99	3	510	0	0	0	510	0	510
			00	5	1,965	0	0	0	1,965	260	2,225
			01	3	16	7	0	0	23	250	273
78-48-8	*	S,S,S-Tributyltri-thiophosphate	98	2	250	36	0	0	286	0	286
			99	2	250	161	0	0	411	0	411
			00	1	0	12	0	0	12	0	12
			01	2	5	14	0	0	19	0	19
52-68-6	*	Trichlorfon	98	5	2	0	0	0	2	0	2
			99	3	39	0	0	11,242	11,281	6,058	17,339
			00	3	409	0	0	0	409	11,518	11,927
			01	3	236	3	0	8,313	8,552	5,251	13,803
76-02-8		Trichloroacetyl chloride	98	1	1	0	0	0	1	0	1
			99	1	1	0	0	0	1	0	1
			00	1	1	0	0	0	1	0	1
			01	1	1	0	0	0	1	0	1
120-82-1	*	1,2,4-Trichloro-benzene	98	34	166,133	441	8,965	20	175,559	2,158	177,717
			99	34	173,630	267	7,100	10	181,007	1,952	182,959
			00	34	158,945	119	3,150	0	162,214	4,636	166,850
			01	35	96,833	96	3,005	7,710	107,644	9,252	116,896

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year NR not reportable (chemicals added to the TRI list after 1998)

No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

*** Data for PBT chemicals, due to threshold change for 2000 reporting year, are not comparable to prior year reporting See Chapter 3 for more information

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
** o-Toluidine hydrochloride	98	0	0	0	0	0	0	0	0	0
	99	0	0	0	0	191,883	0	168	192,051	0
	00	0	0	0	0	154,846	744	35	155,625	0
	01	0	0	330	1,491	145,321	74	19	147,235	0
*,** Toxaphene	98	0	0	0	0	103,929	1	25,602	129,532	0
	99	0	0	0	0	134,998	28	27	135,053	0
Not comparable	00	0.00	0.00	1,072.00	0.00	210,240.69	468 24	6,007.47	217,788.40	0.00
to prior years***	01	0.00	3.00	1,138.00	7.20	124,183.14	464.80	4,378.99	130,175.13	0.00
* Triadimefon	98	0	0	0	0	280	1,984	4	2,268	0
	99	0	0	0	0	0	0	0	0	0
	00	0	0	0	0	342	458	2	802	0
	01	0	0	0	0	20	548	0	568	0
* Triallate	98	0	0	0	0	6,480	97,751	22,410	126,641	0
	99	840	0	0	0	12,825	47,151	1,508	62,324	0
	00	884	0	0	0	22,110	32,887	1,996	57,877	0
	01	127	0	13,399	6	54,803	16,678	864	85,877	0
Triaziquone	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
* Tribenuron methyl	98	0	0	0	0	0	13,016	1	13,017	0
	99	0	0	0	0	0	14,832	1	14,833	0
	00	0	0	0	0	0	17,700	1	17,701	0
	01	0	0	0	0	0	22,568	1	22,569	0
* Tributyltin fluoride	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
* Tributyltin methacrylate	98	253	0	0	419	0	0	34	706	0
	99	3,458	0	0	3,218	0	3,100	3,330	13,106	0
	00	0	11,613	0	6,210	11	5,660	2,765	26,259	0
	01	0	6,779	0	0	100,348	65,998	194	173,319	0
* S,S,S-Tributyltri-thiophosphate	98	0	0	0	0	10,276	691	367	11,334	0
	99	0	0	0	0	13,441	694	292	14,427	0
	00	0	0	0	0	1,891	85	12	1,988	0
	01	0	0	0	0	29,574	194	15	29,783	0
* Trichlorfon	98	0	0	0	0	213	2,831	2	3,046	0
	99	0	0	0	0	1,331	890	18,229	20,450	0
	00	0	0	0	0	785	480	12,407	13,672	0
	01	0	0	0	0	1,783	1,300	13,803	16,886	0
Trichloroacetyl chloride	98	0	0	0	0	0	0	1	1	0
	99	0	0	0	0	0	0	1	1	0
	00	0	0	0	0	0	0	1	1	0
	01	0	0	0	0	0	0	1	1	0
* 1,2,4-Trichloro-benzene	98	1,115,301	22,393	66,119	25,218	714,244	199,936	176,401	2,319,612	35
	99	1,262,006	6,595	1,494,567	62,078	1,506,015	234,018	181,437	4,746,716	181
	00	1,203,313	15,884	539,513	21,833	999,758	201,165	164,106	3,145,572	9
	01	50,556	27,543	324,130	268,618	2,682,941	113,214	115,246	3,582,248	1,508

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

*** Data for PBT chemicals, due to threshold change for 2000 reporting year, are not comparable to prior year reporting See Chapter 3 for more information.

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	Surface Water Discharges Pounds	Underground Injection Pounds	Releases to Land Pounds	Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
71-55-6	*	1,1,1-Trichloro-ethane	98	166	840,973	667	0	4,980	846,620	31,399	878,019
			99	92	410,845	45	0	15,981	426,871	53,067	479,938
			00	75	267,671	85	5	14,298	282,059	2,200	284,259
			01	51	206,609	22	5	169	206,805	2,582	209,387
79-00-5	*	1,1,2-Trichloro-ethane	98	35	280,213	790	5	1	281,009	2,326	283,335
			99	35	199,121	926	0	13,788	213,835	484	214,319
			00	33	91,189	572	5	11,813	103,579	7,967	111,546
			01	25	84,383	15	0	554	84,952	1,274	86,226
79-01-6	*,**	Trichloroethylene	98	730	13,265,539	882	593	800	13,267,814	126,053	13,393,867
			99	646	10,616,607	1,044	0	148,867	10,766,518	168,374	10,934,892
			00	598	9,759,536	593	47,877	9,713	9,817,719	159,396	9,977,115
			01	525	8,249,317	406	98,220	12,609	8,360,552	121,748	8,482,300
75-69-4	*	Trichlorofluoro-methane (CFC-11)	98	43	443,267	1,734	250	0	445,251	109	445,360
			99	41	402,657	1,001	0	10,078	413,736	14,676	428,412
			00	43	305,062	961	0	0	306,023	141	306,164
			01	35	298,622	545	0	15,568	314,735	7,759	322,494
95-95-4	*	2,4,5-Trichloro-phenol	98	3	201	36	0	69	306	0	306
			99	6	279	42	0	21,922	22,243	269	22,512
			00	5	339	51	0	36,021	36,411	82	36,493
			01	6	162	3,493	5	10,082	13,742	1,008	14,750
88-06-2	*,**	2,4,6-Trichloro-phenol	98	4	118	26	0	0	144	10	154
			99	5	90	39	0	2,002	2,131	6	2,137
			00	5	114	29	0	1	144	7	151
			01	5	60	64	0	1	125	506	631
96-18-4	**	1,2,3-Trichloro-propane	98	8	13,837	300	0	0	14,137	6,758	20,895
			99	12	13,959	2,300	0	8,189	24,448	4,412	28,860
			00	11	16,614	5,498	0	28	22,140	0	22,140
			01	9	9,528	802	0	12,084	22,414	5,887	28,301
57213-69-1	*	Triclopyr triethyl-ammonium salt	98	3	6	0	0	0	6	0	6
			99	1	37	0	0	0	37	0	37
			00	3	9	0	0	0	9	0	9
			01	5	9	0	0	0	9	0	9
121-44-8		Triethylamine	98	196	1,573,105	26,281	186,190	23,755	1,809,331	56,313	1,865,644
			99	186	1,975,258	17,937	28,659	35,032	2,056,886	289,800	2,346,686
			00	186	1,890,605	27,218	18,990	13,937	1,950,750	119,972	2,070,722
			01	178	1,624,316	22,787	45,714	19,292	1,712,109	128,346	1,840,455
1582-09-8	*	Trifluralin	98	20	9,193	250	0	5	9,448	29,888	39,336
			99	20	5,185	0	0	0	5,185	14,631	19,816
		Not comparable to prior years***	00	31	5,694.15	0.00	0 00	19,371 00	25,065.15	2,748.67	27,813.82
			01	31	2,896.17	1.00	115.00	17,113.70	20,125.87	2,390.11	22,515.98
26644-46-2	*	Triforine	98	1	0	0	0	0	0	0	0
			99	No reports							
			00	1	187	0	0	0	187	0	187
			01	1	255	0	0	0	255	0	255
95-63-6		1,2,4-Trimethyl-benzene	98	1,534	7,947,119	8,490	6,650	17,789	7,980,048	181,117	8,161,165
			99	1,517	7,844,333	6,869	2,295	10,380	7,863,877	111,646	7,975,523
			00	1,535	7,699,925	7,801	3,710	11,638	7,723,074	176,355	7,899,429
			01	1,524	7,166,019	6,525	1,790	29,120	7,203,454	104,880	7,308,334

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year. NR not reportable (chemicals added to the TRI list after 1998)

No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

*** Data for PBT chemicals, due to threshold change for 2000 reporting year, are not comparable to prior year reporting See Chapter 3 for more information

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
* 1,1,1-Trichloroethane	98	2,276,712	164,553	2,982,403	2,726,756	1,879,745	907,594	809,743	11,747,506	19,845
	99	1,685,059	206,605	2,043,213	1,481,056	4,325,155	441,694	448,797	10,631,579	983
	00	975,810	36,704	1,346,260	1,343,576	5,348,212	277,788	274,439	9,602,789	7,606
	01	651,193	16,663	1,135,118	1,048,434	2,725,899	270,443	242,042	6,089,792	6,300
* 1,1,2-Trichloroethane	98	55,855,000	12,399,585	4,961,599	33,052	44,449,926	2,055,682	285,681	120,040,525	48
	99	50,477,000	16,038,204	189,669	212,449	46,286,611	754,272	215,093	114,173,298	892
	00	50,811,610	7,445,333	4,067,013	75,560	44,669,906	1,293,327	108,500	108,471,249	7,199
	01	44,413,491	2,504,599	5,203,838	140	33,929,513	2,514,691	85,564	88,651,836	12,006
*,** Trichloroethylene	98	137,119,808	4,814,735	2,422,389	1,470,592	8,610,230	7,466,698	13,205,544	175,109,996	124,030
	99	137,490,808	4,068,707	3,515,395	1,274,790	6,858,805	1,942,366	10,536,839	165,687,710	50,358
	00	126,124,653	3,563,836	1,792,566	1,718,331	6,119,729	1,515,316	9,933,225	150,767,656	61,286
	01	140,436,215	3,029,470	1,988,713	856,625	5,614,707	1,335,905	9,359,639	162,621,274	54,062
* Trichlorofluoromethane (CFC-11)	98	0	138,866	210,039	128,122	633,096	297,684	444,151	1,851,958	25
	99	83,525	92,780	1,189,772	124,082	618,099	458,100	425,463	2,991,821	8,686
	00	171,898	102,023	232,249	12,292	577,088	402,517	306,220	1,804,287	40
	01	107,620	109,768	217,225	34,920	349,303	401,244	325,459	1,545,539	7
* 2,4,5-Trichlorophenol	98	0	0	0	0	51,152	5	306	51,463	0
	99	0	0	0	0	343,729	40	22,535	366,304	0
	00	0	0	0	0	166,393	14	36,486	202,893	0
	01	0	0	0	0	202,564	6	14,326	216,896	0
*,** 2,4,6-Trichlorophenol	98	0	0	0	0	1,128,000	0	150	1,128,150	0
	99	0	0	0	0	1,399,542	46	127	1,399,715	2,000
	00	0	13,933	0	0	1,291,102	9	144	1,305,188	0
	01	0	280,960	0	0	1,220,931	1	652	1,502,544	0
** 1,2,3-Trichloropropane	98	7,100,000	0	870,000	0	2,553,000	5,949,995	14,187	16,487,182	0
	99	9,300,000	0	678,000	0	47,284,964	660,000	28,872	57,951,836	0
	00	12,000,000	0	5,610,685	0	56,798,048	3,219,000	22,202	77,649,935	0
	01	850,762	0	28,625,849	77,600	7,648,305	5,909,680	29,590	43,141,786	0
* Triclopyr triethylammonium salt	98	0	0	0	0	0	70	6	76	0
	99	0	0	0	0	55	68	37	160	0
	00	0	0	0	0	15	130	9	154	0
	01	0	0	0	0	13	150	9	172	0
Triethylamine	98	332,653	677,152	380,472	412,334	4,403,232	867,852	2,137,380	9,211,075	114
	99	113,198	738,564	486,746	468,385	3,862,005	1,107,435	2,670,792	9,447,125	480
	00	151,958	902,247	220,570	688,659	5,003,076	853,078	2,105,042	9,924,630	209
	01	108,054	930,819	337,037	607,064	5,434,000	1,066,801	1,851,857	10,335,632	14,907
* Trifluralin	98	80,000	0	0	0	36,707	75,025	30,425	222,157	0
	99	89,000	0	0	0	40,210	71,489	23,222	223,921	0
Not comparable to prior years***	00	7,501.00	0.00	0.00	228.00	16,709.08	109,807.00	33,522.47	167,767.55	45.00
	01	7,702.00	0.00	0.00	626.00	297,841.95	79,243.00	22,661.75	408,074.70	679.00
* Triforine	98	0	0	0	0	0	0	0	0	0
	99	No reports								
	00	0	0	0	0	0	118	182	300	0
	01	0	0	0	0	0	69	107	176	0
1,2,4-Trimethylbenzene	98	15,943,528	2,528,986	8,208,452	3,855,356	11,018,711	849,686	8,872,956	51,277,675	153,746
	99	21,567,474	1,737,051	11,817,095	5,013,134	11,220,494	668,698	8,021,036	60,044,982	31,576
	00	12,310,536	2,314,924	8,689,649	5,070,297	12,331,156	751,917	7,669,141	49,137,620	10,097
	01	11,625,912	3,508,541	7,064,483	3,858,308	11,459,895	698,303	7,330,655	45,546,097	189,804

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998).
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U.S.) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides.

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

*** Data for PBT chemicals, due to threshold change for 2000 reporting year, are not comparable to prior year reporting See Chapter 3 for more information

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	On-site Releases: Surface Water Discharges Pounds	On-site Releases: Underground Injection Pounds	On-site Releases: Releases to Land Pounds	On-site Releases: Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
2655-15-4	*	2,3,5-Trimethyl-phenyl methyl-carbamate	98	No reports							
			99	No reports							
			00	No reports							
			01	No reports							
639-58-7	*	Triphenyltin chloride	98	1	0	0	0	0	0	0	0
			99	1	3	0	0	0	3	0	3
			00	1	1	0	0	0	1	0	1
			01	1	0	0	0	0	0	0	0
76-87-9	*	Triphenyltin hydroxide	98	3	7	0	0	0	7	235	242
			99	5	1,001	0	0	0	1,001	1,085	2,086
			00	5	1,002	0	0	0	1,002	0	1,002
			01	5	257	0	0	0	257	0	257
126-72-7	**	Tris(2,3-dibromo-propyl) phosphate	98	1	0	0	0	0	0	0	0
			99	1	2	1	0	0	3	5	8
			00	2	0	0	0	0	0	10	10
			01	2	0	0	0	0	0	260	260
72-57-1	**	Trypan blue	98	2	0	0	0	0	0	0	0
			99	3	5	0	0	0	5	163	168
			00	3	0	0	0	0	0	5	5
			01	3	0	0	0	0	0	260	260
51-79-6	**	Urethane	98	3	1,417	22	0	0	1,439	2,224	3,663
			99	7	90	1	0	14,249	14,340	929	15,269
			00	11	1,447	29,580	0	12,667	43,694	27,675	71,369
			01	10	1,110	0	0	17,684	18,794	24,218	43,012
7440-62-2		Vanadium (except when contained in an alloy)	98	31	53,209	616	0	1,253,179	1,307,004	97,999	1,405,003
			99	37	17,131	683	0	1,087,208	1,105,022	186,253	1,291,275
			00	69	80,217	3,599	8,121	1,879,816	1,971,753	1,205,908	3,177,661
			01	57	247,120	1,081	18,507	1,720,673	1,987,381	2,337,313	4,324,694
--		Vanadium compounds	98	NR	NR	NR	NR	NR	NR	NR	NR
			99	NR	NR	NR	NR	NR	NR	NR	NR
			00	462	2,126,896	644,654	1,192,983	76,367,856	80,332,389	6,272,002	86,604,391
			01	487	1,399,953	639,856	882,575	78,935,812	81,858,196	6,641,947	88,500,143
50471-44-8	*	Vinclozolin	98	2	10	0	0	0	10	750	760
			99	1	0	0	0	0	0	0	0
			00	1	0	0	0	0	0	0	0
			01	2	0	0	0	0	0	0	0
108-05-4	**	Vinyl acetate	98	207	3,384,013	3,665	285,141	56,125	3,728,944	127,552	3,856,496
			99	198	3,392,243	3,948	286,764	38,340	3,721,295	372,536	4,093,831
			00	199	3,152,104	2,377	223,927	104,809	3,483,217	18,918	3,502,135
			01	193	2,874,635	2,035	453,683	60,623	3,390,976	20,903	3,411,879
593-60-2	**	Vinyl bromide	98	1	0	0	0	0	0	0	0
			99	2	500	0	0	0	500	0	500
			00	No reports							
			01	No reports							
75-01-4	**	Vinyl chloride	98	55	885,387	78	154	0	885,619	69,214	954,833
			99	51	855,691	103	405	1	856,200	14,015	870,215
			00	52	773,239	177	43,650	0	817,066	623	817,689
			01	54	732,219	102	96,042	1	828,364	1,002	829,366

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 Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

98o, 99o and 00o are data from original industries, 98n, 99n and 00n are data from new industries
NR not reportable (chemicals added to the TRI list after 1988)
DC definition change (chemicals whose reporting definition has changed since 1988)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen (see Appendix C for more information) Ethylbenzene meets OSHA carcinogen standard effective for the 2001 reporting year

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
* 2,3,5-Trimethyl-phenyl methyl-carbamate	98	No reports								
	99	No reports								
	00	No reports								
	01	No reports								
* Triphenyltin chloride	98	0	0	0	0	0	0	0	0	0
	99	0	0	0	0	26,226	0	3	26,229	0
	00	0	0	0	0	10,273	0	1	10,274	0
	01	0	0	0	0	4,825	0	0	4,825	0
* Triphenyltin hydroxide	98	0	0	0	0	16,465	1,273	237	17,975	0
	99	0	0	0	0	6,900	2,867	609	10,376	0
	00	0	0	0	0	24,570	1,158	87	25,815	0
	01	29,000	0	0	0	24,295	1,410	332	55,037	0
** Tris(2,3-dibromo-propyl) phosphate	98	0	0	0	0	0	0	0	0	0
	99	0	0	0	0	33,000	0	2	33,002	0
	00	0	0	0	0	45,140	982	7	46,129	0
	01	0	0	0	0	63,282	960	61	64,303	0
** Trypan blue	98	0	0	0	0	0	0	0	0	0
	99	0	0	0	0	192,524	0	168	192,692	0
	00	0	0	0	0	152,211	785	2	152,998	0
	01	0	0	330	691	139,481	44	22	140,568	0
** Urethane	98	0	0	0	0	168,481	0	3,663	172,144	0
	99	0	0	518	1,473	680,048	0	14,765	696,804	0
	00	0	0	11,724	13,409	449,969	34,723	71,134	580,959	0
	01	0	0	15,113	3,394	778,227	165	43,012	839,911	0
Vanadium (except when contained in an alloy)	98	2,920	44,903	0	0	0	0	1,384,389	1,432,212	0
	99	86,633	35,862	0	0	0	2,809	1,183,245	1,308,549	90,026
	00	86,086	879,098	0	0	0	10,970	3,083,605	4,059,759	70,530
	01	79,603	784,232	0	0	0	1,387	4,220,139	5,085,361	921,608
Vanadium compounds	98	NR	NR	NR	NR	NR	NR	NR	NR	NR
	99	NR	NR	NR	NR	NR	NR	NR	NR	NR
	00	1,393,009	2,726,304	8	0	165,762	60,687	83,035,243	87,381,013	3,251,966
	01	887,130	2,703,852	0	0	95,502	35,153	88,856,599	92,578,236	100,734
* Vinclozolin	98	0	0	0	0	650	660	1	1,311	0
	99	0	0	0	0	0	0	0	0	0
	00	0	0	0	0	0	0	0	0	0
	01	0	0	0	0	0	0	0	0	0
** Vinyl acetate	98	993,710	86,991	18,008,261	16,805,998	28,073,111	1,498,924	3,687,077	69,154,072	62,310
	99	1,158,990	13,249	21,815,185	13,574,613	20,914,900	1,090,996	3,771,129	62,339,062	2,313,481
	00	1,038,436	3,896	18,585,538	10,932,118	15,063,237	1,924,348	3,567,759	51,115,332	13,767
	01	1,000,678	36,799	17,640,079	6,005,589	13,071,306	6,022,992	3,439,286	47,216,729	5,594
** Vinyl bromide	98	0	0	0	0	0	0	0	0	0
	99	0	0	0	0	0	0	50	50	0
	00	No reports								
	01	No reports								
** Vinyl chloride	98	377,999,298	857,715	25,083,408	20,780	37,025,589	591,050	874,517	442,452,357	19,820
	99	421,323,079	785,132	28,607,150	137,672	36,054,708	439,487	906,597	488,253,825	57,485
	00	427,180,214	754,310	25,758,170	13,311	34,433,686	273,723	979,922	489,393,336	20,698
	01	135,203,875	15,084	20,026,956	8,733	25,773,458	5,705,730	821,674	187,555,510	17,833

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1A: TRI On-site and Off-site Releases, by Chemical, 1998-2001 *(continued)*

CAS Number		Chemical	Year	Total Forms Number	On-site Releases: Total Air Emissions Pounds	On-site Releases: Surface Water Discharges Pounds	On-site Releases: Underground Injection Pounds	On-site Releases: Releases to Land Pounds	On-site Releases: Total On-site Releases Pounds	Off-site Releases: Transfers Off-site to Disposal Pounds	Total On and Off-site Releases Pounds
75-35-4	*	Vinylidene chloride	98	33	181,513	561	46,030	82,000	310,104	12,357	322,461
			99	33	158,684	133	99	14,945	173,861	937	174,798
			00	34	146,760	1,629	204	328,972	477,565	679	478,244
			01	33	141,876	428	632	19,837	162,773	656	163,429
--		Warfarin and salts	98	No reports							
			99	4	10	0	0	0	10	327	337
			00	3	2	0	0	0	2	72	74
			01	2	0	0	0	0	0	0	0
108-38-3		m-Xylene	98	85	1,199,852	1,070	4,199	860	1,205,981	29,939	1,235,920
			99	82	981,937	85	3,578	3,948	989,548	45,753	1,035,301
			00	73	626,000	193	3,555	5,554	635,302	18,278	653,580
			01	70	545,240	36	2,324	1,871	549,471	20,047	569,518
95-47-6		o-Xylene	98	105	1,347,696	965	3,088	41,350	1,393,099	102,777	1,495,876
			99	100	895,071	82	3,379	44,287	942,819	138,162	1,080,981
			00	99	742,213	2,565	3,376	626	748,780	34,570	783,350
			01	83	774,117	52	2,639	63	776,871	52,972	829,843
106-42-3		p-Xylene	98	58	1,841,331	730	3,227	55	1,845,343	18,212	1,863,555
			99	54	1,713,819	87	3,578	570	1,718,054	24,798	1,742,852
			00	54	1,321,313	198	3,555	166	1,325,232	8,242	1,333,474
			01	42	1,349,125	95	2,324	24,508	1,376,052	8,789	1,384,841
1330-20-7	*	Xylene (mixed isomers)	98	3,729	70,512,765	57,507	124,315	109,671	70,804,258	1,488,887	72,293,145
			99	3,561	67,881,540	30,113	87,520	252,584	68,251,757	2,118,280	70,370,037
			00	3,444	58,481,728	82,243	151,178	142,785	58,857,934	1,318,611	60,176,545
			01	3,199	47,081,406	21,972	81,071	177,294	47,361,743	1,158,921	48,520,664
87-62-7	*,**	2,6-Xylidine	98	3	453	0	0	0	453	0	453
			99	2	1	0	0	0	1	0	1
			00	1	1	0	0	0	1	0	1
			01	2	14	0	0	0	14	0	14
7440-66-6	*	Zinc (fume or dust)	98	462	1,391,077	40,539	294,943	74,519,262	76,245,821	9,935,739	86,181,560
			99	443	1,406,023	23,441	1	56,252,063	57,681,528	16,173,800	73,855,328
			00	419	794,465	22,010	2	37,555,894	38,372,371	14,785,655	53,158,026
			01	399	870,792	15,426	44,518	33,695,443	34,626,179	11,297,950	45,924,130
--		Zinc compounds	98	3,423	95,495,251	1,824,590	21,997,661	782,071,416	901,388,918	124,776,151	1,026,165,069
			99	3,469	8,485,157	1,386,796	22,177,372	831,523,302	863,572,627	130,416,020	993,988,647
			00	3,502	7,454,100	1,282,189	22,580,398	828,129,701	859,446,388	170,125,877	1,029,572,265
			01	3,390	6,159,692	2,172,966	9,656,931	738,610,608	756,600,197	205,468,291	962,068,488
12122-67-7	*	Zineb	98	2	101	0	0	0	101	1	102
			99	1	10	0	0	0	10	0	10
			00	No reports							
			01	1	5	0	0	0	5	505	510
--		Mixtures and other trade name products	98	59	74,154	0	0	9	74,163	86,098	160,261
			99	51	218,595	0	0	500	219,095	25,649	244,744
			00	46	615	0	0	40,100	40,715	44,378	85,093
			01	112	101,848	750	0	3,537	106,135	22,474	128,609
--		Trade secrets	98	11	30	0	0	0	30	0	30
			99	3	0	0	0	0	0	0	0
			00	3	0	0	0	0	0	0	0
			01	2	0	0	0	0	0	0	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. Breakdown of Underground Injection and On-site Land Releases (for RCRA Subtitle C landfills) began in 1996 reporting year

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Table A-1B: Quantities of TRI Chemicals in Waste, by Chemical, 1998-2001 *(continued)*

Chemical	Year	Recycled On-site Pounds	Recycled Off-site Pounds	Energy Recovery On-site Pounds	Energy Recovery Off-site Pounds	Treated On-site Pounds	Treated Off-site Pounds	Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
* Vinylidene chloride	98	1,830,000	8,606	125,000	91,015	4,294,231	17,145	322,249	6,688,246	81
	99	3,977,000	21,860	100,000	66,964	2,544,483	41,010	208,407	6,959,724	145
	00	1,620,000	2,925	200,000	44,472	2,908,777	24,749	181,006	4,981,929	1,281
	01	1,551,367	822	390,806	149,050	3,161,210	81,153	162,874	5,497,282	1,709
Warfarin and salts	98	No reports								
	99	0	0	0	0	309,501	1	338	309,840	0
	00	0	0	0	0	202,284	0	74	202,358	0
	01	0	0	0	0	108,481	0	0	108,481	0
m-Xylene	98	1,915,527	162,342	9,462,285	436,809	1,084,879	126,038	1,233,872	14,421,752	19,071
	99	1,335,709	112,672	11,882,415	486,427	960,452	103,696	1,003,784	15,885,155	15,278
	00	4,344,222	350,344	10,109,064	445,221	889,781	40,664	656,054	16,835,350	431
	01	326,998	39,856	7,482,614	436,822	417,623	106,883	580,445	9,391,241	4,652
o-Xylene	98	103,367	15,218	6,965,568	1,948,285	2,099,235	815,726	1,403,971	13,351,370	14,899
	99	1,047,906	8,764	7,989,008	2,020,177	2,063,253	414,093	1,175,222	14,718,423	13,514
	00	9,055,394	384	5,654,825	957,459	2,614,290	963,866	1,085,399	20,331,617	4,751
	01	8,122,177	7,489	1,997,338	467,085	1,935,544	181,552	1,313,835	14,025,020	4,453
p-Xylene	98	126,840	395	4,670,124	189,448	2,866,722	156,678	1,858,164	9,868,371	14,187
	99	147,846	7	683,856	234,234	1,937,576	77,621	1,763,250	4,844,390	11,833
	00	178,703	7	2,663,410	128,534	2,251,786	53,976	1,326,753	6,603,169	10,349
	01	3,578,849	2,199	4,968,069	22,277,020	2,430,690	79,120	1,364,222	34,700,169	174,687
* Xylene (mixed isomers)	98	129,828,050	39,098,393	141,505,558	144,257,281	74,242,226	22,650,264	76,233,785	627,815,557	254,569
	99	132,164,663	34,774,046	119,792,335	110,701,307	71,063,900	20,660,931	69,853,184	559,010,366	364,234
	00	106,724,282	31,618,502	109,899,891	108,505,791	75,153,649	15,232,206	63,175,406	510,309,726	127,224
	01	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
*,**2,6-Xylidine	98	0	4	22,235	0	0	0	453	22,692	0
	99	0	0	0	2,904	17	0	1	2,922	0
	00	0	0	0	3,900	29	0	1	3,930	0
	01	0	0	0	108,000	47	27	15	108,089	0
* Zinc (fume or dust)	98	28,252,595	49,368,687	0	125,059	652,837	741,490	98,267,388	177,408,056	2,282,657
	99	6,124,363	55,342,801	0	58,144	606,425	604,136	83,282,430	146,018,299	16
	00	6,601,018	42,697,358	0	141,555	968,888	257,019	53,447,517	104,113,355	119,207
	01	5,278,971	36,137,304	0	19,930	916,034	96,702	46,889,001	89,337,942	1,027,036
Zinc compounds	98	76,027,315	275,719,276	367,541	270,668	5,661,330	12,579,485	1,000,435,483	1,371,061,097	1,405,980
	99	91,292,781	293,412,489	142,280	173,258	22,342,193	9,572,650	1,013,273,429	1,430,209,080	267,037,408
	00	101,270,500	305,046,621	144,790	227,926	9,969,206	11,607,619	1,050,863,256	1,479,129,918	20,032,070
	01	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
* Zineb	98	0	0	0	100	11,715	0	102	11,917	0
	99	0	0	0	0	0	320	9	329	0
	00	No reports								
	01	0	0	0	0	17,404	429	433	18,266	0
Mixtures and other trade name products	98	10,427,837	14,255	1,367,661	14,955	23,598	72,626	108,558	12,029,490	0
	99	39,297	7,316	700	43,758	233,209	14,608	262,325	601,213	0
	00	0	18,844	0	32,445	0	3,858	28,097	83,244	10
	01	18,197	53,714	0	500	1,977,082	47,828	151,199	2,248,520	28,232
Trade secrets	98	0	0	0	0	2,700	0	30	2,730	0
	99	0	0	0	0	0	0	0	0	0
	00	0	0	0	0	0	0	0	0	0
	01	0	0	0	0	0	0	0	0	0

Note: Data from Section 8 (Current Year) of Form R

NR not reportable (chemicals added to the TRI list after 1998)
No reports No reports received for the chemical in that reporting year

* Chemicals that are currently active ingredients in EPA's Pesticide Product Information System (all pesticide products imported and/or manufactured in the U S) and/or Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Active Ingredients, including Special Review, Canceled/Denied or Suspended, and Restricted Use Pesticides

** Chemicals meeting the OSHA carcinogen standard (see Appendix C for more information)

Appendix B

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

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

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

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

* Only fume or dust forms are reportable.
** Except when contained in an alloy

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

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

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

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

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

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

d Reported as discharges to POTWs in Section 6 1 of Form R EPA considers transfers of metals and metal category compounds to POTWs as an off-site release because sewage treatment does not destroy the metal content of the waste material

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

* Only fume or dust forms are reportable

** Except when contained in an alloy

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

Chemical	Recycled		Energy Recovery		Treated		Quantity Released On-and Off-site Pounds	Total Production-related Waste Managed Pounds	Non-Production-related Waste Managed Pounds
	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds	On-site Pounds	Off-site Pounds			
Aluminum* (CAS number 7429-90-5)	5,996,088	21,267,827	0	628	20,598,920	486,721	16,903,098	65,253,282	7,703
Antimony and antimony compounds	10,420,394	3,974,156	0	10,353	114,580	112,958	25,246,003	39,878,444	361,375
Arsenic and arsenic compounds	6,725,411	492,659	0	0	20,476	28,606	380,419,204	387,686,356	1,900,657
Barium and barium compounds	51,471,520	4,771,871	58,814	7,106	7,924,180	648,197	260,590,111	325,871,799	2,088,576
Beryllium and beryllium compounds	118,817	187,648	0	0	0	950	955,232	1,262,647	2,156
Cadmium and cadmium compounds	1,995,002	588,428	0	0	5,577	6,922	15,038,629	17,634,558	221,612
Chromium and chromium compounds	30,022,653	118,170,892	5,052	26,506	2,578,165	1,012,246	130,937,050	282,752,563	2,878,443
Cobalt and cobalt compounds	3,796,493	8,802,867	0	4,167	2,043,007	32,197	16,397,340	31,076,071	107,708
Copper and copper compounds	633,034,067	680,617,091	0	14,433	753,170	1,568,625	1,035,786,000	2,351,773,385	10,227,432
Lead and lead compounds	543,676,921	258,775,082	96,066	119,026	1,259,680	1,002,540	428,651,480	1,233,580,793	18,333,736
Manganese and manganese compounds	36,981,649	127,523,080	3,748	0	965,231	796,221	431,564,230	597,834,158	2,596,769
Mercury and mercury compounds	735,097	161,542	77	2	10,863	37,797	4,873,160	5,818,537	16,014
Nickel and nickel compounds	35,980,641	108,221,042	5,482	3,045	933,690	564,135	78,289,725	223,997,760	1,639,985
Selenium and selenium compounds	760,440	23,157	0	50	327	1,167	10,163,165	10,948,306	66,049
Silver and silver compounds	893,057	3,067,059	0	0	541	1,669	2,850,815	6,813,141	94,897
Thallium and thallium compounds	76,604	7,200	0	0	0	0	3,893,187	3,976,991	16,605
Vanadium** and vanadium compounds	966,733	3,488,085	0	0	95,502	36,540	93,076,738	97,663,598	1,022,342
Zinc* and zinc compounds	90,242,598	310,482,323	140,775	60,468	11,378,587	2,794,434	1,029,743,574	1,444,842,759	6,421,004
Total	**1,453,894,184**	**1,650,622,009**	**310,014**	**245,783**	**48,682,495**	**9,131,924**	**3,965,778,738**	**7,128,665,148**	**48,003,063**

Note: Data are from Section 8 of Form R

* Only fume or dust forms are reportable.

** Except when contained in an alloy

Appendix C

Basis of OSHA Carcinogen Listing for Individual Chemicals

Appendix C

Basis of OSHA Carcinogen Listing for Individual Chemicals

Under Section 313, a chemical does not have to be counted towards threshold determinations and release and other waste management calculations if it is present in a mixture below a certain concentration. This is known as the section 313 *"de minimus"* concentration in mixture. When the section 313 rule was developed, EPA adopted the *de minimus* percentages from the Occupational Safety and Health Administration's (OSHA) Hazard Communication Standards (29 CFR 1910.1900) because much of the information that industry would have relating to chemicals in mixtures would most likely be from the material safety data sheet (MSDS) on that mixture. The OSHA *de minimus* limitation is 0.1 percent if the chemical is a known or suspect carcinogen by virtue of appearing in one of three sources:

1. National Toxicology Program (NTP), "Annual Report on Carcinogens" (Latest Editions);

2. International Agency for Research on Cancer (IARC) "Monographs" (Latest Editions);

3. 29 CFR 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration.

The *de minimus* limitation is 1.0 percent for chemicals that do not meet the above OSHA carcinogen criteria. The carcinogen designation in the list of chemicals relates to any chemical that the Agency determined met the above OSHA criteria for the 0.1 percent *de minimus* limitation. Certain metal compound categories have two *de minimus* limitations. For example, hexavalent chromium compounds and inorganic arsenic compounds meet the OSHA carcinogen criteria, while trivalent chromium compounds and organic arsenic do not meet the OSHA criteria. In addition, there are no *de minimus* levels for persistent bioaccumulative toxic (PBT) chemicals, except for supplier notification purposes. See Chapter 3 for more information on PBT chemicals.

Table C-1 shows the specific bases for which the individual chemical was designated as a known or suspect carcinogen. This list was updated for the *2001 TRI Public Data Release Report*, based on a review of the most current NTP, IARC, and OSHA sources.

Table C-1: Basis of OSHA Carcinogen Listing for Individual Chemicals

Chemical	IARC	NTP	OSHA-Z	Chemical	IARC	NTP	OSHA-Z
Acetaldehyde	2B	P	–	C.I. Direct Black 38	2A	K	–
Acetamide	2B	–	–	C.I. Direct Blue 6	2A	K	–
2-Acetylaminofluorene	–	P	Z	C.I. Direct Brown 95	2A	–	–
Acrylamide	2A	P	–	C.I. Food Red 5	2B	–	–
Acrylonitrile	2B	P	Z	C.I. Solvent Yellow 3 (o-aminoazotoluene)	2B	P	–
2-Aminoanthraquinone	–	P	–	C.I. Solvent Yellow 34 (Auramine)	2B	–	–
4-Aminoazobenzene	2B	–	–	Cobalt and cobalt compounds	2B	–	–
4-Aminobiphenyl	1	K	Z	Creosote	2A	K	–
1-Amino-2-methylanthraquinone	–	P	–	p-Cresidine	2B	P	–
Amitrole	–	P	–	Cupferron	–	P	–
o-Anisidine	2B	–	–	2,4-D**	2B	–	–
o-Anisidine hydrochloride	–	P	–	2,4-D butoxyethyl ester**	2B	–	–
Arsenic and inorganic arsenic compounds	1	K*	Z	2,4-D butyl ester**	2B	–	–
Asbestos (friable)	1	K	Z	2,4-D chlorocrotyl ester**	2B	–	–
Benzene	1	K	Z	2,4-D 2-ethylhexyl ester**	2B	–	–
Benzidine	1	K	Z	2,4-D 2-ethyl-4-methylpentyl ester**	2B	–	–
Benzoic trichloride	2B	P	–	2,4-Diaminoanisole	2B	–	–
Beryllium and beryllium compounds	1	P*	–	2,4-Diaminoanisole sulfate	–	P	–
Bis(chloromethyl)ether	1	K	Z	4,4'-Diaminodiphenyl ether	2B	–	–
1,3-Butadiene	2A	K	–	2,4-Diaminotoluene	2B	P	–
1,2-Butylene oxide	2B	–	–	Diaminotoluene (mixed isomers)	2B	P	–
Cadmium and cadmium compounds	1	K*	–	1,2-Dibromo-3-chloropropane	2B	P	Z
Carbon tetrachloride	2B	P	–	1,2-Dibromoethane	2A	P	–
Catechol	2B	–	–	1,4-Dichlorobenzene	2B	P	–
Chlordane	2B	–	–	Dichlorobenzene (mixed isomers)	2B	P	–
Chlorendic acid	2B	P	–	3,3'-Dichlorobenzidine	2B	P	Z
p-Chloroaniline	2B	–	–	3,3'-Dichlorobenzidine dihydrochloride	2B	P	–
Chloroform	2B	P	–	3,3'-Dichlorobenzidine sulfate	2B	P	–
Chloromethyl methyl ether	1	K	Z	Dichlorobromomethane	2B	P	–
3-Chloro-2-methyl-1-propene	–	P	–	1,2-Dichloroethane	2B	P	–
Chlorophenols	2B	–	–	Dichloromethane	2B	P	–
Chloroprene	2B	P	–	trans-1,3-Dichloropropene	2B	–	–
Chlorothalonil	2B	–	–	1,3-Dichloropropylene	2B	P	–
p-Chloro-o-toluidine	2A	P	–	Dichlorvos	2B	–	–
Chromium (VI) compounds	1	K	–	Diepoxybutane	2B	P	–
C.I. Acid Red 114	2B	–	–	Di-(2-ethylhexyl)phthalate	–	P	–

Note: The list of TRI chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the de minimus level of 0.1% has been updated, and this list reflects the update.

IARC 1–The chemical is carcinogenic to humans, 2A–The chemical is probably carcinogenic to humans, 2B–The chemical is possibly carcinogenic to humans

NTP K–The chemical is known to be carcinogenic, P–The chemical may reasonably be anticipated to be carcinogenic

OSHA. Z–The chemical appears at 29 CFR part 1910 Subpart Z

* Certain compounds.

** Chlorophenoxy herbicides (IARC 2B)

Table C-1: Basis of OSHA Carcinogen Listing for Individual Chemicals

Chemical	IARC	NTP	OSHA-Z	Chemical	IARC	NTP	OSHA-Z
Diethyl sulfate	2A	P	–	Lead and inorganic lead compounds	2B	–	Z
Diglycidyl resorcinol ether	2B	P	–	Lindane	2B	P	–
Dihydrosafrole	2B	–	–	Mecoprop**	2B	–	–
3,3'-Dimethoxybenzidine	2B	P	–	Methoxone**	2B	–	–
3,3'-Dimethoxybenzidine dihydrochloride	2B	P	–	Methoxone sodium salt**	2B	–	–
3,3'-Dimethoxybenzidine hydrochloride	2B	P	–	4,4-Methylenebis (2-chloroaniline)	2A	P	–
4-Dimethylaminoazobenzene	2B	P	Z	4,4'-Methylenebis (N,N-dimethyl) benzeneamine	2B	P	–
3,3'-Dimethylbenzidine	2B	P	–	4,4'-Methylenedianiline	2B	P	Z
3,3'-Dimethylbenzidine dihydrochloride	2B	P	–	Michler's ketone	–	P	–
3,3'-Dimethylbenzidine dihydrofluoride	2B	P	–	Mustard gas	1	K	–
Dimethylcarbamyl chloride	2A	P	–	alpha-Naphthylamine	–	–	Z
1,1-Dimethylhydrazine	2B	P	–	beta-Naphthylamine	1	K	Z
Dimethyl sulfate	2A	P	–	Nickel	2B	P	–
2,4-Dinitrotoluene	2B	–	–	Nickel compounds	1	P*	–
2,6-Dinitrotoluene	2B	–	–	Nitrilotriacetic acid	–	P	–
1,4-Dioxane	2B	P	–	Nitrobenzene	2B	–	–
1,2-Diphenylhydrazine	–	P	–	4-Nitrobiphenyl	–	–	Z
2,4-D isopropyl ester**	2B	–	–	Nitrofen	2B	P	–
2,4-DP**	2B	–	–	Nitrogen mustard	2A	–	–
2,4-D propylene glycol butyl ether ester**	2B	–	–	2-Nitropropane	2B	P	–
2,4-D sodium salt**	2B	–	–	N-Nitrosodi-n-butylamine	2B	P	–
Epichlorohydrin	2A	P	–	N-Nitrosodiethylamine	2A	P	–
Ethyl acrylate	2B	–	–	N-Nitrosodimethylamine	2A	P	Z
Ethyl benzene	2B	–	–	N-Nitrosodi-n-propylamine	2B	P	–
Ethyleneimine	–	–	Z	N-Nitroso-N-ethylurea	2A	P	–
Ethylene oxide	1	K	Z	N-Nitroso-N-methylurea	2A	P	–
Ethylene thiourea	–	P	–	N-Nitrosomethylvinylamine	2B	P	–
Formaldehyde	2A	P	Z	N-Nitrosomorpholine	2B	P	–
Heptachlor	2B	–	–	N-Nitrosonornicotine	2B	P	–
Hexachlorobenzene	2B	P	–	N-Nitrosopiperidine	2B	P	–
alpha-Hexachlorocyclohexane	2B	P	–	Pentachlorophenol	2B	–	–
Hexachloroethane	2B	P	–	Phenytoin	2B	P	–
Hexamethylphosphoramide	2B	P	–	Polybrominated biphenyls (PBBs)	2B	P	–
Hydrazine	2B	P	–	Polychlorinated alkanes (C_{12}, 60% chlorinated)	–	P	–
Hydrazine sulfate	–	P	–	Polychlorinated biphenyls (PCBs)	2A	P	–

Note: The list of TRI chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the de minimus level of 0 1% has been updated, and this list reflects the update

IARC 1–The chemical is carcinogenic to humans, 2A–The chemical is probably carcinogenic to humans, 2B–The chemical is possibly carcinogenic to humans.

NTP K–The chemical is known to be carcinogenic, P–The chemical may reasonably be anticipated to be carcinogenic

OSHA Z–The chemical appears at 29 CFR part 1910 Subpart Z

* Certain compounds

** Chlorophenoxy herbicides (IARC 2B)

Table C-1: Basis of OSHA Carcinogen Listing for Individual Chemicals

Chemical	IARC	NTP	OSHA-Z	Chemical	IARC	NTP	OSHA-Z
Polycyclic aromatic compounds (PACs):				Sodium o-phenylphenoxide	2B	–	–
Benz(a)anthracene	2A	P	–	Styrene	2B	–	–
Benzo(b)fluoranthene	2B	P	–	Styrene oxide	2A	–	–
Benzo(j)fluoranthene	2B	P	–	Tetrachloroethylene	2B	P	–
Benzo(k)fluoranthene	2B	P	–	2,3,7,8-Tetrachlorodibenzo-p-dioxin	1	K	–
Benzo(rst)pentaphene	2B	–	–	Thioacetamide	2B	P	–
Benzo(a)pyrene	2A	P	–	4,4'-Thiodianiline	2B	–	–
Dibenz(a,h)acridine	2A	P	–	Thiourea	–	P	–
Dibenz(a,j)acridine	2B	P	–	Toluene-2,4-diisocyanate	2B	P	–
Dibenzo(a,h)anthracene	2B	P	–	Toluene-2,6-diisocyanate	2B	P	–
7H–Dibenzo(c,g)carbazole	2B	P	–	Toluene diisocyanate (mixed isomers)	2B	P	–
Dibenzo(a,e)pyrene	2B	P	–	o-Toluidine	2A	P	–
Dibenzo(a,h)pyrene	2B	P	–	o-Toluidine hydrochloride	–	P	–
Dibenzo(a,l)pyrene	2B	P	–	Toxaphene	2B	P	–
7,12–Dimethylbenz(a)anthracene	2B	–	–	Trichloroethylene	2A	P	–
Indeno[1,2,3–cd]pyrene	2B	P	–	2,4,6-Trichlorophenol	2B	P	–
5–Methylchrysene	2B	P	–	1,2,3-Trichloropropane	2A	P	–
1–Nitropyrene	2B	P	–	Tris(2,3-dibromopropyl)phosphate	2A	P	–
Potassium bromate	2B	–	–	Trypan blue	2B	–	–
Propane sultone	2B	P	–	Urethane	2B	P	–
beta-Propiolactone	2B	P	Z	Vinyl acetate	2B	–	–
Propyleneimine	2B	P	–	Vinyl bromide	2A	–	–
Propylene oxide	2B	P	–	Vinyl chloride	1	K	Z
Safrole	2B	P	–	2,6-Xylidine	2B	–	–

Note: The list of TRI chemicals meeting the OSHA carcinogen standard and, therefore, not reported when in a mixture at a concentration level below the de minimus level of 0 1% has been updated, and this list reflects the update

IARC 1–The chemical is carcinogenic to humans, 2A–The chemical is probably carcinogenic to humans, 2B–The chemical is possibly carcinogenic to humans.

NTP· K–The chemical is known to be carcinogenic, P–The chemical may reasonably be anticipated to be carcinogenic

OSHA Z–The chemical appears at 29 CFR part 1910 Subpart Z

* Certain compounds

** Chlorophenoxy herbicides (IARC 2B).

Appendix D

Public Access to the Toxics Release Inventory and Related Information

Appendix D

Public Access to the Toxics Release Inventory and Related Information

EPA makes the Toxics Release Inventory (TRI) and other related information available to the public both electronically and in hard copy. Every year, EPA enhances its databases to make the data easier to access and search and expands its outreach activities to include new potential users of the data. In May 2002, EPA released a number of enhancements to the TRI Explorer that greatly increased the ability of users to access TRI data (http://www.epa.gov/triexplorer/whatsnew.htm). In addition to the TRI Explorer, the TRI data are available in a wide variety of computer and hard copy formats to meet most user's needs. TRI publications can be obtained from EPA. TRI data can also be accessed online at EPA's web site, http://www.epa.gov/tri/tridata/tri01.

State officials also receive TRI reports from facilities in their jurisdiction, and many states publish reports highlighting state and local trends. Tables D–1 through D-3 highlight the products and services available from the above mentioned resources as well as several others.

TRI Document Distribution (TRI-DOCS) U.S. Environmental Protection Agency Attn: TRI Documents MC 2844T (EPA West, 5th Floor) 1200 Pennsylvania Ave., NW Washington, DC 20460 (202) 564-9554 tridocs@epa.gov	**TRI User Support Service (TRI-US)** U.S. Environmental Protection Agency Attn: TRI-USer Support MC 2844T (EPA West, 5th Floor) 1200 Pennsylvania Ave., NW Washington, DC 20460 (202) 566-0250 tri.us@epa.gov
U.S. EPA RCRA, Superfund & EPCRA Call Center (800) 424-9346 (703) 412-9810 TDD (800) 553-7672 TDD (703) 412-3323 http://www.epa.gov/epaoswer/hotline	**U.S. EPA TRI Website** http://www.epa.gov/tri http://www.epa.gov/tri/tridata/tri01

Table D-1: Toxics Release Inventory Products

Data Product	Supplier	Order Information
2001 TRI Public Data Release Report The 2001 TRI Public Data Release Report is the TRI annual report that provides a general overview of the TRI data and information on trends. The State Fact Sheets are released with the Public Data Release Report and provide a brief summary of the TRI data by State. ◆ 2001 TRI Executive Summary (reference EPA 260-S-03-001) ◆ 2001 TRI Public Data Release Report (reference EPA 260-R-03-001) ◆ 2001 State Fact Sheets Report (reference EPA 260-F-03-002)	**TRI Document Distribution (TRI-DOCS)** U.S. Environmental Protection Agency Attn: TRI Documents MC 2844T (EPA West, 5th Floor) 1200 Pennsylvania Ave., NW Washington, DC 20460 (202) 564-9554 tridocs@epa.gov	Free while supplies last.
	These documents can be viewed, printed, or downloaded from the Internet at http://www.epa.gov/tri/tridata/tri01	
2001 State Data Files in ASCII Delimited format	**U.S. EPA Toxics Release Inventory (TRI) Website**	Download from the Internet at http://www.epa.gov/triinter/tridata/tri01
Chemicals in Your Community (reference EPA 550-K-99-001) This pamphlet summarizes the information that the public can obtain under EPCRA and CAA, how to obtain such information, other information that may also be useful, and how to use these various sources of information to build a snapshot of chemicals stored and released in a community.	**U.S. EPA's National Service Center for Environmental Publications (NSCEP)** (800) 490-9198 (513) 489-8190 FAX: (513) 489-8695 Order on the Internet at http://www.epa.gov/ncepihom	Free
Chemical Fact Sheets EPA is continuing to develop Chemical Fact Sheets as part of its effort to provide the public with information on chemicals. Two types of summaries are available for each chemical. One is a two-page document providing a non-technical summary of chemical information. The other is a longer, referenced presentation of information that provides the basis for statements included in the shorter summary.	**TSCA Assistance Information Services Hotline** (202) 554-1404	Free
	The Chemical Fact Sheets can be downloaded from the Internet at http://www.epa.gov/opptintr/chemfact/	

Table D-2: Toxics Release Assistance Services

Assistance Service	Contact Information
TRI User Support Service (TRI-US) The TRI-US Service provides general information about the TRI and support for access to any of the data formats. TRI specialists can help determine the data product best suited for an individual user's needs.	**TRI User Support Service (TRI-US)** U.S. EPA Attn: TRI-USer Support MC 2844T (EPA West, 5th Floor) 1200 Pennsylvania Ave., NW Washington, DC 20460 (202) 566-0250 tri.us@epa.gov
U.S. EPA RCRA, Superfund & EPCRA Call Center U.S. EPA's RCRA, Superfund & EPCRA Call Center provides regulatory, policy, and technical assistance to the regulated community, federal agencies, local and state governments, the public, and other interested parties in response to questions related to RCRA, Superfund & EPCRA. For EPCRA, the Call Center provides information on the availability of documents related to EPCRA and copies of selected EPCRA documents on a limited basis. For more information about the Call Center, visit their Internet Web site at http://www.epa.gov/epaoswer/hotline	**U.S. EPA RCRA, Superfund & EPCRA Call Center** (800) 424-9346 (703) 412-9810 TDD: (800) 553-7672 TDD: (703) 412-3323

Table D-3: Toxics Release On-line Services

On-line Service	Web Address/Contact Information
U.S. Environmental Protection Agency (EPA)	
• **EPA Home Page**	http://www.epa.gov
• **Toxics Release Inventory (TRI) Home Page**	http://www.epa.gov/tri/
• **TRI Explorer**—EPA created the TRI Explorer to provide access to TRI data that is both easy to understand and flexible to use. The TRI Explorer will generate on- and off-site release reports for facilities, chemicals, geographic areas, or industry type (SIC code) at the county, state, and national level.	http://www.epa.gov/triexplorer/
• **TRI 2001 Data Release Page**—provides access to information relating to the 2001 TRI data release. It includes press materials, data summary information, questions and answers, and other information about 2001 TRI data.	http://www.epa.gov/tri/tridata/tri01
• **EPA Envirofacts**—provides access to TRI data. Provides user defined searches of the TRI database by facility name, geographic location, SIC Code, or chemical name and produces reports on the facilities and maps their locations. A variety of user specified param eters let users point and click to customize their searches.	http://www.epa.gov/enviro/html/toxic_releases.html
TOXNET®, the National Library of Medicine's (NLM) Toxicology Data Network, provides free access to TRI data. Users can search by chemical or other name, chemical name fragment, or Chemical Abstracts Service Registry Number. Also searchable are facility or parent company name, state, city, county, or zip code. Search results can be limited to releases greater than a specified number of pounds, and individual releases can be summed together to display a total amount.	http://toxnet.nlm.nih.gov/
Right-to-Know Network (RTK Net) is operated by two nonprofit organizations (OMB Watch and the Center for Public Data Access). RTK Net provides free access to TRI data and enables users to search by geographic area, facility, industry, parent company, or off-site waste transfer.	http://rtknet.org/
EPA's Integrated Risk Information System (IRIS) is an electronic database containing information on human health effects that may result from exposure to various chemicals in the environment. IRIS was initially developed for EPA staff in response to a growing demand for consistent information on chemical substances for use in risk assessments, decision-making and regulatory activities. The information in IRIS is intended for those without extensive training in toxicology, but with some knowledge of health sciences.	http://www.epa.gov/iris

Appendix E

EPA Regional Office and State TRI Contacts

EPA Regional Section 313 Coordinators

USEPA Region 1

Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont
Dwight Peavey
USEPA Region 1 (SPT)
Assistance and Pollution Prevention Office
1 Congress Street, Suite 11000
Boston, MA 02114-2023
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Please note that a few states and territories have two TRI contacts a technical contact who provides assistance to industries on TRI reporting and receives the TRI reporting forms and a public contact who provides assistance to the public in using TRI data. Where there are two state contacts, the technical contacts are identified by an asterisk [*]

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Appendix F
TRI Form R and Form A for 2001

Appendix F
TRI Form R and Form A for 2001

Facilities reporting to the Toxics Release Inventory submit their information on TRI's Form R. If a facility's total annual reportable amount of a chemical does not exceed 500 pounds, and the facility does not manufacture, process, or otherwise use more than 1 million pounds of the chemical, it may submit a Form A certification statement. (Form A certification statement reporting is further explained in Chapter 1.) This appendix supplies copies of the Form R and Form A certification statement for the 2001 reporting year.

FORM R

The 2001 Form R is divided into two parts:

Part I, Facility Identification Information, contains information on such matters as name, address, parent company information, and contact names and phone numbers for the facility.

Part II, Chemical-Specific Information, contains information such as chemical identity, facility activities and uses of the chemical, amounts of on- and off-site releases and transfers off-site for further waste management, including disposal, on-site waste treatment methods and efficiencies, on- and off-site waste management quantities, and information on source reduction and recycling activities.

FORM A Certification Statement

The 2001 Form A certification statement consists of facility identification information and chemical identification, as in Form R. Facilities do not report on the Form A certification statement amounts or other information about their uses, releases, or waste management of the chemical.

Readers who are interested in a more in depth understanding of who is required to report to TRI and how to fill out the forms, should refer to the RCRA, Superfund, EPCRA Call Center at (800) 424-9346, (703) 412-9810, TDD (800) 553-7672 or TDD (703) 412-3323. Reporting software, forms, and instructions for the current reporting year are available from EPA's Web site at http://www.epa.gov/triinter/report/index.htm.

(IMPORTANT: Type or print; read instructions before completing form)

EPA
United States Environmental Protection Agency

FORM R

TOXIC CHEMICAL RELEASE INVENTORY REPORTING FORM

Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986, also known as Title III of the Superfund Amendments and Reauthorization Act

WHERE TO SEND COMPLETED FORMS: 1 EPCRA Reporting Center, P.O Box 3348, Merrifield, VA 22116-3348, ATTN: TOXIC CHEMICAL RELEASE INVENTORY
2. APPROPRIATE STATE OFFICE (See instructions in Appendix F)

Enter "X" here if this is a revision

For EPA use only

Important: See instructions to determine when "Not Applicable (NA)" boxes should be checked.

PART I. FACILITY IDENTIFICATION INFORMATION

SECTION 1. REPORTING YEAR _____

SECTION 2. TRADE SECRET INFORMATION

2.1	Are you claiming the toxic chemical identified on page 2 trade secret? ☐ Yes (Answer question 2.2; Attach substantiation forms) ☐ No (Do not answer 2.2, Go to Section 3)	2.2	Is this copy ☐ Sanitized ☐ Unsanitized (Answer only if "YES" in 2.1)

SECTION 3. CERTIFICATION (Important: Read and sign after completing all form sections.)

I hereby certify that I have reviewed the attached documents and that, to the best of my knowledge and belief, the submitted information is true and complete and that the amounts and values in this report are accurate based on reasonable estimates using data available to the preparers of this report.

Name and official title of owner/operator or senior management official:	Signature:	Date Signed:

SECTION 4. FACILITY IDENTIFICATION

4.1		TRI Facility ID Number	
Facility or Establishment Name		Facility or Establishment Name or Mailing Address(if different from street address)	
Street		Mailing Address	
City/County/State/Zip Code		City/State/Zip Code	Country (Non-US)

4.2	This report contains information for: (Important : check a or b, check c or d if applicable)	a. ☐ An entire facility	b. ☐ Part of a facility	c. ☐ A Federal facility	d. ☐ GOCO	
4.3	Technical Contact Name				Telephone Number (include area code)	
4.4	Public Contact Name				Telephone Number (include area code)	

4.5	SIC Code (s) (4 digits)	Primary a.	b.	c.	d.	e.	f.

4.6	Latitude	Degrees	Minutes	Seconds	Longitude	Degrees	Minutes	Seconds

4.7	Dun & Bradstreet Number(s) (9 digits)	4.8	EPA Identification Number (RCRA I.D. No.) (12 characters)	4.9	Facility NPDES Permit Number(s) (9 characters)	4.10	Underground Injection Well Code (UIC) I D Number(s) (12 digits)
a.		a.		a.		a.	
b.		b.		b.		b.	

SECTION 5. PARENT COMPANY INFORMATION

5.1	Name of Parent Company	NA ☐	
5.2	Parent Company's Dun & Bradstreet Number	NA ☐	

EPA FORM R
PART II. CHEMICAL-SPECIFIC INFORMATION

TRI Facility ID Number

Toxic Chemical, Category or Generic Name

SECTION 1. TOXIC CHEMICAL IDENTITY (Important: DO NOT complete this section if you completed Section 2 below.)

1.1	CAS Number (Important Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category)
1.2	Toxic Chemical or Chemical Category Name (Important Enter only one name exactly as it appears on the Section 313 list)
1.3	Generic Chemical Name (Important Complete only if Part 1, Section 2.1 is checked "yes". Generic Name must be structurally descriptive.)

1.4 Distribution of Each Member of the Dioxin and Dioxin-like Compounds Category.
(If there are any numbers in boxes 1-17, then every field must be filled in with either 0 or some number between 0.01 and 100. Distribution should be reported in percentages and the total should equal 100%. If you do not have speciation data available, indicate NA)

NA ☐	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above.)

2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.)

SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY
(Important: Check all that apply.)

3.1 Manufacture the toxic chemical:	3.2 Process the toxic chemical:	3.3 Otherwise use the toxic chemical:
a. ☐ Produce b. ☐ Import	a. ☐ As a reactant	a. ☐ As a chemical processing aid
If produce or import:	b. ☐ As a formulation component	b. ☐ As a manufacturing aid
c. ☐ For on-site use/processing	c. ☐ As an article component	c. ☐ Ancillary or other use
d. ☐ For sale/distribution	d. ☐ Repackaging	
e. ☐ As a byproduct	e. ☐ As an impurity	
f. ☐ As an impurity		

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ONSITE AT ANY TIME DURING THE CALENDAR YEAR

4.1	☐ (Enter two-digit code from instruction package.)	

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE

			A. Total Release (pounds/year*) (Enter range code or estimate**)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.1	Fugitive or non-point air emissions	NA ☐			
5.2	Stack or point air emissions	NA ☐			
5.3	Discharges to receiving streams or water bodies (enter one name per box)				
	Stream or Water Body Name				
5.3.1					
5.3.2					
5.3.3					

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box ☐ and indicate the Part II, Section 5.3 page number in this box. ☐ (example: 1,2,3, etc.)

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A= 1 - 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

EPA FORM R
PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
Toxic Chemical, Category or Generic Name

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE (Continued)

		NA	A. Total Release (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)
5.4.1	Underground Injection onsite to Class I Wells	☐		
5.4.2	Underground Injection onsite to Class II-V Wells	☐		
5.5	Disposal to land onsite			
5.5.1A	RCRA Subtitle C landfills	☐		
5.5.1B	Other landfills	☐		
5.5.2	Land treatment/application farming	☐		
5.5.3	Surface Impoundment	☐		
5.5.4	Other disposal	☐		

SECTION 6. TRANSFERS OF THE TOXIC CHEMICAL IN WASTES TO OFF-SITE LOCATIONS

6.1 DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTWs)

6.1.A Total Quantity Transferred to POTWs and Basis of Estimate

6.1.A.1. Total Transfers (pounds/year*) (enter range code** or estimate)	6.1.A.2 Basis of Estimate (enter code)

6.1.B.__	POTW Name						
POTW Address							
City		State		County		Zip	
6.1.B.__	POTW Name						
POTW Address							
City		State		County		Zip	

If additional pages of Part II, Section 6.1 are attached, indicate the total number of pages in this box ☐ **and indicate the Part II, Section 6.1 page number in this box** ☐ **(example: 1,2,3, etc.)**

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS

6.2. ___ Off-Site EPA Identification Number (RCRA ID No.)									
Off-Site Location Name									
Off-Site Address									
City		State		County		Zip		Country (Non-US)	

Is location under control of reporting facility or parent company? ☐ Yes ☐ No

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A = 1 - 10 pounds; B = 11 - 499 pounds; C = 500 - 999 pounds

EPA FORM R

PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number

Toxic Chemical, Category or Generic Name

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1. M
2.	2.	2. M
3.	3.	3. M
4.	4.	4. M

6.2. ___ Off-Site EPA Identification Number (RCRA ID No.)

Off-Site location Name

Off-Site Address

City		State		County		Zip		Country (Non-US)	

Is location under control of reporting facility or parent company? ☐ Yes ☐ No

A. Total Transfers (pounds/year*) (enter range code** or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1. M
2.	2.	2. M
3.	3.	3. M
4.	4.	4. M

SECTION 7A. ON-SITE WASTE TREATMENT METHODS AND EFFICIENCY

☐ Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b Waste Treatment Method(s) Sequence [enter 3-character code(s)]	c Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.1a	7A. 1b: 1 ___ 2 ___ 3 ___ 4 ___ 5 ___ 6 ___ 7 ___ 8 ___	7A. 1c	7A. 1d %	7A. 1e Yes ☐ No ☐
7A.2a	7A. 2b: 1 ___ 2 ___ 3 ___ 4 ___ 5 ___ 6 ___ 7 ___ 8 ___	7A. 2c	7A. 2d %	7A. 2e Yes ☐ No ☐
7A.3a	7A. 3b: 1 ___ 2 ___ 3 ___ 4 ___ 5 ___ 6 ___ 7 ___ 8 ___	7A. 3c	7A. 3d %	7A. 3e Yes ☐ No ☐
7A.4a	7A. 4b: 1 ___ 2 ___ 3 ___ 4 ___ 5 ___ 6 ___ 7 ___ 8 ___	7A. 4c	7A. 4d %	7A. 4e Yes ☐ No ☐
7A.5a	7A. 5b: 1 ___ 2 ___ 3 ___ 4 ___ 5 ___ 6 ___ 7 ___ 8 ___	7A. 5c	7A. 5d %	7A. 5e Yes ☐ No ☐

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box ☐
and indicate the Part II, Section 6.2/7A page number in this box : ☐ **(example: 1,2,3, etc)**

* For Dioxin or Dioxin-like compounds, report in grams/year

** Range Codes: A = 1 - 10 pounds; B = 11 - 499 pounds; C = 500 - 999 pounds.

EPA FORM R
PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number

Toxic Chemical, Category or Generic Name

SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES

☐ Not Applicable (NA) - Check here if no on-site energy recovery is applied to any waste stream containing the toxic chemical or chemical category.

Energy Recovery Methods [enter 3-character code(s)]

1 ☐ 2 ☐ 3 ☐ 4 ☐

SECTION 7C. ON-SITE RECYCLING PROCESSES

☐ Not Applicable (NA) - Check here if no on-site recycling is applied to any waste stream containing the toxic chemical or chemical category.

Recycling Methods [enter 3-character code(s)]

1. ☐ 2. ☐ 3. ☐ 4. ☐ 5. ☐

6. ☐ 7. ☐ 8. ☐ 9. ☐ 10. ☐

SECTION 8. SOURCE REDUCTION AND RECYCLING ACTIVITIES

		Column A Prior Year (pounds/year*)	Column B Current Reporting Year (pounds/year*)	Column C Following Year (pounds/year*)	Column D Second Following Year (pounds/year*)
8.1	Quantity released ***				
8.2	Quantity used for energy recovery onsite				
8.3	Quantity used for energy recovery offsite				
8.4	Quantity recycled onsite				
8.5	Quantity recycled offsite				
8.6	Quantity treated onsite				
8.7	Quantity treated offsite				
8.8	Quantity released to the environment as a result of remedial actions, catastrophic events, or one-time events not associated with production processes (pounds/year)				
8.9	Production ratio or activity index				

8.10	Did your facility engage in any source reduction activities for this chemical during the reporting year? If not, enter "NA" in Section 8.10 1 and answer Section 8.11.			
	Source Reduction Activities [enter code(s)]	Methods to Identify Activity (enter codes)		
8.10.1		a.	b.	c.
8.10.2		a.	b.	c.
8.10.3		a.	b.	c.
8.10.4		a.	b.	c.
8.11	Is additional information on source reduction, recycling, or pollution control activities included with this report ? (Check one box)			YES ☐ NO ☐

* For Dioxin or Dioxin-like compounds, report in grams/year

*** Report releases pursuant to EPCRA Section 329(8) including "any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment." Do not include any quantity treated onsite.

(IMPORTANT: Type or print; read instructions before completing form)

United States Environmental Protection Agency

TOXIC CHEMICAL RELEASE INVENTORY
FORM A

WHERE TO SEND COMPLETED FORMS: 1. EPCRA Reporting Center, P.O Box 3348, Merrifield, VA 22116-3348, ATTN TOXIC CHEMICAL RELEASE INVENTORY 2. APPROPRIATE STATE OFFICE (See instructions in Appendix F)

Enter "X" here if this is a revision

For EPA use only

Important: See instructions to determine when "Not Applicable (NA)" boxes should be checked.

PART I. FACILITY IDENTIFICATION INFORMATION

SECTION 1. REPORTING YEAR _____

SECTION 2. TRADE SECRET INFORMATION

2.1	Are you claiming the toxic chemical identified on page 2 trade secret? ☐ Yes (Answer question 2.2, Attach substantiation forms) ☐ No (Do not answer 2.2, Go to Section 3)	2.2	Is this copy ☐ Sanitized ☐ Unsanitized (Answer only if "YES" in 2 1)

SECTION 3. CERTIFICATION (Important: Read and sign after completing all form sections.)

I hereby certify that to the best of my knowledge and belief, for each toxic chemical listed in the statement, the annual reportable amount as defined in 40 CFR 372 27 (a), did not exceed 500 pounds for this reporting year and that the chemical was manufactured, processed, or otherwise used in an amount not exceeding 1 million pounds during this reporting year.

Name and official title of owner/operator or senior management official	Signature	Date Signed:

SECTION 4. FACILITY IDENTIFICATION

4.1		TRI Facility ID Number	
Facility or Establishment Name		Facility or Establishment Name or Mailing Address(if different from street address)	
Street		Mailing Address	
City/County/State/Zip Code		City/State/Zip Code	Country (Non-US)

4.2	This report contains information for. (Important check c or d if applicable)	c ☐ A Federal facility	d ☐ GOCO
4.3	Technical Contact Name		Telephone Number (include area code)
4.4	Intentionally left blank		

4.5	SIC Code (s) (4 digits)	Primary a.	b.	c.	d.	e.	f.

4.6	Latitude	Degrees	Minutes	Seconds	Longitude	Degrees	Minutes	Seconds

4.7	Dun & Bradstreet Number(s) (9 digits)	4.8	EPA Identification Number (RCRA I.D No) (12 characters)	4.9	Facility NPDES Permit Number(s) (9 characters)	4.10	Underground Injection Well Code (UIC) I.D Number(s) (12 digits)
a.		a.		a.		a.	
b.		b.		b.		b.	

SECTION 5. PARENT COMPANY INFORMATION

5.1	Name of Parent Company	NA ☐	
5.2	Parent Company's Dun & Bradstreet Number	NA ☐	

IMPORTANT Type or print; read instructions before completing form

EPA FORM A

PART II. CHEMICAL IDENTIFICATION TRIFID:

Do not use this form for reporting PBT chemicals including Dioxin and Dioxin-like Compounds*

SECTION 1. TOXIC CHEMICAL IDENTITY Report ___ of ___

1.1	CAS Number (Important· Enter only one number exactly as it appears on the Section 313 list Enter category code if reporting a chemical category)
1.2	Toxic Chemical or Chemical Category Name (Important Enter only one name exactly as it appears on the Section 313 list)
1.3	Generic Chemical Name (Important. Complete only if Part 1, Section 2.1 is checked "yes" Generic Name must be structurally descriptive)

SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above.)

2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.)

SECTION 1. TOXIC CHEMICAL IDENTITY Report ___ of ___

1.1	CAS Number (Important Enter only one number exactly as it appears on the Section 313 list Enter category code if reporting a chemical category)
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.)
1.3	Generic Chemical Name (Important Complete only if Part 1, Section 2.1 is checked "yes" Generic Name must be structurally descriptive)

SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above.)

2.1	Generic Chemical Name Provided by Supplier (Important Maximum of 70 characters, including numbers, letters, spaces, and punctuation)

SECTION 1. TOXIC CHEMICAL IDENTITY Report ___ of ___

1.1	CAS Number (Important Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.)
1.2	Toxic Chemical or Chemical Category Name (Important. Enter only one name exactly as it appears on the Section 313 list.)
1.3	Generic Chemical Name (Important· Complete only if Part 1, Section 2 1 is checked "yes". Generic Name must be structurally descriptive.)

SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above.)

2.1	Generic Chemical Name Provided by Supplier (Important Maximum of 70 characters, including numbers, letters, spaces, and punctuation)

SECTION 1. TOXIC CHEMICAL IDENTITY Report ___ of ___

1.1	CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list Enter category code if reporting a chemical category)
1.2	Toxic Chemical or Chemical Category Name (Important Enter only one name exactly as it appears on the Section 313 list)
1.3	Generic Chemical Name (Important Complete only if Part 1, Section 2 1 is checked "yes" Generic Name must be structurally descriptive)

SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above.)

2.1	Generic Chemical Name Provided by Supplier (Important Maximum of 70 characters, including numbers, letters, spaces, and punctuation)

* See the TRI Reporting Forms and Instructions Manual for the list of PBT Chemicals (including Dioxin and Dioxin-like Compounds)

(Make additional copies of this page, if needed)

Appendix G

Long-term Trends by Industry, 1988-2001

Table G-1: TRI Total Releases, by Industry, 1995 and 1998-2001

SIC Code Industry	Total Releases On- and Off-site							
	1995	1998	2000	2001	Change 2000-2001		Change 1995-2001	
	Pounds	Pounds	Pounds	Pounds	Pounds	Percent	Pounds	Percent
20 Food	126,032,013	133,528,619	129,487,938	124,869,382	-4,618,557	-3.6	-1,162,632	-0 9
21 Tobacco	2,142,358	3,618,629	3,149,255	3,555,777	406,522	12 9	1,413,419	66 0
22 Textiles	18,777,991	12,099,716	8,196,293	6,876,767	-1,319,526	-16.1	-11,901,224	-63.4
23 Apparel	1,355,583	602,859	565,353	401,151	-164,202	-29 0	-954,432	-70 4
24 Lumber	36,153,353	35,389,103	34,578,288	31,357,541	-3,220,747	-9.3	-4,795,812	-13 3
25 Furniture	42,659,519	17,308,841	12,326,031	7,995,593	-4,330,438	-35 1	-34,663,926	-81 3
26 Paper	241,465,911	232,746,501	227,043,504	194,645,017	-32,398,488	-14.3	-46,820,894	-19.4
27 Printing	31,360,959	22,525,999	19,006,267	19,683,174	676,907	3.6	-11,677,785	-37 2
28 Chemicals	828,847,339	723,476,600	665,397,062	564,960,174	-100,436,889	-15.1	-263,887,165	-31 8
29 Petroleum	66,502,911	163,660,407	73,669,417	70,370,453	-3,298,964	-4 5	3,867,542	5 8
30 Plastics	128,027,753	112,662,561	107,195,780	88,132,838	-19,062,942	-17.8	-39,894,915	-31.2
31 Leather	4,851,489	4,835,113	3,624,907	2,614,654	-1,010,252	-27.9	-2,236,835	-46 1
32 Stone/Clay/Glass	34,095,325	42,205,191	41,452,102	38,215,324	-3,236,778	-7.8	4,119,999	12 1
33 Primary Metals	538,343,447	675,476,785	631,803,145	568,790,649	-63,012,496	-10 0	30,447,202	5 7
34 Fabricated Metals	106,850,683	87,657,361	77,758,739	64,720,754	-13,037,985	-16.8	-42,129,929	-39.4
35 Machinery	27,852,782	21,493,635	19,457,233	15,351,790	-4,105,444	-21 1	-12,500,992	-44 9
36 Electrical Equip	43,805,911	32,155,505	32,865,733	22,924,099	-9,941,634	-30.2	-20,881,812	-47.7
37 Transportation Equip.	123,377,260	102,859,926	96,805,488	80,400,734	-16,404,754	-16 9	-42,976,526	-34 8
38 Measure/Photo.	17,687,028	12,432,259	9,367,249	9,352,391	-14,858	-0.2	-8,334,637	-47.1
39 Miscellaneous	13,964,668	10,450,873	8,882,545	8,448,809	-433,736	-4.9	-5,515,859	-39 5
-- Multiple codes 20-39	157,610,046	127,980,605	125,125,172	103,012,317	-22,112,855	-17.7	-54,597,729	-34.6
-- No codes 20-39	15,380,962	6,486,370	8,496,634	11,347,431	2,850,797	33 6	-4,033,531	-26 2
Total	**2,607,145,291**	**2,581,653,456**	**2,336,254,137**	**2,038,026,819**	**-298,227,318**	**-12.8**	**-569,118,472**	**-21.8**

Note: Does not include delisted chemicals, 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 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

Table G-2: TRI Total Releases, by Industry, 1988 and 1998-2001

SIC Code Industry	Total Releases On- and Off-site							
	1988	1998	2000	2001	Change 2000-2001		Change 1988-2001	
	Pounds	Pounds	Pounds	Pounds	Pounds	Percent	Pounds	Percent
20 Food	6,933,694	14,194,881	9,837,644	8,941,407	-896,237	-9 1	2,007,713	29.0
21 Tobacco	214,464	185,062	76,013	74,354	-1,659	-2 2	-140,110	-65.3
22 Textiles	36,764,515	10,256,225	6,827,098	5,761,962	-1,065,136	-15.6	-31,002,553	-84.3
23 Apparel	951,662	385,976	282,189	229,131	-53,058	-18 8	-722,531	-75 9
24 Lumber	32,846,908	32,405,698	31,725,202	29,674,357	-2,050,845	-6 5	-3,172,551	-9.7
25 Furniture	62,181,722	17,007,214	12,080,018	7,872,708	-4,207,310	-34.8	-54,309,014	-87.3
26 Paper	205,114,369	175,754,114	171,542,417	146,129,068	-25,413,349	-14 8	-58,985,301	-28 8
27 Printing	56,538,794	22,312,923	18,835,901	19,512,168	676,267	3 6	-37,026,626	-65 5
28 Chemicals	876,796,865	424,226,839	385,904,328	336,978,365	-48,925,962	-12.7	-539,818,500	-61.6
29 Petroleum	73,411,402	129,117,129	35,260,219	31,621,986	-3,638,233	-10 3	-41,789,416	-56 9
30 Plastics	159,936,426	100,204,129	96,581,791	77,206,667	-19,375,123	-20.1	-82,729,758	-51 7
31 Leather	10,089,020	4,266,247	3,046,595	2,190,120	-856,474	-28.1	-7,898,900	-78 3
32 Stone/Clay/Glass	34,895,576	25,851,605	24,921,652	21,861,352	-3,060,300	-12 3	-13,034,224	-37.4
33 Primary Metals	605,145,767	589,995,378	540,369,135	503,701,622	-36,667,513	-6 8	-101,444,145	-16 8
34 Fabricated Metals	158,298,387	80,312,301	70,223,065	57,444,004	-12,779,061	-18.2	-100,854,383	-63.7
35 Machinery	70,743,712	18,139,545	16,966,425	12,908,551	-4,057,875	-23 9	-57,835,161	-81 8
36 Electrical Equip.	124,982,923	22,540,946	21,945,322	15,607,773	-6,337,549	-28.9	-109,375,150	-87.5
37 Transportation Equip	212,008,391	96,637,404	90,499,953	74,712,175	-15,787,778	-17 4	-137,296,216	-64 8
38 Measure/Photo	56,609,556	6,921,581	4,495,093	3,814,878	-680,215	-15.1	-52,794,678	-93.3
39 Miscellaneous	31,771,975	10,017,639	8,134,512	7,391,328	-743,184	-9 1	-24,380,647	-76 7
-- Multiple codes 20-39	299,429,463	87,847,472	83,237,145	63,525,143	-19,712,002	-23.7	-235,904,320	-78.8
-- No codes 20-39	38,064,082	4,388,781	6,251,253	8,565,124	2,313,871	37 0	-29,498,958	-77 5
Total	**3,153,729,673**	**1,872,969,088**	**1,639,042,971**	**1,435,724,244**	**-203,318,727**	**-12.4**	**-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

Table G-3: Total Production-related Waste Managed, by Industry, 1995 and 1998-2001

SIC Code Industry	Total Production-related Waste Managed							
	1995	1998	2000	2001	Change 2000-2001		Change 1995-2001	
	Pounds	Pounds	Pounds	Pounds	Pounds	Percent	Pounds	Percent
20 Food	4,138,020,080	1,089,073,581	600,427,195	1,088,676,460	488,249,265	81 3	-3,049,343,620	-73.7
21 Tobacco	3,061,366	5,907,399	5,300,257	5,302,236	1,979	0 0	2,240,870	73 2
22 Textiles	54,968,221	49,293,935	44,062,732	40,578,139	-3,484,593	-7.9	-14,390,082	-26.2
23 Apparel	2,229,053	1,920,919	1,895,870	1,803,385	-92,485	-4 9	-425,668	-19 1
24 Lumber	112,549,987	63,493,916	175,413,059	68,470,249	-106,942,811	-61.0	-44,079,738	-39.2
25 Furniture	60,744,336	32,957,866	23,968,255	14,997,034	-8,971,221	-37 4	-45,747,302	-75 3
26 Paper	1,758,766,585	1,476,450,418	1,479,788,509	1,373,244,775	-106,543,734	-7 2	-385,521,810	-21 9
27 Printing	294,975,082	300,646,333	365,351,767	370,475,455	5,123,688	1 4	75,500,373	25 6
28 Chemicals	9,467,127,337	10,336,213,842	15,724,070,676	10,660,684,644	-5,063,386,032	-32.2	1,193,557,307	12 6
29 Petroleum	946,477,071	1,053,354,400	830,433,364	874,957,447	44,524,083	5 4	-71,519,624	-7 6
30 Plastics	294,749,986	260,807,868	225,897,970	203,876,026	-22,021,944	-9.7	-90,873,960	-30.8
31 Leather	10,331,453	10,760,483	17,972,644	8,406,552	-9,566,092	-53 2	-1,924,901	-18 6
32 Stone/Clay/Glass	765,400,195	696,976,031	616,620,095	566,829,148	-49,790,947	-8.1	-198,571,047	-25.9
33 Primary Metals	3,721,854,285	3,081,686,210	3,509,833,346	2,651,415,299	-858,418,048	-24 5	-1,070,438,986	-28 8
34 Fabricated Metals	748,699,390	708,983,457	719,061,580	648,357,622	-70,703,959	-9 8	-100,341,768	-13 4
35 Machinery	169,626,199	148,537,242	139,943,299	127,291,913	-12,651,386	-9 0	-42,334,286	-25 0
36 Electrical Equip.	361,864,284	410,723,885	405,106,370	309,059,826	-96,046,544	-23.7	-52,804,458	-14 6
37 Transportation Equip	389,872,292	302,423,453	282,620,688	253,088,358	-29,532,330	-10 4	-136,783,934	-35 1
38 Measure/Photo	79,195,911	75,104,565	69,278,227	61,971,990	-7,306,236	-10.5	-17,223,921	-21.7
39 Miscellaneous	52,221,619	50,848,238	42,595,503	40,644,907	-1,950,597	-4 6	-11,576,712	-22 2
-- Multiple codes 20-39	1,788,072,315	1,074,551,644	1,343,644,331	943,612,660	-400,031,672	-29 8	-844,459,655	-47.2
-- No codes 20-39	114,614,139	30,712,834	24,814,899	23,947,941	-866,957	-3 5	-90,666,198	-79 1
Total	**25,335,421,186**	**21,261,428,518**	**26,648,100,637**	**20,337,692,065**	**-6,310,408,572**	**-23.7**	**-4,997,729,120**	**-19.7**

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

Table G-4: Total Production-related Waste Managed, by Industry, 1991 and 1998-2001

SIC Code Industry	Total Production-related Waste Managed							
	1991	1998	2000	2001	Change 2000-2001		Change 1991-2001	
	Pounds	Pounds	Pounds	Pounds	Pounds	Percent	Pounds	Percent
20 Food	32,999,426	73,607,746	65,798,548	72,996,697	7,198,149	10.9	39,997,271	121.2
21 Tobacco	51,388,971	203,097	121,856	103,195	-18,661	-15 3	-51,285,776	-99 8
22 Textiles	46,359,366	42,526,821	37,322,037	35,396,289	-1,925,748	-5.2	-10,963,077	-23.6
23 Apparel	2,284,755	1,632,284	1,538,261	1,565,857	27,596	1 8	-718,898	-31 5
24 Lumber	59,908,971	60,850,126	172,704,607	66,536,320	-106,168,288	-61.5	6,627,349	11.1
25 Furniture	61,313,913	32,475,514	23,594,010	14,786,786	-8,807,224	-37 3	-46,527,127	-75 9
26 Paper	1,381,495,014	1,279,180,742	1,289,804,351	1,211,621,393	-78,182,958	-6.1	-169,873,621	-12.3
27 Printing	258,845,384	299,333,836	363,317,375	368,224,419	4,907,044	1 4	109,379,035	42 3
28 Chemicals	6,848,386,194	8,422,199,877	12,908,489,174	8,756,222,262	-4,152,266,911	-32.2	1,907,836,068	27.9
29 Petroleum	1,165,844,926	862,852,090	630,596,947	593,939,915	-36,657,032	-5 8	-571,905,011	-49 1
30 Plastics	290,503,492	233,325,331	200,476,299	180,193,050	-20,283,249	-10.1	-110,310,442	-38.0
31 Leather	17,878,399	6,361,954	14,134,988	5,053,010	-9,081,978	-64 3	-12,825,389	-71 7
32 Stone/Clay/Glass	928,431,948	658,764,212	565,166,558	517,518,547	-47,648,011	-8.4	-410,913,401	-44.3
33 Primary Metals	1,938,982,427	2,734,557,510	3,147,763,417	2,469,444,307	-678,319,111	-21.5	530,461,880	27 4
34 Fabricated Metals	570,540,457	665,922,843	676,419,737	610,328,287	-66,091,450	-9 8	39,787,830	7.0
35 Machinery	260,696,519	136,593,162	130,269,191	118,545,022	-11,724,169	-9 0	-142,151,497	-54 5
36 Electrical Equip	343,323,963	306,990,047	322,048,768	250,279,959	-71,768,809	-22.3	-93,044,004	-27.1
37 Transportation Equip	368,381,654	281,389,447	264,568,161	235,741,996	-28,826,165	-10 9	-132,639,658	-36.0
38 Measure/Photo.	116,026,519	63,075,456	58,564,000	51,943,157	-6,620,842	-11.3	-64,083,362	-55.2
39 Miscellaneous	62,851,466	47,938,464	40,034,731	37,927,656	-2,107,076	-5 3	-24,923,810	-39 7
-- Multiple codes 20-39	1,764,107,429	865,008,134	1,172,369,511	773,994,968	-398,374,544	-34.0	-990,112,461	-56.1
-- No codes 20-39	202,796,311	25,477,481	19,593,336	17,177,901	-2,415,435	-12 3	-185,618,410	-91 5
Total	**16,773,347,504**	**17,100,266,173**	**22,104,695,864**	**16,389,540,994**	**-5,715,154,870**	**-25.9**	**-383,806,511**	**-2.3**

Note: Does not include delisted chemicals, chemicals added in 1994 and 1995, ammonia, hydrochloric acid, PBT chemicals, sulfuric acid, vanadium and vanadium compounds 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 Data are from Section 8 of Form R of year indicated